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Report to the Chairman, Subcommittee on Readiness, Committee on Armed Services, House of Representatives

July 1992

AIR FORCE ADP

Status of Logistics Modernization Projects and CIM Impacts

GAO/IMTEC-92-66

GAO

United States
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Information Management and Technology Division

B-249085

July 30, 1992

The Honorable Earl Hutto
Chairman, Subcommittee on Readiness
Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

In July 1991, you requested that we provide you with information on the Air Force Materiel Command's (formerly the Air Force Logistics Command) 14 major logistics system modernization projects and what impact the Department of Defense's Corporate Information Management (CIM) initiative has had on these projects. Defense initiated CIM in 1989 to improve business operations in functional areas, including logistics. CIM should result in the consolidation of redundant information systems across the Department. This request was precipitated by your general concern over the millions of dollars being spent to modernize Air Force information systems. Specifically, you asked that we provide information on (1) the status of the 14 modernization projects, (2) whether the Air Force has evaluated any benefits derived from delivered systems, and (3) what impact CIM is having on the systems still under development. Appendix I details our objectives, scope, and methodology.

Results in Brief

Since the early 1980s, the Air Force Materiel Command has spent about $1 billion on its modernization effort to replace 108 outdated logistics systems with 14 new ones. Of these 14, according to the Air Force, 6 are still under development, 1 has been canceled, and 7 have been delivered. We did not assess whether the delivered systems were cost effective. However, we previously reported that one system, delivered in 1987 at a cost of $21 million—$8.9 million below estimate—was ineffective and should be discontinued.[1]

The Air Force itself has not thoroughly evaluated the benefits of any of the delivered systems and will have difficulty doing so because it has not established adequate performance measures. Further, Defense has not yet completed the analyses needed to evaluate ongoing logistics systems,

[1]Air Force ADP: Millions Can Be Saved If Automated Technical Order System Is Discontinued (GAO/IMTEC-90-72, Aug. 23, 1990).

select the most promising, and curtail the others. These analyses must be completed before Defense can determine if CIM will have an impact on the modernization projects.

Background

The Air Force Materiel Command supplies spare parts and provides depot maintenance to keep Air Force units and weapons systems in a state of readiness. The Command has long relied on automated information systems to provide the enormous amount of timely and accurate information needed to accomplish its mission. However, most of the Command's nearly 385 logistics information systems were designed in the late 1950s and early 1960s. While these systems have been improved since their implementation, they have not kept pace with increasing information needs and technical advances. Therefore, in the early 1980s, the Air Force Materiel Command initiated a modernization and consolidation effort of its major information systems.

To begin meeting this challenge, the Command initiated 14 major information system projects to modernize and consolidate portions of its core logistics functions—requirements, acquisition, distribution, and maintenance. The Command expects to spend about $1.2 billion to deliver these systems by September 1994. Fully operational, the 14 new systems were to replace 108 outdated systems, provide numerous readiness and logistics support improvements, and return nearly $2.5 billion in savings.

In late 1989, the Department of Defense initiated CIM to improve business processes in functional areas, including logistics. A stated goal of CIM is to eliminate unnecessarily redundant and ineffective information systems Defense-wide. Defense recognized that its ways of doing business had changed little and that the automated information systems of the 1980s were nothing more than upgrades of systems of the 1960s. It also recognized that although each military service had systems similar in function, with limited exceptions, these systems were not standard among services and, in some cases, not standard within the same service. Defense estimated that CIM would save about $36 billion by the end of fiscal year 1997 by improving business processes and standardizing information management and technology. Under CIM, the services are not to spend funds to develop and maintain multiple systems to meet the same functional requirements.

Status of Modernization Projects

As of March 1992, the Air Force Materiel Command had spent about $1 billion to modernize and consolidate its logistics management systems. According to Air Force documentation, 7 of the 14 systems have been delivered at a cost of $261 million. These systems are as follows: the Automated Technical Order System, Central Procurement Accounting System, Engineering Data Computer Assisted Retrieval System, Enhanced Transportation Automated Data System, Intersite Gateway, Local Area Network, and Weapon Systems Management Information System. We did not assess how well these systems are operating and, therefore, cannot say whether they are cost effective. Appendix II provides a system description and summarizes key status information on each of these delivered projects.

Six systems are still under development; these are the Air Force Equipment Maintenance System, Contract Data Management System, Depot Maintenance Management Information System, Reliability and Maintainability Information System, Requirements Data Bank, and Stock Control and Distribution System. A fourteenth system, the Joint Uniform Services Technical Information System, was terminated in its design phase. According to the Air Force, the Stock Control and Distribution System will be fully deployed sometime this summer at cost and slightly under schedule. This is not the case for the other five systems. According to Air Force documentation, the five are reaching their respective cost and schedule estimates, while their operational capabilities range from 0 to 52 percent. The Air Force based these percentages on various factors such as the ratio of lines of code written to projected lines of code or the program manager's estimate of project completion and may not represent the actual amount of work done on a project or how close the project is to completion. According to Air Force Materiel Command officials, there is no recommended standard methodology for calculating the percentage of completion for information systems under development.

Of the estimated $964 million needed to deliver the six systems, only $189.2 million has not been obligated. Appendix III provides a system description and summarizes key status information on the six projects still under development.

Full Benefits of Delivered Modernization Projects Unknown

In May 1987, we reported that the Command had not stated the expected benefits of modernization projects in sufficient detail to establish criteria to measure successful project completion.[2] Two years later, we reported that the Command had not prepared evaluation plans for most of the modernization projects.[3] These plans were to be established early in the development process to ensure that data-gathering or benefit-tracking mechanisms were implemented to measure operational effectiveness before and after a new system became operational.

As of March 1992, the Command had attempted to evaluate the derived benefits of four of the seven delivered logistics information systems. While the Air Force uses these evaluations to support its position that these new systems provide benefits, they do not accurately measure the savings achieved and the extent of improvements made. For example, in 1982, the Command initiated the Automated Technical Order System to automatically manage technical orders to increase timeliness and accuracy. The system was delivered in March 1987. However, in 1990, we reported that the Automated Technical Order System was not cost effective and should be discontinued.[4] Despite this recommendation, the Air Force continued to use the system. However, the Command's September 1991 evaluation indicated that full system benefits could not be measured because of incomplete information. According to the Command, no accurate records exist that show how long it takes to make technical order changes. Similarly, annual and recurring cost savings from using the new system could not be quantified because detailed information needed to determine the cost per page was not available.

The Command has not completed evaluations of the remaining three delivered systems' derived benefits. As of March 1992, evaluations were underway for two of the systems—the Enhanced Transportation Automated Data System and the Weapon System Management Information System. The Command expects these evaluations to be completed in July 1992 and October 1993, respectively. However, the Command has not yet evaluated the Engineering Data Computer Assisted Retrieval System—a system the Air Force designated in October 1987 as being fully operational. In 1989,

[2]Air Force Computers: Development Risks of Logistics Modernization Program Can Be Reduced (GAO/IMTEC-87-19, May 15, 1987).

[3]Air Force ADP: Evaluations Needed to Substantiate Modernization Program Benefits (GAO/IMTEC-89-29, May 5, 1989).

[4]GAO/IMTEC-90-72, Aug. 23, 1990

we questioned whether the Command should be reporting this project as having full operational capability when the loading of 5 million active engineering data records had been delayed.[5] Currently, according to the official who will eventually conduct the evaluation, the Air Force has only loaded 65 percent of the necessary data. We continue to question how the Air Force can call this system fully operational. Further, this official stated that a full benefits analysis will be performed, but a date for the analysis has not been set.

CIM Has Had Little Impact on Modernization Projects

So far, CIM has had little impact on the Command's modernization projects. While some of the Command's ongoing modernization projects have been combined with systems in other services, Defense has been slow to conduct analyses needed to determine if additional project consolidation is warranted.

In 1991, Defense redirected two of the Command's seven ongoing logistics modernization projects, the Contract Data Management System project and the Joint Uniform Services Technical Information System project. In the first case, in February 1991, the Air Force transferred primary development responsibility for three of the Contract Data Management System project's five subsystems to the Navy. The Command estimated that this redirection will reduce its project costs by about $5 million but will extend the development schedule about 3 years. In the second case, after a Defense assessment of its redundancy with an Army project, the Air Force terminated the Joint Uniform Services Technical Information System project in September 1991. The Air Force estimated that the system would have cost about $800 million to develop, operate, and maintain over its useful life.

In addition to redirecting selected projects, Defense has taken several other steps in its attempt to implement CIM. For example, the Director of Defense Information directed that no ongoing project would receive fiscal year 1992 funding unless it was justified by a detailed functional business analysis. These business analyses were intended to clearly demonstrate how a proposed system would improve operations and save money within a functional area, such as logistics. Defense was then to use these analyses to evaluate the military services' ongoing projects, select the most promising systems, and curtail the others. The Air Force did not perform detailed

[5]GAO/IMTEC-89-29, May 5, 1989.

functional business analyses for the logistics area. In lieu of the functional business analyses, the Air Force submitted existing cost-benefit analyses originally used to justify the initiation of the respective modernization projects. Defense allowed the Command to obligate 1992 funds for its ongoing systems based on these cost-benefit analyses.

In March 1992, Defense created the Joint Logistics Systems Center to analyze, streamline, and standardize Defense's logistics processes, and to manage the design, development, implementation, and maintenance of standard computer systems to support these processes. The Center's responsibilities include analyzing business activities, supporting information technology, identifying alternative systems to perform the same functions, and distributing funds for logistics projects. Because the Center has been operational only since March, analyses are just beginning. Once completed, the Center plans to use these analyses to determine how and if ongoing modernization projects should be modified. Until this time, however, services may be spending money to develop systems that are ineffective or duplicative.

Observations

To date the Command has not been able to fully or accurately quantify cost savings and operational improvements achieved—actions that are imperative to the success of CIM. As a result, the Command has neither the criteria nor the data needed to fully measure benefits provided by its new logistics management systems.

As Defense implements CIM, it can learn valuable lessons from the Air Force's experience in modernizing its systems. The modernization projects demonstrate the critical need to establish adequate measures of performance. Without such measures, Defense does not have a valid basis for determining how a proposed system will improve business operations, assessing the relative merits of system alternatives, or evaluating the benefits derived from completed systems. Defense has made the establishment of performance measures the cornerstone of CIM. It is important that Defense not lose sight of this as it continues to implement CIM.

We conducted our review from August 1991 to June 1992, in accordance with generally accepted government auditing standards. As requested, we did not provide a draft of this report to the Department of Defense for its review and comment. Instead, we discussed the report's facts with officials, including the Vice Commander of the Joint Logistics Command, who generally agreed with the facts as presented. We have incorporated their views in the report as appropriate. We plan no further distribution of this report until 30 days from the date of this letter. We will then send copies to the Secretary of Defense, the Secretary of the Air Force, and other interested parties. Copies will also be made available to others upon request. Should you have any questions concerning this report, please contact me at (202) 512-6240. Major contributors to this report are listed in appendix IV.

Sincerely yours,

Samuel W. Bowlin
Director, Defense and Security
Information Systems

Contents

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Abbreviations

ADP	automated data processing
CIM	Corporate Information Management
GAO	General Accounting Office
IMTEC	Information Management and Technology Division

Objectives, Scope, and Methodology

In July 1991, the Chairman, Subcommittee on Readiness, House Committee on Armed Services, expressed concern over the millions of dollars being spent on the Air Force Materiel Command's 14 modernization projects. Therefore, we agreed to provide information on (1) the status of the 14 systems, (2) whether the Air Force has evaluated any benefits derived from delivered systems, and (3) what impact CIM is having on the ones still under development.

To obtain project status information, we reviewed key documentation, including Logistics Management Systems Quarterly Major Automated Information Systems Status Reports (March 1991 through March 1992), Logistics Management Systems Program Information Matrix, and the Command's November 1991 brochure on the Logistics Management Systems. Additional status, budget, and funding information was obtained from individual project managers, program analysts, and financial managers. We did not independently assess the validity of this information.

To determine if the Command had derived benefits from its delivered systems, we reviewed final operational evaluations completed by the Command and interviewed responsible evaluation officials for any additional information. To determine the impact CIM is having on the systems still under development, we interviewed Command officials and reviewed the Command's modernization projects' business analyses required for fiscal year 1992 funding. We interviewed Defense and Command officials to determine how these analyses were to be used in making funding decisions. Finally, we reviewed key CIM documentation that described CIM objectives and the Joint Logistics Systems Command's mission.

Our review was conducted from August 1991 through June 1992 at the Department of the Air Force, Washington D.C., and the Air Force Materiel Command and the Joint Logistics Systems Center, Wright-Patterson Air Force Base, Ohio.

ummary Information on Delivered Logistics lanagement Systems

atus of Delivered ystems

Table II.1 summarizes cost and schedule information on the 7 delivered system. Detailed information on each system follows.

ble II.1 Cost and Schedule of Delivered Systems

tem	Estimated acquisition cost (millions)	Actual acquisition cost (millions)	Estimated delivery date	Reported delivery date[a]
omated Technical Order System	$30.6	$21.7	Mar. 1987	Mar. 1987
tral Procurement Accounting System	11.7	14.2	July 1989	Aug. 1989
ineering Data Computer Assisted etrieval System	35.0	29.5	Feb. 1987	Oct. 1987
anced Transportation Automated ata System	5.5	13.4	Dec. 1986	June 1991
rsite Gateway System	22.0	15.3	Dec. 1987	June 1989
al Area Network	161.4	122.7	July 1990	Mar. 1990
apon System Management formation System	48.7	44.2	Sep. 1987	Sep. 1987
als	**$314.9**	**$261.0**		

[a]These data are based on Air Force documentation and do not mean that the systems are cost effective or that they necessarily perform as intended.

utomated Technical rder System

escription

This system automates the capture, storage, and maintenance of technical order data for maintenance, repair, inspection, and modification functions. Digital technical order data are obtained by converting contractor-prepared digital data or by scanning paper technical orders.

st and Schedule

This system was delivered in March 1987, and its acquisition cost was $21.7 million.

Evaluation of System Benefits

According to the Air Force, the Automated Technical Order System was delivered in 1987 below cost and on schedule; however, we reported in 1990 that the Air Force should discontinue the system because it was not cost effective.[1] Despite our recommendation, the Air Force continued to use the system. In September 1991, the Command completed its evaluation to measure the operational improvements and dollar savings provided by the system, which, according to Air Force officials, was expected to save $13 million. The evaluation showed that the system had not met its expectations to reduce the time needed to update and distribute a technical order from months to days and increase the accuracy of technical orders. According to the Air Force, these expectations were not met because (1) all data needed to operate the system had not been loaded, (2) staff positions had not been filled, and (3) sufficient training had not been received. The Air Force plans to use this system until a Defense standard system is developed under CIM.

Central Procurement Accounting System

Description

This information system provides managers with weapon system fund statuses, budget execution summaries, and foreign military sales data. It assists the Command's compliance with federal laws by alerting officials to possible over-obligations.

Cost and Schedule

This system was delivered in August 1989, and its acquisition cost was $14.2 million.

Evaluation of System Benefits

According to the Command, it evaluated the system's operational capabilities in 1990 and found that the system had met its expectations to reduce the time needed to input, report, and access financial information. The Command also stated that the system provides quick access to the balance of funds and improves the overall accuracy of accounting data. The Command estimated that these improvements result in a one-time savings of $50 million and an annual savings of $250,000.

[1]GAO/IMTEC-90-72, Aug. 23, 1990.

Engineering Data Computer Assisted Retrieval System

Description

This retrieval system automates the receipt, requisitioning, indexing, filing, retrieval, and distribution of engineering drawings. It is a paperless system for storing engineering drawings used for maintenance modification, engineering evaluation, and spare parts contracting.

Cost and Schedule

This system was delivered in October 1987, and its acquisition cost was $29.5 million.

Evaluation of System Benefits

As of April 1992, the Command had not evaluated the benefits of this system. According to the evaluation official, preparations are being made to conduct the evaluation, but a schedule has not yet been established. In 1989, we reported that the evaluation of the system had been postponed because of delays in loading the 5 million engineering data records the system was intended to automate.[2] At that time, the project director estimated that it could take as long as 6 years before expected benefits—more efficient spare parts procurement, reduced spare part shortages, and increased weapons system mission capable rates—are realized. Even though the system contains only about 65 percent of its data, Air Force officials contend that the Engineering Data Computer Assisted Retrieval System has reduced the time needed to distribute technical drawings from months to days.

[2]GAO/IMTEC-89-29, May 5, 1989.

Enhanced Transportation Automated Data System

Description

This system controls cargo distribution from shipment to final receipt. It supports transportation and financial functions with information on airlift, sealift, and scheduled truck service. By directly managing control over finances for transportation of material, the system helps ensure Air Force compliance with public law and Department of Defense directives.

Cost and Schedule

This system was delivered in June 1991, and its acquisition cost was $13.4 million.

Evaluation of System Benefits

The evaluation of the benefits of the Enhanced Transportation Automated Data System is scheduled for July 1992. However, Command officials state that benefits are already being realized. For example, according to these officials, the system allowed the Command to track transportation costs and payments during fiscal year 1991. This avoided double payments, saving the Air Force about $12 million. Additionally, financial information on the transport of materials is now available immediately rather than on a weekly or monthly basis.

Intersite Gateway System

Description

The gateway system supports intersite communications among Air Force headquarters, Air Force Materiel Command, and the five Air Logistics Centers. It provides on-line access for the Command's data systems to other networks, including the Defense Data Network and the Automated Digital Network.

Cost and Schedule

This system was delivered in June 1989, and its acquisition cost was $15.3 million.

Evaluation of System Benefits

In February 1990, the Command completed its evaluation and reported that the Intersite Gateway System met its expectations, allowing systems at different locations to share resources such as printers and data files. According to the Air Force, all of the system's connections, protocol, format, and data handling functions were correct. However, the evaluation does not quantify either monetary savings or operational improvements attributable to the new system. According to the official responsible for the system, other systems that communicate over the gateway receive cost savings and mission improvements, but these benefits cannot be quantified either.

Local Area Network

Description

Located at each major Air Force Materiel Command installation, the local area network provides computer-to-computer communications among different data systems at each site.

Cost and Schedule

The network was delivered in March 1990, and its acquisition cost was $122.7 million.

Evaluation of System Benefits

Because the Command did not identify the expected operational improvements or expected cost savings prior to receiving the network, the evaluation that was completed in June 1991 could not quantify any savings or improvements. However, according to the Air Force, the network meets and, in some cases, exceeds expectations by providing faster, higher-quality communications.

Weapon System Management Information System

Description

This system is an automated modeling tool for assessing the Air Force's capability to go to war. It computes wartime requirements, identifies logistics resources that limit combat capability, and determines corrective actions.

Cost and Schedule

This system was delivered in September 1987, and its acquisition cost was $44.2 million.

Evaluation of System Benefits

Although the Weapon System Management Information System has been operational for over 4 years, the Command has not evaluated the benefits of its operational capabilities. Originally, the Command had scheduled an evaluation late in fiscal year 1988. As we reported, this assessment was delayed while additional capabilities were being added.[3] These capabilities included (1) identifying peacetime supply problems in 7 or fewer days, (2) making sustainability assessments in 6 hours, and (3) allocating resources to maximize combat effectiveness. The Command expected these new capabilities to provide nearly $365 million in savings. Even though the evaluation will not be completed until October 1993, the Air Force contends it is receiving benefits from the system.

[3]GAO/IMTEC-89-29, May 5, 1989.

Summary Information on Logistics Management Systems Still Under Development

Status of Systems Still Under Development

Table III.1 depicts how the Air Force characterizes the percentage of system capability in relation to the percentage of cost and schedule already expended for each ongoing modernization project. According to Air Force Materiel Command officials, there is no recommended standard methodology for calculating the percentage of completion for information system development. These percentages were based on various factors, such as the ratio of lines of code written to projected lines of code or the program manager's estimate of project completion, and may not represent the actual amount of work completed on a project. Detailed information as of May 1992 on each system still under development follows.

Table III.1 Cost, Schedule, and Performance of Systems Still Under Development

System	Estimated acquisition cost (millions)	Cost obligated (percentage)	Estimated delivery date	Schedule expended (percentage)	Capabilities achieved (percentage)
Air Force Equipment Maintenance System	$78.2	78.3	Sep. 1993	59.1	0.0
Contract Data Management System	68.8	81.5	TBD[a]	73.3	46.0
Depot Maintenance Management System Information System	249.7	56.3	Mar. 1994	76.9	15.0
Reliability and Maintainability Information System	109.6	85.0	Apr. 1994	72.5	30.0
Requirements Data Bank System	239.2	80.2	Sep. 1994	76.6	52.0
Stock Control and Distribution System	219.1	106.0	June 1992	95.6	100.0[b]
Total	**$964.6**				

[a]The estimated delivery date for the Contract Data Management System may be revised under CIM.

[b]According to the Air Force, this system has attained full operational capability but is in the process of being delivered to users for maintenance responsibility.

Air Force Equipment Maintenance System

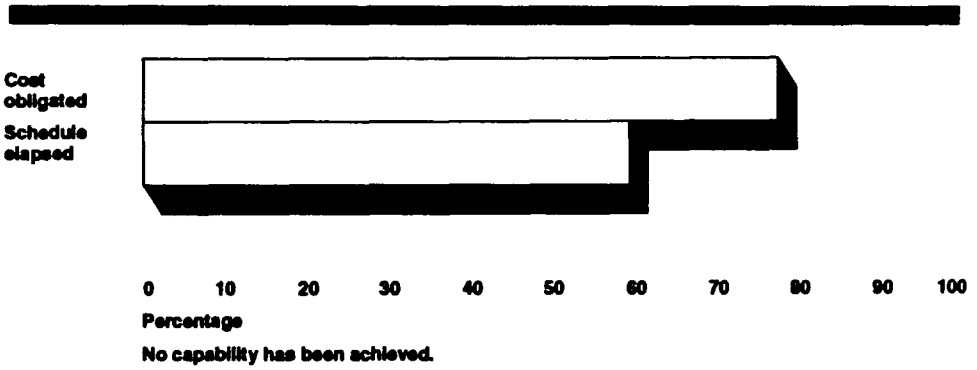
Description

This management system consolidates various Air Force equipment management systems with a single database management system. Its purpose is to help the Air Force get the right equipment to the right place at the right time to support the operation and maintenance of weapons systems.

Status

The Air Force estimates this system's acquisition to cost $78.2 million. The Air Force has expended $61.2 million, or 78.3 percent, of its estimated cost and 59.1 percent of its estimated schedule. According to Air Force officials, the Command will not estimate the percentage of operational capability until the system is delivered.

Figure III.1: Cost, Schedule, and Performance Status of Air Force Equipment Maintenance System



Contract Data Management System

Description

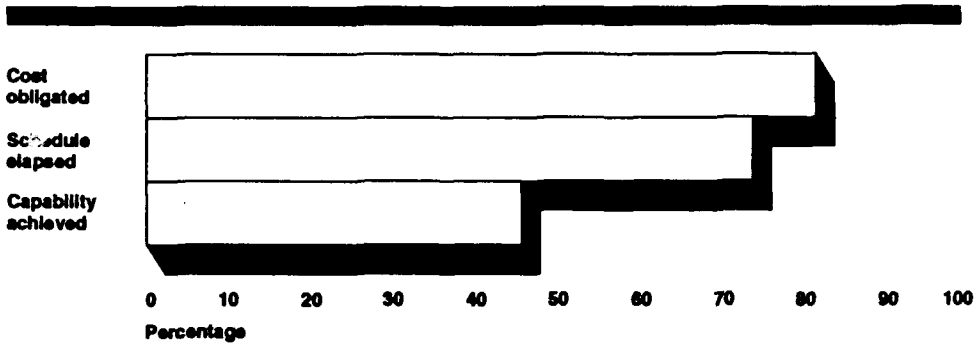
This system will manage contracting information by weapon system and automate the input of data from various sources. It will automate the contract production process, including the preparation of acquisition packages, requests for proposals, and contracts. Additional tasks will

include the preparation of purchase requests and contracts; price history; contract information; and accurate, on-line item delivery schedules.

Status

The Air Force estimates this system's acquisition to cost $68.8 million. The Air Force has expended $56.1 million, or 81.5 percent, of its estimated cost and 73.3 percent of its estimated schedule, while the system has 46 percent of its operational capability.

Figure III.2: Cost, Schedule, and Performance Status of Contract Data Management System



Depot Maintenance Management Information System

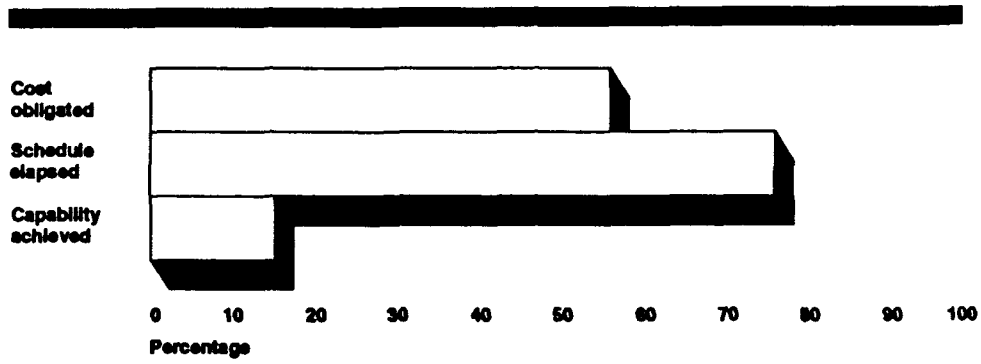
Description

This system is being developed to integrate the management of depot repair functions. It is to provide effective planning of all resources used by depot maintenance, including facilities, personnel, tools, equipment, and funds. It addresses a variety of functions such as long-range planning, production planning and scheduling, and material requirements planning. It is also to provide all users with on-line access to current maintenance management information.

Status

The Air Force estimates this system's acquisition to cost $249.7 million. The Air Force has expended $140.6 million, or 56.3 percent, of its estimated cost and 76.9 percent of its estimated schedule, while the system has 15 percent of its operational capability.

Figure III.3: Cost, Schedule, and Performance Status of Depot Maintenance Management Information System



Reliability and Maintainability Information System

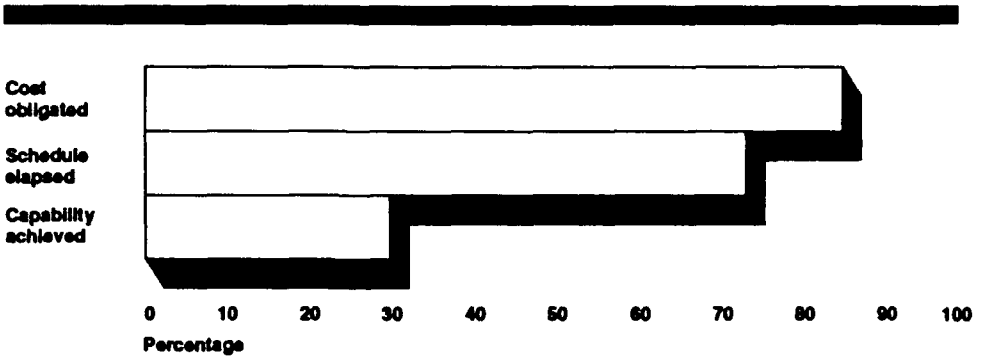
Description

This information system is designed to edit, process, and store status and utilization data. It is to be the primary Air Force repository of base, depot, and contractor maintenance and inspection information on weapons and equipment. It is to receive, process, store, and retrieve performance data needed to identify (1) equipment failures and suggest appropriate corrective action and (2) the level of operational capability.

Status

The Air Force estimates this system's acquisition to cost $109.6 million. The Air Force has expended $93.2 million, or 85 percent, of its estimated cost and 72.5 percent of its estimated schedule, while the system has 30 percent of its operational capability.

ure III.4: Cost, Schedule, and formance Status of Reliability and intainability Information System



equirements Data ank

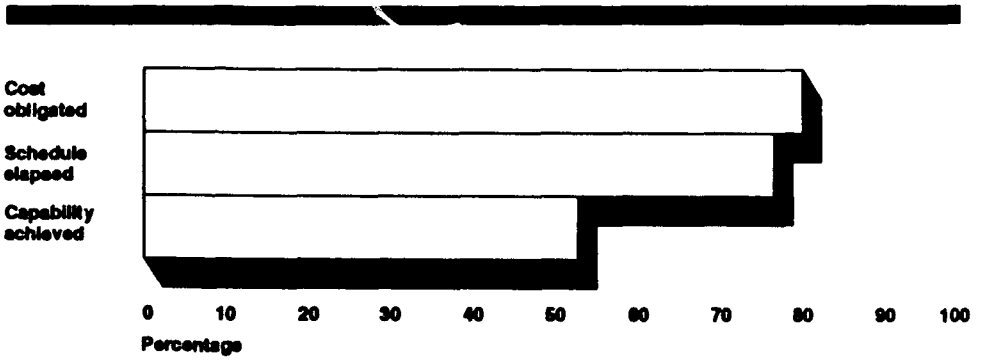
escription

This system is being developed to compute the material quantities and budgets needed to support weapon systems and other equipment. It also is to be used to compute worldwide requirements, budgets, and plans for spare and repair parts and equipment needs. This system is being designed to have the capability to simulate options or possible results through "what if" scenarios. These simulations are expected to provide Air Force managers with accurate readiness assessments and the impacts of these assessments.

atus

The Air Force estimates this system's acquisition to cost $239.2 million. The Air Force has expended $191.9 million, or 80.2 percent, of its estimated cost and 76.6 percent of its estimated schedule, while the system has 52 percent of its operational capability.

ure III.5: Cost, Schedule, and formance Status of Requirements a Bank



Stock Control and Distribution System

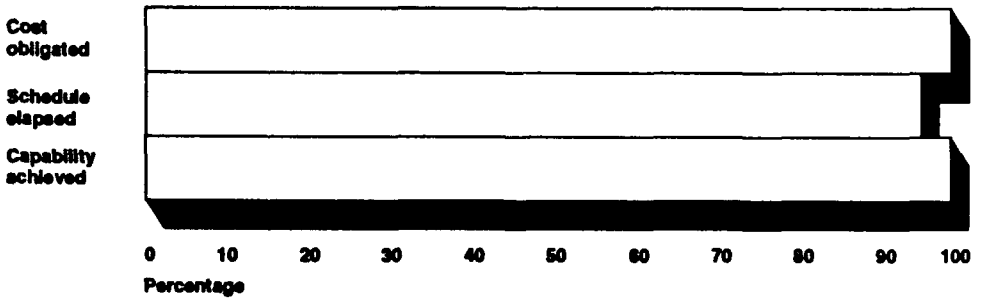
Description

This system is designed to reduce order and shipping time and provide managers with immediate access to current information by providing better control over the storage, allocation, and movement of materials to customers. The primary functions of the system are processing requisitions and reporting the status of orders to customers.

Status

The Air Force estimates this system's acquisition to cost $219.1 million. The Air Force has expended $232.4 million, or 106 percent, of its estimated cost and 95.6 percent of its estimated schedule. According to the Air Force, the system has 100 percent of its operational capability but will not be fully deployed until later this summer.

Figure III.6: Cost, Schedule, and Performance Status of Stock Control and Distribution System



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