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United States Government Accountability Office

Report to the Chairman, Committee on Veterans' Affairs, House of Representatives

June 2008

VETERANS AFFAIRS

Health Information System Modernization Far from Complete; Improved Project Planning and Oversight Needed

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Accountability * Integrity * Reliability

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Why GAO Did This Study

The Department of Veterans Affairs (VA), through its Veterans Health Administration (VHA), provides health care for more than 5 million veterans each year. In 2001, VHA began an initiative, HealtheVet, to modernize its current medical information system. GAO's objectives were to determine the status of the modernization, VA's overall plan for completing it, and how VA is providing oversight to ensure the success of the initiative.

To conduct this review, GAO analyzed project documentation and interviewed officials responsible for the development and implementation of the new system.

What GAO Recommends

To better ensure the success of HealtheVet, GAO recommends that VA develop a project management plan that includes validated cost estimates and that it implement a complete governance structure, fill key leadership positions, and schedule and perform critical reviews. Commenting on a draft of this report, VA concurred with GAO's recommendations and described actions planned or being taken to address them.

What GAO Found

As of June 2008, the HealtheVet initiative has these eight major software development projects under way.

- One project is to further develop the Health Data Repository, a database of standardized health data. This database, which is currently operational, is not yet complete; additional types of health data remain to be standardized and added to the repository.
- Four application projects are currently in development.
- One application project is in the planning stage.
- Two projects are being pursued to enhance current systems, prepare them for transition to HealtheVet, and develop new applications.

From 2001 through fiscal year 2007, VA reported spending almost $600 million for these eight projects. The time frame for completing the projects and the HealtheVet system as a whole was 2012, but the projected completion date has now been delayed until 2018.

The department has a high-level strategy for HealtheVet, in which the remainder of the initiative is to be completed incrementally in phases (referred to as "blocks"), but it does not have a comprehensive project management plan to guide the remaining work. This work is considerable: the department plans to replace the 104 applications in its current medical information system with 67 modernized applications (of which 5 are currently in development, as described), 3 databases, and 10 common services (general software functions, such as messaging and security, on which application software can call as needed). In view of this scope, the importance is increased of developing a comprehensive project management plan that includes, among other things, an integrated schedule that considers all dependencies and defines subtasks to ensure that deadlines are realistic. Another important component of such planning is determining the resources necessary to accomplish tasks throughout the life cycle of the initiative. In April 2008, VA provided an $11 billion cost estimate for completion of HealtheVet; however, it has not yet independently validated this estimate. Having a validated cost estimate is essential to improve the accuracy of cost, schedule, and performance management. Without an integrated plan that includes independently validated cost estimates, VA increases the risk that HealtheVet could incur cost increases and continued schedule slippages and not achieve its intended outcomes.

Various levels and types of oversight are currently being provided for the HealtheVet initiative by business owners, developers, and departmental information technology governance boards. However, the business owners have not yet implemented a complete governance structure, several key leadership positions within the developers' organization are either vacant or filled with acting personnel, and the governance boards have not yet scheduled critical reviews of HealtheVet projects. Until all elements of governance and oversight are in place, the risk to the success of the HealtheVet initiative is increased.

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United States Government Accountability Office
Washington, DC 20548

June 30, 2008

The Honorable Bob Filner
Chairman
Committee on Veterans' Affairs
House of Representatives

Dear Mr. Chairman:

The Department of Veterans Affairs (VA) operates the largest health care delivery system in America, providing health care to more than 5 million patients in more than 1,000 facilities.[1] The department's health information system—the Veterans Health Information Systems and Technology Architecture (VistA)—is an essential part of health care delivery, helping to ensure the quality of health care received by the nation's veterans and their dependents. The use of VistA, which includes electronic health records, has been widely credited with improving health care among VA patients.[2]

However, VistA currently consists of numerous applications, some of which have been in operation for more than 20 years and, according to VA, have become increasingly difficult and costly to maintain. Further, these applications contain data that are not standardized across VA's medical facilities. Standardization is a prerequisite for data to be computable—that is, acted on by computer applications. Such data can provide important improvements to health care decision making—for example, allowing applications to provide alerts to clinicians (for drug allergies) or plot graphs of changes in vital signs such as blood pressure.

Accordingly, in 2001, the Veterans Health Administration (VHA) began an initiative to modernize VistA—the HealtheVet initiative. With HealtheVet, VA plans to standardize patient data and modernize health information

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[1] The number of patients is the projection for fiscal year 2008 reported in VA's 2009 budget request. According to the department, VA facilities include hospitals, nursing homes, domiciliary residential rehabilitation and treatment facilities, community-based outpatient clinics, independent outpatient clinics, and mobile outpatient clinics.

[2] For example, in 2006, VistA received the Innovations in American Government Award from Harvard University's Ash Institute for Democratic Governance and Innovation because it has led to reduced errors and provided cost savings in VA's delivery of health care.

software applications. In doing so, its goal is to move from the hospital-centric environment that has long characterized the department's health care operations to a veteran-centric environment built on an open, robust systems architecture that will more efficiently provide both the same functions and benefits of the existing system and enhanced functions based on computable data. The development and implementation of HealtheVet is also key to achieving electronic medical records that are interoperable between VA and the Department of Defense (DOD).[3]

Until the new system is fully implemented, the department continues to depend on the VistA system, which it intends to maintain concurrently—a complex task that requires VA to develop interfaces between HealtheVet and existing VistA software applications to ensure seamless delivery of care to veterans. According to the department, HealtheVet—the largest investment in the department's information technology portfolio—is scheduled to be fully implemented by 2018 at a total estimated cost of about $11 billion.[4]

Given the importance of the HealtheVet project to the department's efforts to deliver high-quality health care to veterans, you requested that we review the department's continuing efforts to develop and implement the modernized system. Specifically, our objectives were to determine (1) the status of the HealtheVet initiative, (2) VA's overall plan for completing the initiative, and (3) how the department is providing oversight to ensure the success of the initiative.

To achieve our objectives, we analyzed documentation including project schedules, development plans, technical approach descriptions, funding, transition plans, information technology governance plans, and information technology (IT) governance board charters and meeting minutes. To supplement our analysis, we interviewed officials responsible for department information technology and the HealtheVet initiative, including managers of individual HealtheVet projects. The information on costs that have been incurred for the HealtheVet projects were provided by VA officials. We did not audit the reported costs and thus cannot attest to their accuracy or completeness.

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[3]We define interoperability as the ability of two or more systems or components to exchange information and to use the information exchanged.

[4]This total includes the almost $600 million spent on HealtheVet through fiscal year 2007.

We conducted this performance audit from July 2007 through June 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. For more details on our objectives, scope, and methodology, see appendix I.

Results in Brief

As of June 2008, the HealtheVet program has these eight software development projects under way.

- The Health Data Repository (HDR) database became operational in 2006 with a limited set of health care data; it currently contains standardized health data in three areas that were given high priority by clinicians (vital signs, allergies, and outpatient pharmacy). The development project is currently focused on standardizing and converting laboratory data so that they can be added to the repository, with further types of health data (such as inpatient pharmacy data) to be added as the development of the HealtheVet system continues. Developing and populating the repository are major goals both for HealtheVet and for the collaboration between DOD and VA on developing interoperable health data that are to allow seamless transfer of information between the two departments.[5]

- Four health care applications are under development: Scheduling, Pharmacy, Laboratory, and Enrollment. The earliest to be deployed is the Scheduling application, which is planned for initial deployment at one location in September 2008.

- One software development project (Billing) is in the planning stage; this is a financial application for HealtheVet.

- Two projects (the VistA application development project and VistA foundations modernization project) are focused on activities to develop and implement required enhancements to existing VistA applications[6] and

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[5]GAO, *Information Technology: VA and DOD Are Making Progress in Sharing Medical Information, but Remain Far from Having Comprehensive Electronic Medical Records*, GAO-07-1108T (Washington, D.C.: July 18, 2007).

[6]For example, certain enhancements and fixes are necessary to ensure compliance with changes to patient enrollment and billing requirements.

lay the foundation for transitioning the applications to the modernized HealtheVet system. Among the aims of these projects is the development of common services—that is, administrative computer services, such as messaging and security, on which application software can call as needed.[7]

From 2001 through fiscal year 2007, VA reported spending almost $600 million for these eight projects. The time frame for completing the projects and the HealtheVet system as a whole is 2018; this is an extension since we first reported in 2003,[8] when the projected completion date was 2012. Department officials acknowledge that VA has experienced significant delays in developing and implementing HealtheVet and attribute the delays to various factors, including loss of experienced contractor staff, changes in technical and deployment approaches, and lack of management continuity. Department officials stated that they are working to address the delays by using an incremental development life-cycle approach; establishing more realistic time frames; and establishing an integrated product team composed of information technology, program, and acquisition personnel to address contracting issues.

Under VA's current strategy for HealtheVet, developed in August 2006, the department is taking an incremental approach to the remainder of the initiative, based on six phases (referred to as "blocks") that are to be completed in 2018. Under this strategy, the department plans to replace the 104 VistA applications that are currently in use with 67 applications, 3 databases, and 10 common services. Although considerable work remains to complete the final systems (work has not begun on 62 of the 67 planned applications), the department does not yet have a comprehensive project management plan to guide the development and integration of the many HealtheVet projects. That is, it does not have a plan that describes, among other factors, the project's scope, implementation strategy, and lines of responsibility, and includes an integrated schedule that considers all

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[7]Common services are important to the development of a service-oriented architecture— that is, an architecture in which application software locates, selects, and uses separately-provided software services that it needs to perform its intended function. The use of a service-oriented architecture is intended to provide the department more flexibility in making system changes and conform to the Federal Enterprise Architecture. The Federal Enterprise Architecture is intended to facilitate the coordination of common business processes, technology insertion, information flows, and system investments among federal agencies.

[8]GAO, *Computer-Based Patient Records: Short-Term Progress Made, but Much Work Remains to Achieve a Two-Way Data Exchange Between VA and DOD Health Systems*, GAO-04-271T (Washington, D.C.: Nov. 19, 2003).

dependencies and defines subtasks to ensure that deadlines are realistic. Further, among the key components of the plan is determining the resources necessary to accomplish tasks throughout the life cycle of the initiative. In April 2008, VA provided an $11 billion cost estimate for completion of HealtheVet; however, it has not yet had the estimate independently validated. Having a validated cost estimate is essential to improve the accuracy of cost, schedule, and performance management. Without an integrated plan that includes independently validated cost estimates, VA increases the risk that HealtheVet could incur schedule slippages and cost increases and not achieve its intended outcomes.

Various levels and types of oversight of the HealtheVet initiative are currently provided by the business owners (the Veterans Health Administration), the developers (within the organization of the department's Chief Information Officer), and departmental oversight boards established to manage IT investments. However, the business owners do not yet have a fully implemented governance structure for development projects that was endorsed by the department following a realignment of IT resources in which IT funding and personnel were placed under the control of the department's Chief Information Officer (CIO).) Without a complete HealtheVet governance structure in place, the business owners' ability to ensure that the HealtheVet projects meet business needs may be decreased. In addition, several key leadership positions within the developers' organization are either vacant or are filled with acting personnel. In the absence of permanent officials for these positions, the effectiveness of the department's oversight and management of technical development activities for the HealtheVet initiative may be reduced. Finally, although the IT governance boards have begun oversight to ensure, among other things, that investments align with the department's strategic plan, milestone reviews of HealtheVet projects have not yet been scheduled. It is important to hold milestone reviews on projects that are moving from one phase of development to the next, which at least one of the HealtheVet projects is scheduled to do in the near future. Without milestone reviews of project progress, the governance boards cannot effectively measure progress or determine the necessary funding needed for HealtheVet.

To better ensure the success of HealtheVet, we are recommending that the Secretary of Veterans Affairs direct the Chief Information Officer to develop a project management plan with validated cost estimates for HealtheVet, fill or permanently staff critical positions, and develop a schedule for performing milestone reviews of HealtheVet projects. In addition, to ensure proper oversight of HealtheVet, we are recommending

that the Secretary of Veterans Affairs direct the Veterans Health Administration Under Secretary to finalize and implement the HealtheVet governance structure.

In providing written comments on a draft of this report, the Deputy Secretary of Veterans Affairs concurred with the report's recommendations. (The department's comments are reproduced in app. II.) The comments describe actions that begin to address our recommendations. Among its actions, the department noted that the Office of Information and Technology is developing a comprehensive integrated HealtheVet project management plan to be completed by the end of this year and expects approval of a revised HealtheVet governance plan this July. If the actions planned or currently under way are properly implemented, they could help ensure that the system will be completed successfully.

Background

The current health information system used by VA clinicians is VistA. Since the inception of this system in 1983, VHA has made numerous enhancements to its functionality.[9] A significant example was the release in 1996 of the Computerized Patient Record System, which enabled the department to provide an individual electronic medical record for each VA patient. By fiscal year 2007, the implementation of an imaging capability (VistA Imaging) at all the department's facilities further enhanced the system by enabling multimedia data, such as radiology images, to be linked to a patient's electronic medical record. These collective enhancements to VistA resulted in a comprehensive, integrated, electronic medical record for each patient that is viewable by all of the department's clinicians at all of its health care facilities, thus eliminating the need for paper medical records.

According to VHA officials, VistA was developed based on close collaboration between staff in the medical facilities and VHA's IT personnel, with the intention of providing a system that met the clinicians' needs. In this regard, clinicians and IT personnel in the various medical facilities collaborated to define the system's requirements and, in certain cases, carry out its development and implementation. For example,

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[9]VistA began operation in 1983 as the Decentralized Hospital Computer Program. In 1996, the name of the system was changed to the Veterans Health Information Systems and Technology Architecture.

development of VistA Imaging resulted from a clinician building a prototype at home before it was fielded at a medical facility. Although system enhancements to VistA were disseminated through a central office, staff at a medical center could develop and implement applications at the local level to facilitate the potentially different functions at each location.

According to the department, as a result of VHA's decentralized development approach, VistA now consists of 104 separate computer applications. These include 56 health provider applications; 19 management and financial applications; 13 crosscutting applications such as patient data exchange; 8 registration, enrollment, and eligibility applications; 5 health data applications; and 3 information and education applications (app. III contains a complete list of these applications).

Besides being numerous, these applications have been customized at all 128 VA sites.[10] According to VA, this customization increases the cost of maintaining the system, as it requires that maintenance also be customized. VA has reported expending significant resources (approximately $2.5 billion) to maintain the system between 2001 and 2007.

Further, according to the department, limitations in the system need to be addressed for the system to remain effective. As mentioned, some VistA applications are more than 20 years old, and VistA does not standardize data, which is a prerequisite to making data computable. In addition, according to VA, VistA stores data in an organizational format based on the location where care is provided, rather than maintaining a global record for each individual patient, and it is programmed in a language for which there is a continually decreasing supply of qualified software developers.[11]

Accordingly, in 2001, VHA undertook the HealtheVet initiative in order to standardize its health care system and eliminate the approximately 128 different systems used by its field locations. As we reported in 2003, it planned to develop or enhance specific areas of system functionality through six projects, which were to be completed between 2006 and 2012

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[10]A site includes one or more facilities—medical centers, hospitals, or outpatient clinics—that store their electronic health data in a single database.

[11]This programming language, the Massachusetts General Hospital Utility Multi-Programming System, is now referred to as M or MUMPS.

(shown in table 1).[12] These six projects did not represent all the
functionality provided by the 104 VistA applications; rather, they were
high-priority projects that were under way at the time.

Table 1: Start and Completion Dates for HealtheVet Projects as of 2003

Project	Project start date	Estimated completion date
Health Data Repository	2001	2006
Billing[a]	2002	2006
Laboratory	2003	2007
Pharmacy	2002	2008
Imaging	2002	2011
Scheduling[b]	2001	2012

Source: GAO analysis of VA data.

[a]Renamed the Patient Financial Services System in 2003.

[b]Originally called the appointment scheduling replacement project.

In 2004, VA contracted with the Software Engineering Institute (SEI) for a
technical review of the HealtheVet program.[13] As a result of this review,
SEI concluded, among other things, that VA needed to improve and
integrate the governance of the HealtheVet program, develop an
organizational structure for the program, define the program's vision, and
define the path for transition from VistA to HealtheVet.

In 2005, VA began to take action on the SEI recommendations. For
example, the department began to develop a HealtheVet organizational
structure, including defining the responsibilities of a project management
office. In addition, it developed an initial draft for HealtheVet governance
that defined decision-making processes, established guidelines for issue
identification and escalation, defined areas of control and levels of
authority, and established accountability. However, the effort to develop a
governance plan and structure was superseded by a major realignment of
the department's overall IT management structure.

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[12]GAO, *Computer-Based Patient Records: Short-Term Progress Made, but Much Work
Remains to Achieve a Two-Way Data Exchange Between VA and DOD Health Systems*,
GAO-04-271T (Washington, D.C.: Nov. 19, 2003).

[13]SEI is a federally-funded research and development center operated by Carnegie Mellon
University. Its mission is to advance software engineering and related disciplines to ensure
the development and operation of systems with predictable and improved cost, schedule,
and quality.

This realignment, initiated in October 2005, was undertaken with the goal of providing greater authority and accountability over VA resources by centralizing IT management under the department's CIO; an additional goal was to standardize operations and systems development across the department using new management processes based on industry best practices.[14] Under the department's realigned structure, the Assistant Secretary for Information and Technology serves as VA's CIO.[15] The CIO is assisted by one Principal Deputy Assistant Secretary and five Deputy CIOs. In particular, the Deputy CIO[16] for Enterprise Development serves as the chief advisor to the CIO for all enterprise applications development activities, including HealtheVet; this official heads the Office for Enterprise Development, which is responsible for performing enterprise applications development.

Before the realignment, funding and approval of IT was controlled by each medical center director, this enabled local IT personnel to make changes to VistA applications that were specific to the local medical facility.[17] As a result of the realignment, the funding for all IT development projects, including both VistA and HealtheVet projects, was moved under the control of the department's CIO. The business owners (that is, VHA for VistA and HealtheVet) retain responsibility for development and prioritization of requirements and program oversight, while staff in the Office of Enterprise Development are responsible for planning and execution of information technology development projects.

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[14]We had previously reported that a contributing factor to VA's challenges in managing IT projects was the department's decentralized management structure, in which its administrations and headquarters offices controlled a majority of the department's IT budget. GAO, *Veterans Affairs: The Role of the Chief Information Officer in Effectively Managing Information Technology*, GAO-06-201T (Washington, D.C.: Oct. 20, 2005); and *Veterans Affairs: The Critical Role of the Chief Information Officer Position in Effective Information Technology Management*, GAO-05-1017T (Washington, D.C.: Sept. 14, 2005).

[15]In establishing the Office of Information and Technology, during fiscal year 2007, VA transferred over 6000 full-time information technology employees to the CIO. This is to enable the oversight of all projects and resources, which will be funded through the separate appropriation account for VA IT, established by Congress in fiscal year 2006.

[16]The department is awaiting congressional approval for three of these positions to be designated Senior Executive Service Deputy Assistant Secretary.

[17]GAO, *Information Technology: VA Has Taken Important Steps to Centralize Control of Its Resources, but Effectiveness Depends on Additional Planned Actions*, GAO-08-449T (Washington, D.C.: Feb. 13, 2008).

HealtheVet Projects Are Under Way, but Time Frames Have Slipped

As of June 2008, the HealtheVet program has eight major software development projects under way.[18] One of these is to continue development and population of an operational database that currently contains health data. Five are applications development projects, of which four are health care applications currently in development and one is a financial application in the planning stage. The remaining two projects are to enhance current VistA systems, prepare them for transition to HealtheVet, and develop new applications. However, since 2003, the time frames for completing the projects and the HealtheVet system as a whole have been extended from 2012 to 2018. Department officials acknowledge that VA has experienced significant delays in developing and implementing HealtheVet and attribute the delays to various factors, and stated that they are working to address the delays by using an incremental development life-cycle approach and establishing more realistic time frames, among other things.

Of the eight projects in progress, one is currently operational though not yet completed. The Health Data Repository (HDR) database, which became operational in 2006, currently contains standardized health data in three areas: vital signs, allergies, and outpatient pharmacy. These data were addressed first because they were given high priority by clinicians. As we have previously reported,[19] the department is currently using HDR to help achieve interoperability with DOD to support the exchange of computable electronic patient information. The HDR project is currently standardizing and converting laboratory data so that they can be added to the repository next, with further types of health data (for example, inpatient pharmacy, dental, and ophthalmology) to be added as the development of the HealtheVet system continues.

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[18]Major software development projects are those major IT investments for which the department has submitted a Capital Asset Plan and Business Case to the Office of Management and Budget to justify resource requests. This justification, called an Exhibit 300, contains information such as an investment's historical and future costs, performance measures and goals, cost-benefit analysis, acquisition strategy, risk assessment, and security issues.

[19]GAO, *Information Technology: VA and DOD Are Making Progress in Sharing Medical Information, but Remain Far from Having Comprehensive Electronic Medical Records*, GAO-07-1108T (Washington, D.C.: July 18, 2007).

Four projects are developing health care information applications:[20]

- The Scheduling application is planned for initial deployment at one site (a VA medical center in Muskogee, Oklahoma) in September 2008 (full deployment to all medical facilities is planned for 2011).

- For the Pharmacy project, final testing of one function (order checking) is scheduled to begin in September 2008, and new drug file and pharmacy data management systems are scheduled to be implemented in January 2009. Remaining system functions to be developed include inventory, order entry and clinical monitoring, medication dispensing, and medication administration. Further development of the Pharmacy application depends on the results of an ongoing analysis and evaluation of the costs of building and deploying these functions. This analysis, for which a contract was issued in February 2008, is due July 2008.

- The new Laboratory system is scheduled for independent verification and validation[21] in October 2008. National deployment is planned to begin in 2010, with a phased implementation across the department expected to take place over the next 5 years.

- The initial implementation of the Enrollment application is scheduled for August 2008. This project is to provide an enrollment workflow for use at VA's Health Eligibility Center. An enhancement is scheduled for implementation by July 2009 for communicating to veterans and providing operational efficiencies for VA staff at the Health Eligibility Center and medical centers to coordinate changes in veterans' eligibility. Finally, in December 2011, the department expects to complete a modernized registration capability.

A fifth project (Billing) is for a new financial system, which is in the planning stage. The current Billing project is a second attempt to modernize the billing system. Under the first attempt, VA awarded a contract in July 2003 to implement a commercial product to provide an updated billing capability for the department (called at that time the Patient Financial Services System); however, after about $107 million was spent on this effort, the contract was terminated in September 2006 by

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[20]One project (Imaging) that was part of the original development strategy is now to be implemented at a later, undetermined date.

[21]The purpose of independent verification and validation is to provide an independent review of system processes and products to ensure that quality standards are being met.

mutual agreement between the department and the contractor. The department expects to complete national deployment of the current project (called the Revenue Improvements and System Enhancement project) at the end of fiscal year 2015.

Finally, the program has two ongoing projects that are focused on activities to develop and implement required enhancements to existing VistA applications and lay the foundation for transitioning these applications to HealtheVet:

- The focus of the VistA application development project in the near term is to develop the critical enhancements and fixes to the VistA system that are necessary to ensure compliance with changes to patient enrollment and billing requirements and accomplish other critical data updates. In fiscal year 2010, the emphasis for this initiative will shift from fixes and enhancements to new development work aimed at the transition to HealtheVet. The initiative will then encompass building many of the replacement systems within HealtheVet.

- The VistA foundations modernization project includes work on architecture and testing services, including a comprehensive testing suite and strategy for all VistA and HealtheVet applications. In fiscal year 2009, several common services—the deployment toolkit, business rules engine, and workflow engine—are expected to be delivered, along with new testing services capabilities and updates to the overall architecture. This work is expected to be ongoing until the completion of the HealtheVet initiative.

Table 2 summarizes the status of these projects.

Table 2: Status of HealtheVet Projects

Project	Current status	Next steps	Date	Planned completion date
Health Data Repository	Operational	National rollout	Fiscal year 2009	2018
Enrollment	In development	Initial implementation of workflow	August 2008	2011
		Enhancement for communicating to veterans and coordinating eligibility information	July 2009	
		Modernized registration capability	December 2011	
Scheduling	In development	Planned initial deployment at one site	September 2008	2011
Pharmacy	In development	Beginning of final testing of new and enhanced order checking	September 2008	2011
		Replacement of national drug file and pharmacy data management systems	January 2009	
Billing	In planning	—	—	2015
Laboratory	In development	Independent verification and validation	October 2008	2015
		Initial field testing	April 2009	
		Beginning of national deployment	2010	
VistA Application Development	In development	Enhancements and fixes of VistA	Ongoing	2018
		New development for HealtheVet	2010	
VistA Foundations Modernization	In development	Delivery of a comprehensive testing suite for all HealtheVet applications development	Fiscal year 2008	2018
		Additional common services and tools	Fiscal year 2009	

Source: GAO analysis of VA data.

Note: The plan as of 2003 (see table 1) also included the Imaging project; work on the HealtheVet version of this system has not yet begun.

From the inception of the initiative in 2001 through fiscal year 2007, VA reported spending almost $600 million for the development of these eight projects. The department estimates that it will incur additional development costs of approximately $535 million for the initiative during fiscal years 2008 and 2009, with the estimated total development cost of HealtheVet being $11 billion when completed in 2018. Table 3 shows the reported development costs through fiscal year 2007 and estimated development costs for fiscal years 2008 and 2009.

Table 3: HealtheVet Project Development Costs

Dollars in millions

Project	Reported development cost through FY 2007	Estimated development cost for FY 2008 and 2009
Health Data Repository	$136	$50
Scheduling	85	50
Pharmacy	56	27
Billing	107	1
Laboratory	16	36
Enrollment	47	29
VistA application development	58	181
VistA foundations modernization	93	161
Total	**$598**	**$535**

Source: GAO analysis of data provided by VA.

In addition, the time frames for completing the projects and the HealtheVet system as a whole have been extended since the inception of the HealtheVet initiative. As shown in table 1, the time frames as of 2003 envisioned completion by 2012. Current time frames extend the completion date to 2018.

Officials from VA's Office of Information and Technology acknowledged that VA had experienced significant delays in developing and implementing HealtheVet. These officials attribute the delays to various factors, including changes in technical and deployment approaches, lack of management continuity, and loss of experienced contractor staff.

For example, changes in technical and deployment approaches delayed the development of the Scheduling, Health Data Repository, Pharmacy, Laboratory, and Enrollment projects. In particular, for Scheduling, Health Data Repository, Laboratory, and Enrollment, VHA has alternated between developing the systems in-house and using a commercial off-the-shelf product. In addition, programming languages for the Scheduling and Enrollment projects changed. Finally, VHA changed the deployment approach for Pharmacy annually between 2003 and 2007.

Several projects experienced management turnover. For example, the Enrollment project has had multiple program managers since it began, and

the VistA application development and VistA foundations modernization projects have seen more than one change in program management.

Finally, the Scheduling, Health Data Repository, Laboratory, Vista Application Development, and Vista Foundations Modernization projects were delayed by the loss of experienced contractor staff. These initiatives were supported by an overall contract for HealtheVet. When this contract expired in September 2006, it was renewed on a monthly basis to ensure continuity of work until a new contract was awarded. However, task orders from the new contract, which was signed in November 2006, were not issued until June, July, and September 2007. According to department officials, as a result of these delays, the experienced contractor staff who supported the initiatives had moved to other work, corporate knowledge for these initiatives was lost, and new contractor staff had to be hired and educated.

Department officials stated that they are working to address the delays experienced by using an incremental, development life-cycle approach and establishing more realistic time frames for the effort. In addition, to address future contracting issues, the department is establishing an integrated product team composed of IT, program, and acquisition personnel.
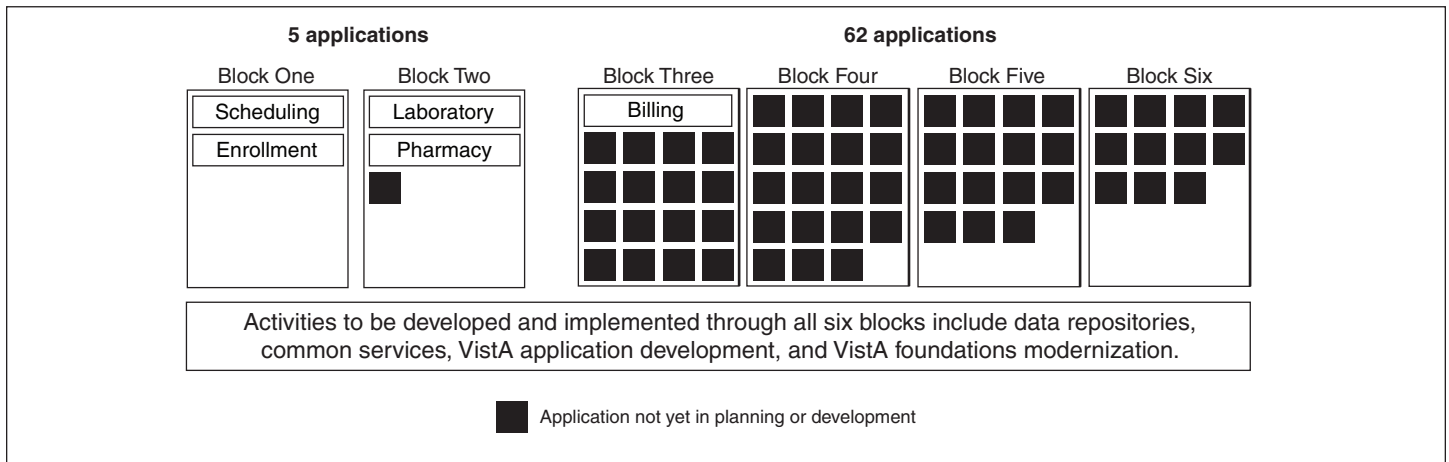
VA Has Developed an Overall Strategy for HealtheVet, but It Lacks a Project Management Plan

Under VA's current strategy for HealtheVet, developed in August 2006, the department is taking an incremental approach to the remainder of the initiative, based on six phases (referred to as "blocks") that are to be completed in 2018. Under this strategy, the department plans to replace the 104 VistA applications that are currently in use (see app. III) with 67 applications, 3 databases,[22] and 10 common services.[23] Figure 1 provides a high-level overview of the strategy, and table 4 lists all the planned software development applications by block.

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[22]One of these—the Health Data Repository—has already been discussed. The two other planned databases are an administrative data repository and a clinical data warehouse.

[23]Common services are administrative computer services, such as messaging and security, on which application software can call as needed. Such services are used in service-oriented architectures, in which application software locates, selects, and uses separately provided software services that it needs to perform its intended function. The 10 common services are security, personal service/ID management, organizational service/ID management, messaging/enterprise service bus, deployment toolkit, audit, archive, business rules engine, workflow engine, and standardization and terminology.

Figure 1: Overview of High-Level Strategy for HealtheVet

Source: VA.

Table 4: HealtheVet Software Applications and Blocks

Block 1	Block 2	Block 3
• **Scheduling**	• **Laboratory**	• Implant management
• **Enrollment**	• **Pharmacy**	• Health care acquired infection and influenza surveillance
	• Bar code expansion project	• Emergency room
		• Clinical decision support
		• Home telehealth
		• Oncology
		• Mental health
		• Fee basis
		• Compensation and pension records interchange
		• MyHealtheVet (online access application)
		• Joint inpatient electronic health record
		• Enhanced VA/DOD seamless care
		• **Billing** (renamed revenue improvements system enhancement)
		• Prosthetics
		• Report writer
		• Patient information management system
		• Workload management

Block 4	Block 5	Block 6
• Discharge summary	• Clinical procedures	• Health summary
• Consult/request tracking	• Clinical device connectivity	• Library
• Clinical reminders	• Clinical case registries	• Incident reporting
• Automated information collection system	• Care management	• Blind rehabilitation
• Authorization/subscription utility	• Ophthalmology	• Beneficiary travel automated safety incident surveillance tracking system
• Adverse reaction tracking	• Nutrition and food service	• Voluntary service system
• Women's health	• Nursing service	• Veterans' personal finance system
• Vitals/measurements	• Imaging system[a]	• Spinal cord dysfunction
• Text integration utilities	• Home-based primary care	• Police and security
• Remote order entry system	• Employee health record	• Patient advocate tracking system
• Progress notes	• Dental record manager	
• Problem list	• Social work	
• Outpatient clinical care	• Release of information	
• Order entry/results reporting	• Radiology/nuclear medicine	
• Order check expert	• Quality audiology and speech analysis and reporting	
• Intake/output		

Source: GAO analysis of VA information.

Note: The projects under way are in bold.

[a]Although included in the initial plan (see table 1), work on the imaging system has not begun.

As table 4 shows, work has not yet been initiated on many applications that are planned for the final system. Further, although the department has established interim dates for completing projects that are under way, as of mid-June 2008, the department had not developed a detailed schedule or approach for completing the HealtheVet initiative, including the remaining 62 software applications, other than to state that it intends to complete all six blocks of the initiative by 2018.

Industry best practices and IT project management principles[24] stress the importance of accountability and sound planning for any project, particularly an effort of the magnitude and complexity of HealtheVet. Inherent in such planning is the development and use of a project management plan that describes, among other factors, the project's scope, implementation strategy, lines of responsibility, security requirements, resources, and estimated schedule for development and implementation. Specifically, an effective project management plan incorporates all the

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[24]Institute of Electrical and Electronics Engineers, *IEEE/EIA Guide for Information Technology*, IEEE/EIA 12207.1-1997 (April 1998).

critical areas of system development and is to be used as a means of determining what needs to be done and when, and should measure progress. Such a plan also includes an integrated schedule that considers all dependencies and includes subtasks so that deadlines are realistic, and it incorporates reviews to allow oversight and approval by high-level managers.

A key component of planning is determining the resources necessary to accomplish the myriad tasks needed throughout the life cycle of the initiative. In April 2008, VA provided an $11 billion cost estimate to complete HealtheVet; however, it has not yet independently validated these estimates. We stress in our Cost Assessment Guide[25] that having a validated cost estimate is essential to improve the accuracy of cost, schedule, and performance management. Validated cost estimates are also important to facilitate program approval and determine the necessary funding needed for HealtheVet.

Without an integrated plan that includes independently validated cost estimates, VA increases the risk that HealtheVet could incur schedule slippages and cost increases and not achieve what it intends to achieve.

VA Has Not Fully Established an Oversight Structure for HealtheVet

In the wake of the realignment of IT resources under central, department-level control, VA leadership endorsed an approach to the oversight and governance of IT development projects that is based on ensuring the involvement of senior management from both the user and the developer organizations.[26] Under this approach, business owners establish IT requirements, business benefits, and priorities and oversee full life-cycle execution of IT programs. The department's CIO organization provides the developers who devise technology solutions for the users. In addition, CIO officials chair a set of IT governance boards that review progress and recommend funding for IT projects; these boards include executive-level representation from business owners.

For the HealtheVet initiative, various levels and types of oversight are currently provided by the business owner (the Veterans Health

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[25]GAO, *Cost Estimate Guide: Best Practices for Estimating and Managing Program Costs, Exposure Draft*, GAO-07-1134SP (Washington, D.C.: July 2007).

[26]This governance structure has been put in place on another VA initiative—the Financial and Logistics Integrated Technology Enterprise.

Administration), the developers (the Office of Enterprise Development within the department's CIO organization), and departmental IT governance boards. However, the business unit has not yet finalized a governance plan or implemented a complete governance structure, several key leadership positions within the developers' organization are either vacant or filled with acting personnel, and the IT governance boards have not yet scheduled critical reviews of HealtheVet projects. Until all elements of governance and oversight are in place, the risk is increased that the HealtheVet initiative may experience cost overruns and continued schedule slippages and may not achieve what it intends to achieve.

VHA Has Not Fully Implemented a HealtheVet Governance Structure

VHA has not yet established a governance structure for HealtheVet in accordance with the approach endorsed by the department. Under this approach, business unit governance for IT initiatives is provided at several levels. An Executive Steering Committee, chaired by the head of the business unit, provides executive oversight. Reporting to the Executive Steering Committee is an Oversight Board that is responsible for ensuring that all stakeholders are represented in defining requirements, monitoring progress, and determining that the initiative is meeting their needs. Finally, a Program Director is responsible for day-to-day oversight activities to ensure that the technical solution provided by the developers meets business needs (such as requirements development and testing) and for coordinating with the developers' program office.

According to senior management officials, VHA has not yet established a governance structure for HealtheVet in accordance with this approach, but it has developed a plan to do so. According to these officials, they worked with the departmental CIO organization to develop this plan. Officials told us that the plan had been approved by the Under Secretary for Health and was under review and awaiting approval by the Secretary of Veterans Affairs (we anticipate reviewing the plan upon its approval by the Secretary). VHA officials expect the plan to be approved next month. However, the officials did not provide a schedule for finalizing the plan and implementing the structure.

Until the governance structure is implemented, VHA is providing oversight of the HealtheVet initiative through various means. For example, according to officials, the former VHA CIO (now the Chief Officer of VHA's Office of Information) briefs the VHA head (the Under Secretary for Health) twice weekly. In addition, the Office of Information holds formal meetings every two weeks with the developers (the Office of Enterprise Development in the department's CIO organization) on three or four IT

projects (which may include HealtheVet projects). Further, VHA's Office of Information holds meetings with VHA managers who act as business liaisons between VHA and the departmental CIO organization. VHA also has an Information Data Management Committee that establishes priorities for VHA IT investments (including HealtheVet) and makes funding recommendations to the Under Secretary. This committee includes major VHA stakeholders, including headquarters and regional executives, as well as the Chief Officer, who co-chairs the council.
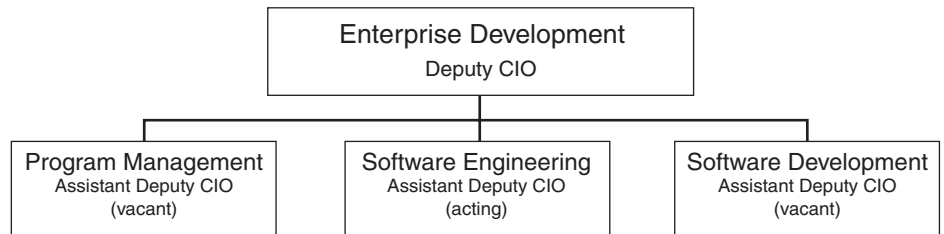
These means fulfill some of the functions of the governance model endorsed by the department. That is, the Information Data Management Committee performs some of the oversight functions of an Oversight Board, and the Chief Officer coordinates with the developers' program office. However, there is currently no equivalent to an Executive Steering Committee, and there is no Program Director. If the draft governance plan follows the model endorsed by the department, its approval and implementation would include these elements.

Without a complete governance structure in place, the business owners' ability to perform appropriate oversight of the HealtheVet projects may be decreased.

Key Positions within the Office of Enterprise Development Are Vacant

The Office of Enterprise Development within the departmental CIO organization is responsible for development of the HealtheVet projects. This office provides day-to-day oversight and management of the technical development activities. However, currently several key leadership positions within the Office of Enterprise Development are either vacant or are filled with acting personnel. That is, positions within Program Management and Software Development are vacant, and the Assistant Deputy CIO for Software Engineering is acting (see fig. 2 for an organizational chart showing these positions).

Figure 2: Organizational Chart of the Office of Enterprise Development

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                    ┌──────────────────────────┐
                    │  Enterprise Development   │
                    │        Deputy CIO         │
                    └──────────────────────────┘
            ┌────────────────┼────────────────┐
┌───────────────────┐ ┌───────────────────┐ ┌───────────────────┐
│ Program Management│ │Software Engineering│ │Software Development│
│ Assistant Deputy  │ │ Assistant Deputy  │ │ Assistant Deputy  │
│       CIO         │ │       CIO         │ │       CIO         │
│     (vacant)      │ │     (acting)      │ │     (vacant)      │
└───────────────────┘ └───────────────────┘ └───────────────────┘
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Source: GAO analysis of VA data.

The position of Assistant Deputy CIO for Program Management is currently vacant; this position is responsible for activities such as managing a program's portfolio of IT applications during its entire life cycle, as well as for developing and managing project plans and schedules and managing risk. In addition, the position of head of Software Engineering is filled by an acting Assistant Deputy CIO; this position has responsibility for overseeing the architecture of an application's technical solution. Another Assistant Deputy CIO position (head of Software Development) is vacant; this position is responsible for ensuring that software deliverables meet their expected requirements. In commenting on a draft of this report, the department noted that a vacancy announcement for the Assistant Deputy CIO for Program Management position has been posted with a closing date of July 7, 2008. Until these key leadership positions are permanently staffed, the risk is increased that the department's management and control of the HealtheVet initiative will not be efficient and effective.

IT Governance Boards Have Been Established, but No Milestone Reviews Have Been Scheduled

In 2007, three VA governance boards for IT investment projects were established; they have the following general responsibilities:

- The Business Needs and Investment Board (chaired by the Principal Deputy Assistant Secretary) is to evaluate whether proposed IT investment projects meet business needs.

- The Planning, Architecture, Technology, and Services Board (chaired by a Deputy CIO)[27] determines whether IT projects meet technical standards by, among other things, performing milestone reviews.

- The Information Technology Leadership Board (chaired by the CIO) uses input from the two other boards to make recommendations to the department's Strategic Management Council for funding the major categories of IT projects.

Although the boards are chaired by officials in the CIO's office, they all include high-level executives from the user organizations. For example, the VHA representative on the Information Technology Leadership Board is the head of VHA—the Under Secretary for Health.

Since being established, the three governance boards have begun providing oversight to ensure that investments align with the department's strategic plan and that business and budget requirements for ongoing and new initiatives meet user demands. In 2007, the three boards evaluated the HealtheVet projects that were proposed for fiscal year 2009, and the Information Technology Leadership Board made funding recommendations to the department's Strategic Management Council. As a result of these deliberations, the department requested about $330 million for HealtheVet development projects for fiscal year 2009.

However, there is one oversight function that has not yet been exercised for the HealtheVet projects: milestone reviews. Milestone reviews, which are a responsibility of the Planning, Architecture, Technology, and Services Board, afford an opportunity for progressive decision making about the program under review and are coupled with authorization for funding. The VA milestone review process includes concept definition, requirements development, system design and prototype, system development and testing, system deployment, and operations and maintenance. Each step in the process has specific and organizationally required exit criteria that must be satisfied before the program can proceed to the next stage.

The Planning, Architecture, Technology, and Services Board has performed one milestone review since being established (this was a

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[27]The Deputy CIO for IT Enterprise Strategy, Policy, Plans, and Programs.

system design and prototype review for another IT development project).[28] However, the board has not yet developed a schedule for any milestone reviews for HealtheVet projects. In particular, although the Enrollment project is scheduled for initial implementation in August 2008, no system deployment milestone review has been scheduled. According to the chair of this board, although no HealtheVet milestone reviews have been scheduled, the board has scheduled an operational test readiness review for another HealtheVet project (the Scheduling project) in June 2008 to verify that the application functions as designed are ready for initial deployment. Doing such a review should provide the board with useful information for oversight of this project. Nonetheless, it is important to hold milestone reviews on all projects that are moving from one phase of development to the next. Without milestone reviews of project progress, the governance boards cannot effectively measure progress or determine the funding needed for HealtheVet.

Conclusions

Although VA has made progress on its $11 billion HealtheVet initiative, it has also experienced significant delays, and none of the associated development projects have been completed. Moreover, VA is proceeding with this complex initiative without a project management plan and validated cost estimates to coordinate and guide the effort.

At the same time, a governance structure for HealtheVet has not yet been established, and key leadership positions that are responsible for providing day-to-day oversight have not been permanently staffed. Further, several IT governance boards with oversight responsibility for HealtheVet have not yet performed essential reviews of HealtheVet projects to gauge progress and funding requirements and the department lacks a time frame for doing so. Until the department takes the necessary actions to fully address these matters, it will face the risk that HealtheVet may experience cost overruns and continued schedule slippages, and may not achieve the outcome it intends to achieve.

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[28]This project—the Financial and Logistics Integrated Technology Enterprise project—will replace VA's existing core financial management and logistics systems and many of the legacy stovepipe systems interfacing them with an integrated, commercial off-the-shelf package.

Recommendations for Executive Action

To better ensure the success of HealtheVet, we recommend that the Secretary of Veterans Affairs direct the Chief Information Officer to take the following four actions:

- Develop a project management plan that encompasses all six blocks of HealtheVet.

- Validate cost estimates for all six blocks of HealtheVet.

- Expedite efforts to permanently staff the position of the Director of the Program Management office and fill other critical leadership positions in the Office of Enterprise Development.

- Develop a schedule for and conduct milestone reviews of the HealtheVet projects.

In addition, to ensure proper oversight of HealtheVet, we recommend that the Secretary of Veterans Affairs direct the Veterans Health Administration Under Secretary to take the following action:

- Finalize and implement the plan to establish the HealtheVet governance structure.

Agency Comments and Our Evaluation

In providing written comments on a draft of this report, the Deputy Secretary of Veterans Affairs agreed with our conclusions and concurred with our recommendations. (The department's comments are reproduced in app. II.) The comments described actions planned or being taken that respond to our recommendations. For example, according to the department, the Office of Information and Technology is developing a comprehensive, integrated HealtheVet project management plan to be completed within 6 months that is to reflect dependencies between resources and establish a single schedule for all VA medical information technology projects. As part of this plan, the department noted that it will include the format and schedule for conducting milestone reviews for HealtheVet projects. In addition, the department stated that it has hired a contractor to conduct an independent financial validation of the HealtheVet preliminary cost estimate that includes three phases and is to be completed by February 2009. To address staffing within the Office of Enterprise Development, the department stated that it had posted a vacancy announcement to fill the leadership position for the Program Management Office. Lastly, the department said it expects final review and approval of the HealtheVet governance plan by July 2008. If the actions

that the department has planned or undertaken are properly implemented, they should help ensure success with the development and implementation of HealtheVet. The department also provided technical comments on the draft report, which we have incorporated as appropriate.

As agreed, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we are sending copies of this report to interested congressional committees and the Secretary of Veterans Affairs. Copies of this report will also be made available to other interested parties on request. This report will also be available at no charge on our Web site at http://www.gao.gov.

Should you or your staffs have any questions on matters discussed in this report, please contact me at (202) 512-6304 or melvinv@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IV.

Sincerely,

Valerie C. Melvin

Valerie C. Melvin
Director, Human Capital and Management
Information Systems Issues

Appendix I: Objectives, Scope, and Methodology

As requested, the objectives of our review were to determine (1) the status of the HealtheVet initiative, (2) VA's overall plan for completing the initiative, and (3) how VA is providing oversight to ensure the success of the initiative. We conducted our review by reviewing relevant HealtheVet project and budget documentation and validated our analyses through interviews with knowledgeable VA officials.

To determine the status of the HealtheVet initiative, we reviewed individual HealtheVet documents on system operation and development, time frames, and activities planned. Additionally, we researched the department's expenditures on HealtheVet initiatives through fiscal year 2007 and the department's current estimate of how much it plans to spend in fiscal years 2008 and 2009. We did not assess the accuracy of the cost data provided to us. We supplemented our analyses with interviews of VA personnel involved in the initiative. We also observed demonstrations of scheduling and enrollment prototypes to better understand how HealtheVet initiatives could provide enhanced service to patients and better support VA's medical care providers. Finally, to gain user perspective on moving from VistA to HealtheVet, we visited the VA Medical Center in Salem, Virginia, because it had recently installed customized enhancements to VistA.

To determine VA's plan for completing HealtheVet, we reviewed the department's strategy and transition plan. We supplemented this review with responsible officials at the Office of Information and Technology, including the Deputy CIO for Enterprise Development and the Acting Deputy Director of the Program Management Office within the Office of Enterprise Development, to identify the department's current strategy for the completion of HealtheVet. We summarized information obtained through interviews and reviews of HealtheVet documents to illustrate VA's approach to completing the initiative.

To determine how VA is providing oversight for HealtheVet, we reviewed department information technology (IT) governance documents, including the IT Governance Plan, as well as the charters of the three VA IT governance boards, to determine the boards' roles and responsibilities for oversight of VA IT initiatives such as HealtheVet. In addition, we reviewed minutes of the three VA IT governance boards to determine the extent of their oversight of HealtheVet to date. We interviewed the chairman of the Planning, Architecture, Technology, and Services Board to determine that board's plans for conducting future milestone reviews for HealtheVet. We also reviewed the Office of Enterprise Development organizational structure and responsibilities. We interviewed the Chief Officer of VHA's

Office of Information and members of his staff to obtain information on
the plan under development to provide governance for HealtheVet.

We conducted this performance audit at the Department of Veterans
Affairs headquarters in Washington, D.C., and the VA medical center in
Salem, Virginia, from July 2007 through June 2008, in accordance with
generally accepted government auditing standards. Those standards
require that we plan and perform the audit to obtain sufficient, appropriate
evidence to provide a reasonable basis for our findings and conclusions
based on our audit objectives. We believe that the evidence obtained
provides a reasonable basis for our findings and conclusions based on our
audit objectives.

THE DEPUTY SECRETARY OF VETERANS AFFAIRS
WASHINGTON

June 24, 2008

Ms. Valerie C. Melvin
Director
Human Capital and Management Information Systems
U.S. Government Accounting Office
441 G. Street NW
Washington, DC 204548

Dear Ms. Melvin:

The Department of Veterans Affairs (VA) has reviewed the Government Accountability Office's (GAO) draft report, **Veterans Affairs: Health Information System Modernization Far from Complete; Improved Project Planning and Oversight Needed** (GAO-08-805). The report validates all the efforts that are in the process of being finalized or are presently underway. As examples, the over arching governance structure is in final coordination and will be finalized by the end of this month, the life-cycle cost estimate recently developed is presently undergoing an independent validation, a draft comprehensive project plan detailing all the steps necessary to develop and implement the replacement system was completed and is undergoing extensive validation and review.

In the past year, with the consolidation of all information technology activities into a single organization, we have been able to transform how the department approaches the management of large information technology development programs. These efforts are not one time activities and require constant attention and focus which we are committed to providing. The enclosure describes the efforts that are presently underway that align with each of GAO's recommendations in detail.

VA appreciates the opportunity to comment on your draft report.

Sincerely yours,

Gordon H. Mansfield

Enclosure

Enclosure

Department of Veterans Affairs (VA)
Comments to
Government Accountability Office (GAO) draft report,
*VETERANS AFFAIRS: Health Information System Modernization Far from
Complete; Improved Project Planning and Oversight Needed*
(GAO-08-805)

**To better ensure the success of HealtheVet, GAO recommends that
the Secretary of Veterans Affairs direct the Chief Information Officer
to take the following five (sic) actions:**

◊ **Develop a project management plan that encompasses all six
blocks of HealtheVet.**

Concur - The Office of Information and Technology (OI&T) is developing a
comprehensive integrated HealtheVet project management plan. Features of the
integrated plan include:

- Establishing a single schedule for all VA medical information technology (IT)
- Enabling key decisions for sustaining the VistA- HealtheVet environment VA
  is operating and planning, to include Replacement Scheduling Application
  (RSA) and 80 other HealtheVet modules, as well as more than 60 VistA
  applications
- Depicting dependencies between resources to eliminate "stack-ups" or
  disconnects in programs/projects, activities, and locations
- Providing a visual tool for understanding scheduled activities, and measuring
  objective progress against the schedule
- Providing ability to forecast the impact and consequences of changes or
  problems with the schedule (both positively and negatively)

VA estimates completing this plan within 6 months and will include it in the
bimonthly briefings to Congress.

◊ **Validate cost estimates for all six blocks of HealtheVet.**

Concur - OI&T has developed a preliminary cost estimate (included in the report).
In May 2008, the Space and Naval Warfare Systems Center Charleston
(SPAWAR) was tasked with conducting an independent financial validation of the
10 year life cycle costs for the HealtheVet suite of applications. This review will
have three phases, which include:

- Phase 1 - Quick-look Sufficiency Review: Review relevant artifacts; interview
  appropriate parties and formulate an opinion on the sufficiency of the VA
  budget preparation process for the HealtheVet 10 year life-cycle cost estimate

Enclosure

Department of Veterans Affairs (VA)
Comments to
Government Accountability Office (GAO) draft report,
*VETERANS AFFAIRS: Health Information System Modernization Far from
Complete; Improved Project Planning and Oversight Needed*
(GAO-08-805)
(Continued)

submitted to Congress and the Office of Management and Budget. Estimated
completion date: July 2008.

- Phase 2 – Risk Analysis: Define and perform an uncertainty analysis (risk) of
current cost estimate of the HealtheVet 10 year life-cycle cost estimate.
SPAWAR will develop an initial cost risk model to characterize the probability
distributions of the key cost elements associated with the VA-developed
HealtheVet cost estimate and review and iterate the cost model to develop
statistical estimates of the overall cost estimate uncertainty. Estimated
completion date: September 2008.

- Phase 3 - Independent Cost Estimate: Develop an independent cost estimate
of the HealtheVet 10 year life-cycle. Using the information/data collected
during the first two phases and the initial period of this phase, SPAWAR shall
apply government best practices to develop an independent life cycle cost
model. Estimated completion date: February 2009.

    ◊ **Expedite efforts to permanently staff the position of the
Director of the Program Management office and fill other
critical leadership positions in the Office of Enterprise
Development.**

Concur - The Director of the Program Management position is a Senior Executive
Service position (Assistant Deputy CIO, Enterprise Development Program
Management). The Secretary approved this position on October 23, 2007. The
vacancy announcement has been posted with a closing date of July 7, 2008.
OI&T maintains a staffing plan that depicts critical fills, and is actively recruiting to
fill these positions. In addition, an interagency agreement has been put in place
with SPAWAR, which provides for the assignment of SPAWAR government staff
to OI&T positions.

    ◊ **Develop a schedule for and conduct milestone reviews of the
HealtheVet projects.**

Concur - OI&T is working with the IT strategic planning division in order to
determine appropriate formats and schedules for milestone reviews. Milestone
reviews involve a number of stakeholders to ensure comprehensive program

2

Enclosure

Department of Veterans Affairs (VA)
Comments to
Government Accountability Office (GAO) draft report,
*VETERANS AFFAIRS: Health Information System Modernization Far from
Complete; Improved Project Planning and Oversight Needed*
(GAO-08-805)
(Continued)

review. The review format and schedule will be included in the project
management plan and will, therefore, be published within 6 months.

> **In addition, to ensure proper oversight of HealtheVet, GAO
> recommends that the Secretary of Veterans Affairs direct the
> Veterans Health Administration Under Secretary to take the
> following action:**
> ◊ **Finalize and implement the plan to establish the HealtheVet
>   governance structure.**

Concur - As stated in GAO's draft report, in 2004, VA contracted with the
Software Engineering Institute (SEI) for the technical review of the HealtheVet
program effort. As a result of this review, SEI concluded, among other things,
that VA needed to improve and integrate the governance of the HealtheVet
program. In 2005, VA began to take action on the SEI recommendations by
beginning to develop an initial draft for HealtheVet governance that defined
decision-making processes, established guidelines for issue identification and
escalation, defined areas of control and levels of authority, and established
accountability. However, the effort to develop a governance plan and structure
was superseded by a major realignment of the Department's overall IT
management structure.

Following the realignment, a major effort was undertaken by the Veterans Health
Administration's (VHA) Office of Information to develop a governance structure
for HealtheVet in accordance with the approach endorsed by the Department and
in alignment with previously approved governance structures for Financial and
Logistics Integrated Technology Enterprise (FLITE) and Veterans Services
Network (VETSNET). Under this approach, HealtheVet governance for IT
initiatives is provided at several levels. An Executive Steering Committee,
chaired by VHA's Under Secretary for Health provides executive oversight.
Reporting to the Executive Steering Committee is an Oversight Board, which is
chaired by the Deputy Under Secretary for Health with responsibility for ensuring
that all stakeholders are represented in defining requirements, monitoring
progress, and determining that the HealtheVet program is meeting their needs.
Finally, a program director has been established with responsibility for day-to-day
oversight activities to ensure that the technical solution provided by the

3

Enclosure

Department of Veterans Affairs (VA)
Comments to
Government Accountability Office (GAO) draft report,
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(GAO-08-805)
(Continued)

developers meets business needs and that the integrated HealtheVet program is
performing on-scope, on-cost, and on-schedule.

On March 27, 2008, VHA's Under Secretary for Health formally approved the
proposed HealtheVet governance structure. Subsequently, VHA revised the
governance document based upon comments from departmental offices. Final
review and approval of the document by VA's Secretary is targeted by
July 2008.

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Appendix III: Existing VistA Applications Overview

According to VA, all of the functionality delivered by the VistA applications described below will be either rehosted or replaced as part of HealtheVet.

Application name	Description
Health Provider Applications	
Care Management	Offers a convenient way for healthcare providers to view information about multiple patients on a single screen. Users can see at a glance multiple patients for whom they have items that require attention.
Clinical Procedures	Passes final patient results between vendor clinical information systems and VistA.
Computerized Patient Record System	Enables clinicians to enter, review, and continuously update all order-related information connected with any patient.
CPRS: Adverse Reaction Tracking	Provides a common and consistent data structure for adverse reaction data.
CPRS: Authorization/Subscription Utility	Provides a method for identifying who is authorized to perform various actions on clinical documents.
CPRS: Clinical Reminders	Assists clinical decision-making and educate providers about appropriate care. The primary goal is to provide relevant information to providers at the point of care, for improving care for veterans.
CPRS: Consult/Request Tracking	Provides an efficient way for clinicians to order consultations and procedures from other providers or services within the hospital site, at their own facility or another facility.
CPRS: Health Summary	A clinically oriented, structured report that extracts many kinds of data from VistA and displays it in a standard format.
CPRS: Problem List	Provides the clinician with a current and historical view of the patient's health care problems across clinical specialties and allows each identified problem to be traceable through the VistA system in terms of treatment, test results, and outcome.
CPRS: Text Integration Utilities	Simplifies the use and management of clinical documents for both clinical and administrative medical facility personnel.
Dentistry	A menu-based system incorporating features necessary for the maintenance of medical center dental records.
Hepatitis C Case Registry	Contains important demographic and clinical data on VHA patients identified with Hepatitis C infection.
Home Based Primary Care	Designed to allow for the local entry and verification of patient-related data at an individual medical center.
Immunology Case Registry	Contains important demographic and clinical data on VHA patients identified with Human Immunodeficiency Virus infection.
Intake and Output	Designed to store, in the patient's electronic medical record, all patient intake and output information associated with a hospital stay or outpatient visit.
Laboratory	Supports General Laboratory, Microbiology, Histology, Cytology, Surgical Pathology, Electron Microscopy, Blood Donors, and Blood Bank for managing and automating the workload and reporting process.
Laboratory: Anatomic Pathology	Automates record keeping and reporting for all areas of Anatomic Pathology.

Application name	Description
Laboratory: Blood Bank	Uses data that can be tied primarily to a donor, a patient, or a unit of blood/blood component.
Laboratory: Electronic Data Interchange	Reduces or eliminates the need for manual ordering and reporting of laboratory results to interface laboratories.
Medicine	Allows entry, edit, and viewing of data for many medical tests and procedures.
Mental Health	Provides computer support for both clinical and administrative patient care activities associated with mental health care.
Nursing	Generates management reports on employees; accumulates daily statistics on the number of patients treated; generates reports on patients by bed section and ward; allows users to enter vital signs, height, and weight for patients; and allows users to generate intake and output reports.
Nutrition and Food Service	Integrates the automation of many Clinical Nutrition, Food Management, and Management Reports functions.
Oncology	Automates the tumor registry and supports tumor registrars in abstracting cancer cases, following up on cancer patients and producing the Hospital Annual Report.
Pharmacy: Automatic Replenishment/Ward Stock	Provides a method to track drug distribution and inventory management within a medical center.
Pharmacy: Bar Code Medication Administration	Provides a real-time, point-of-care solution for validating the administration of Unit Dose and intravenous medications to inpatients in medical centers.
Pharmacy: Consolidated Mail Outpatient Pharmacy	Provides a regional system resource to expedite the distribution of mail-out prescriptions to veteran patients.
Pharmacy: Controlled Substances	Provides functionality to monitor and track the receipt, inventory, and dispensing of all controlled substances.
Pharmacy: Drug Accountability/Inventory Interface	Works toward perpetual inventory for each VA medical facility pharmacy by tracking all drugs through pharmacy locations.
Pharmacy: Electronic Claims Management Engine	Provides the ability to create and distribute electronic Outpatient Pharmacy claims to insurance companies on behalf of VHA pharmacy prescription beneficiaries in a real-time environment.
Pharmacy: Inpatient Medications	Integrates functions from the Intravenous and Unit Dose modules to provide a comprehensive record of medications utilized during hospitalization of the veteran.
Pharmacy: Inpatient Medications – Intravenous	Provides pharmacists and their staff with IV labels, manufacturing worksheets, ward lists for order updates, and management report.
Pharmacy: Inpatient Medications –Unit Dose	Provides a standard computerized system for dispensing and managing inpatient medications.
Pharmacy: National Drug File	Provides standardization of the local drug files in all VA medical facilities.
Pharmacy: Outpatient Pharmacy	Provides a way to manage the medication regimen of veterans seen in outpatient clinics and to monitor and manage the workload and costs in the Outpatient Pharmacy.
Pharmacy: Pharmacy Benefits Management	Makes data extraction reports available at the medical centers and allows local management to use the data to project local drug usage and identify potential drug accountability problem areas.
Pharmacy: Pharmacy Data Management	Provides tools for managing site configurable data in pharmacy files.
Pharmacy: Pharmacy Prescription Practices	Provides medical centers with the ability to determine whether a patient has been seen at other VA facilities and to request current pharmacy information from those facilities prior to the patient appearing for a scheduled outpatient visit.

Application name	Description
Primary Care Management Module	In the outpatient setting, patients are assigned a primary care team and provider who are responsible for delivering essential health care, coordinating all health care services, and serving as the point of access for specialty care. This application allows a user to create, set up, and define teams; create and assign positions to the team; assign staff to the positions; assign patients to the team; and assign patient to providers' positions.
Prosthetics	Automates purchasing, provides control and auditing of expenditures, and generates management reports.
Quality: Audiology and Speech Analysis and Reporting	Used to enter, edit, and retrieve data for each episode of care.
Radiology/Nuclear Medicine	Automates the entire range of diagnostic functions performed in imaging departments, including order entry of requests, registration of patients for exams, processing of exams, recording of reports/results, verification of reports on-line, displaying/printing results for clinical staff, automatic tracking of requests/exams/reports, and generation of management statistics/reports, both recurring and ad hoc.
Remote Order Entry System	Used by clinicians to place orders for certain types of medical products and services that are maintained under contract by the Denver Distribution Center. The most substantial product line is custom hearing aids.
Scheduling	Automates all aspects of the outpatient appointment process.
Social Work	Is designed to facilitate the Social Work Service functions within a medical facility and is composed of Case Management, Clinical Assessment, and Community Resources.
Spinal Cord Dysfunction	Permits the identification and tracking of patients with a spinal cord dysfunction due to trauma or disease and the medical resources utilized during their treatment.
Surgery	Integrates scheduling surgical cases and tracking clinical patient data to provide a variety of administrative and clinical reports.
Surgery: Risk Assessment	Provides medical facilities a mechanism to track information relating to both surgical risk and operative mortality.
VistA Imaging System	Facilitates medical decision-making by delivering complete multimedia patient information to the clinician's desktop in an integrated manner.
VistA Imaging: Core Infrastructure	Includes the components used to capture, store, and display all types of images.
VistA Imaging: Document Imaging	Allows scanned and electronically generated documents to be associated with the online patient record and displayed on clinical workstations.
VistA Imaging: Filmless Radiology	Allows radiology departments to operate without generating X-ray film.
VistA Imaging: Imaging Ancillary Systems	Captures, stores, and displays images for a particular service or specialty.
Visual Impairment Service Team	Enables the Visual Impairment Service Team to easily manage and track activities and services provided to blinded veterans in their service areas.
Vitals/Measurements	Designed to store, in the patient's electronic medical record, all vital signs and various measurements associated with a patient's hospital stay or outpatient clinic visit.
Women's Health	To establish a computerized tracking system that generates aggregate data at the facility level. It would assist in the assessment of various aspects of care provided to women veterans.

Application name	Description
Management and Financial Systems	
Accounts Receivable	Automates the debt collection process and a billing module is available to create non-medical care debts.
Automated Information Collection System	Creates and prints encounter forms that display relevant clinical information, and provides for the entry of clinical encounter data for local and national needs.
Beneficiary Travel	Provides the ability to perform the functions involved in issuing beneficiary travel pay.
Compensation and Pension Records Interchange	Provides on-line access to medical data to Veterans Benefits Administration Rating Veteran Service Representatives and Decision Review Officers. It also creates a more efficient means of requesting compensation and pension examinations.
Current Procedural Terminology	CPT codes are used for reporting medical services and procedures performed by physicians. The software includes all CPT codes to code outpatient services for reimbursement and workload purposes.
Decision Support System Extracts	Provides a means of exporting data from selected VistA applications and transmitting it to a Decision Support System at the Austin Automation Center.
Diagnostic Related Group Grouper	Is based on the Medicare Grouper requirements as defined by the Health Care Financing Administration. Each DRG represents a class of patients who are deemed medically comparable and who require approximately equal amounts of health care resources.
Engineering	Facilitates the management of information needed to effectively discharge key operations responsibilities normally assigned to VA engineering organizations.
Equipment/Turn-in Request	Provides additional functionality within the Integrated Funds Distribution, Control Point Activity, Accounting and Procurement package.
Event Capture	Provides a mechanism to track and account for procedures and delivered services that are not handled in any other VistA package.
Fee Basis	Supports VHA's Fee for Service program, which is care authorized for veterans who are legally eligible and are in need of care that cannot feasibly be provided by a VA facility.
Generic Code Sheet	Allows code sheet data to be entered and transmitted electronically from the medical facility service level to the national database.
Incomplete Records Tracking	Provides the medical center the ability to monitor incomplete records, interim summaries, discharge summaries, and both inpatient and outpatient operation reports.
Integrated Funds Distribution, Control Point Activity, Accounting and Procurement	Automates a spectrum of VA financial activities. Provides users the capability to manage budgets, order goods and services, maintain records of available funds, determine the status of a request, compare vendors and items to determine the best purchase, record the receipt of items into the warehouse, and pay vendors.
Integrated Patient Funds	Automates the mini-banking system that VA provides for patients to manage their personal funds while hospitalized in a VA medical facility.
Integrated Billing	Contains all the features necessary to create bills for patients and third party insurance carriers.
Patient Care Encounter	Captures clinical data resulting from ambulatory care patient encounters.
Personnel and Accounting Integrated Data	Automates time and attendance for employees, timekeepers, payroll, and supervisors.

Application name	Description
Voluntary Service System	A national-level application replacing the site-based Voluntary Timekeeping System that tracks and manages the hours of service contributed by volunteers and volunteer organizations.
Cross-Cutting Monographs	
Duplicate Record Merge	Enhances the ability to associate appropriate data with a single patient identifier. It provides the tools necessary to automatically identify patient records identified as being duplicates.
Health Level Seven	This package enables M-based VistA applications running on core facility computer systems to exchange health care information with other computer systems. It provides messaging services and a single toolset for M-based VistA applications to create, send, receive, and process HL7 messages.
Kernel	A portability layer between the underlying operating system and application code. This enables the VistA system to be portable among different computers, operating systems, and M implementations.
Kernel Toolkit	Provides Development and Quality Assessment Tools, Capacity Planning Tools, and System Management Utilities.
List Manager	Provides an efficient way for applications to present a list of items to the user for action.
MailMan	An electronic messaging system that transmits messages, computer programs, data dictionaries, and data between users and applications located at the same or at different facilities.
Master Patient Index and Master Patient Index/Patient Demographics	This is a suite of applications that provides the ability to uniquely identify a patient and the facilities where that patient receives care. It is a foundation for the CPRS Remote Data Views that allows the clinician to retrieve clinical information from wherever the patient has received care.
My HealtheVet	Is a Web-based application that creates a new, on-line environment where veterans, family, and clinicians may come together to optimize veterans' health care.
Network Health Exchange	Provides clinicians quick and easy access to patients' information from any VA medical facility where a patient has received care.
Patient Data Exchange	Electronically requests and receives patient demographics, episodes of care, medications, and diagnostic evaluations from other VA facilities.
Remote Procedure Call Broker	Provides functionality so that graphical user interface developers can establish a connection from a client workstation to a VistA Server; fun remote procedure calls on the VistA M Server; and return data to the client workstation.
VA FileMan	The majority of VHA clinical data is stored in VA FileMan files and is retrieved and accessed through VA FileMan Application Programmer Interfaces and user interfaces.
VistALink	Provides a synchronous communication mechanism between M applications and rehosted applications, supporting VHA's ongoing transition to HealtheVet.
Registration, Enrollment, and Eligibility Systems	
Admission, Discharge, Transfer/Registration	Provides a comprehensive range of software dedicated to the support of administrative functions related to patient admission, discharge, transfer, and registration.
Clinical Monitoring System	Allows the user to design monitors that capture patient data in support of quality management efforts.

Application name	Description
Enrollment Application System	Facilitates the processing of an application for health benefits, which has been transmitted to the VHA site from the web-based software.
Hospital Inquiry	Provides the capability to request and obtain veteran eligibility data via the VA national telecommunications network.
Income Verification Match	Extracts patient-reported Means Test data and transmit it to the Health Eligibility Center.
Record Tracking	Provides for the maintenance and control of medical records and x-ray films to facilitate availability to a variety of users.
Resident Assessment Instrument/Minimum Data Set	Provides a standardized assessment tool supporting the completion of a comprehensive accurate and reproducible patient assessment, and serves as the basis for developing the patient's plan of care.
Veteran Identification Card	Replaces the embossed data card as a means of identifying veteran patients entitled to care and service at VA health care facilities.
Health Data Systems	
Automated Medical Information Exchange	Facilitates the electronic interchange of veteran information between Veteran Benefits Administration Regional Offices and VA medical facilities.
Incident Reporting	Supports VHA policy by compiling data on patient incidents.
Lexicon Utility	Used to express diagnostic clinical problems in easy-to-understand terminology and associate these terms to coding systems such as ICD, DSM, NANDA.
Occurrence Screen	Supports VHA policy by providing for the identification of events requiring follow-up review.
Patient Representative	Tracks and trends compliments and complaints and measures the facility's types of complaints as they relate to the Customer Services Standards and the National Patient Satisfaction Survey.
Information and Education Systems	
Automated Safety Incident Surveillance Tracking System	Designed to manage the data from all employee accidents, create a Report of Accident, and produce the Office of Worker's Compensation Programs Form CA-1 and the Federal Employee's Notice of Occupational Disease and Claim for Compensation Form CA-2.
Library	Automates the entire serials management process in VA Library Services.
Police and Security	Supports the VA Police in their responsibilities of crime prevention, preliminary investigation of crimes, apprehension, legally correct handling of suspected offenders, and the transfer of suspected offenders to appropriate authorities.

Source: VA.

Appendix IV: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

In addition to the contact named above, key contributions to this report were made by Barbara Oliver (Assistant Director), Barbara Collier, Neil Doherty, Nancy Glover, Michele Mackin, J. Michael Resser, Amos Tevelow, Eric Trout, and Charles Youman.

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