

Indian Health Service

Information Resources Management Plan 2003-2008

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Information Resources Management Plan 2003-2008**

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I. Executive Summary

Information technology (IT) is essential to support the primary goal of the Indian Health Service, to assure that comprehensive, culturally acceptable personal and public health services are available and accessible to American Indian and Alaska Native people. The components of the IHS IT system include people, hardware, software and communications capability and are essential to effective health care delivery and efficient resource management. To provide high quality care, all of the various, multidisciplinary healthcare providers in the Indian health system require accurate, timely and comprehensive information about the individuals and communities for whom they provide care.

The IHS Information Resources Management (IRM) Plan is revised annually and describes the agency's strategic goals for IT, key long-term initiatives and the annual performance goals that measure our progress. The IRM Plan is linked to IHS strategic objectives and annual IT performance goals, as described in the *IHS Strategic Plan*, published in 2002, and in the *IHS FY 2003 Performance Plan to Congress*, January 31, 2002. The IRM Plan conforms to the guidance issued by the Department of Health and Human Services (HHS).

A companion document to the IHS IRM Plan is the IHS Enterprise Architecture (EA), an integrated framework to align IHS IT maintenance, development and acquisition activities with IHS strategic business and information resource management goals and objectives. Annual performance goals are refined to reflect current priorities with guidance from the EA, the Information System Advisory Committee (ISAC) and various HHS working groups.

The Information Technology Support Center (ITSC) produces an Annual Work Plan that describes individual short-term projects that contribute toward meeting both annual and long-term IT goals. The individual project plans include task descriptions, schedules and milestones, and planned resources.

The core challenge for the IHS IRM program is to keep information technology products and services aligned to the agency mission and priorities. By reexamining IT long-term priorities annually within the context of constantly changing technologies and increased user needs, IHS can adjust its projects priorities.

II. Background

A. Overview of the Indian Health Service

The Indian Health Service (IHS), a Federal agency of the U.S. Public Health Service (USPHS), Department of Health and Human Services (HHS), has the responsibility for delivering health service to federally-recognized American Indians and Alaska Natives (AI/AN) through a system of direct Indian Health Service, tribal, and urban (I/T/U) operated facilities and programs based on treaties, judicial determinations, and Acts of Congress. The mission of the IHS, in partnership with American Indian and Alaska Native people, is to raise their physical, mental, social and spiritual health to the highest level. The agency goal is to assure that comprehensive, culturally acceptable personal and public health services are available and accessible to AI/AN people.

The IHS Strategic Plan, published in 2002, describes four overarching strategic goals for the IHS:

- Build health communities
- Achieve Parity in Access by 2010
- Provide Compassionate Quality Health Care
- Embrace Innovation

The I/T/U facilities and programs serve a population of about 1.46 million American Indian and Alaska Native people residing on or near reservations, and an additional 400,000 in urban areas. Close to 15,000 IHS employees, including USPHS Commissioned Corps and civil service, work with 557 federally recognized tribes in 35 states, from Alaska to Florida. Many of the people served by the Indian health system live in the most remote and poverty stricken areas of the United States. The health services provided by the I/T/U system often represents the only source of health care. Direct and contract emergency, inpatient and ambulatory care, although a mainstay of the community-based primary care system, is only a part of the IHS responsibility. With tribal participation, IHS also provides environmental planning and maintenance services; builds and maintains clean water systems; carries out health promotion, disease prevention and public health activities; and assists in research and application of scientific information.

The Indian health system integrates health services that are:

- delivered directly through IHS facilities;
- purchased by IHS through contractual arrangement with providers in the private sector; and
- Delivered through tribally operated and urban Indian health programs.

IHS direct health care services are administered through a decentralized system of 12 Area offices and 84 service units. The IHS operated 36 hospitals ranging from 11 to 170 beds; 63 health centers; 44 health stations; and five residential treatment centers. Indian tribes who have elected to administer their own health services deliver IHS-funded services to their own communities through 60 service units, encompassing 13 hospitals, 158 health centers, 160 Alaska village clinics, 76 health stations, and 28 residential treatment centers.

Additionally there are 34 urban health care programs, ranging from community health to comprehensive primary health care. In location where the IHS does not have its own facilities, or is not equipped to provide a needed service, the IHS contracts with more than two thousand private providers, including local hospitals, State and local health agencies, and individual health care providers.

B. The Role of Information Technology

To provide high quality health care, all of the various, multidisciplinary healthcare providers in IHS, Tribal and urban programs require accurate, timely, and comprehensive information about the individuals and communities for whom they provide care. Local through agency level program managers need access to this information for planning and management. Clinicians and administrators need this information for clinical and health systems research and analysis. Information technology is essential to providing this information.

In the most fundamental ways, information technology has transformed how we work. Front-line workers can have at their fingertips vast amounts of data that were once stored in patient charts and office files. Decision support systems can take employees through complex decision trees and logic. Customers can access remote information directly through integrated voice response system, electronic bulletin boards, and the internet. Management can communicate almost instantly with entire staff, without going through intermediate management layers.

The two components of IHS IT are software applications and the hardware and telecommunications infrastructure required to support and connect them.

C. Resource and Patient Management System (RPMS)

The Resource and Patient Management System (RPMS) is a distributed electronic healthcare information system that includes clinical, administrative, and financial information on patients and resources. Public Law 100-713, Indian Health Care Amendments of 1988, Title VI, Section 602 titled *Automated Management Information System*, mandated that the Indian Health Service establish an automated management information system that would include:

- Financial Management System (FMS)
- Patient care information system for each Area served by the IHS
- Privacy component that protects the privacy of patient information held by, or on behalf of, the IHS
- Service-based cost account component that provides estimates of the costs associated with the provision of specific medical treatments or services in each IHS Area Office.

Because RPMS is an integrated system, data that is recorded and entered at each of the various service points, regardless of where it is entered or which application is used (in the hospital, by a public health nurse during a home visit, or in outpatient pharmacy) is available to all of its software applications. This ensures that any of the various multidisciplinary providers who see a patient have quick and easy access to all pertinent information about that patient, including laboratory results, medications prescribed, physical complaints made to other providers – anything that has ever been recorded and entered about the patient's medical history.

In order to gather, store and display the breadth of required information for these various uses, RPMS consists of over 60 software applications, including:

- Patient-based clinical applications directly supporting health care programs, e.g., Patient Care Component (PCC) clinical data repository, Laboratory, Pharmacy, Behavioral Health System, Women's Health Care System, Radiology, Immunization, case management systems for Diabetes, Asthma and HIV, and others
- Patient-based administrative applications, e.g., Patient Registration, Scheduling, Scheduling, Referred Care, Third Party Billing, Contract Health Management, and others
- Financial and administrative applications automate financial, billing and inventory data, e.g., Administrative Resources Management System (ARMS), Financial Data Management System, Supply Accounting and Management System (SAMS), and others

The RPMS patient-based administrative and clinical applications are instrumental in the direct delivery of health care within the Indian health system as well as in supporting measurement of

clinical performance indicators by collecting decision support data for the IHS Annual Performance Plan to Congress.

IHS DIR maintains a centralized data warehouse for patient encounter and administrative data. Through the wide-area network (WAN), each health care facility exports select information about patient encounters to the national data repository. This allows the RPMS to store patient data in a core set of centralized files. The national database is used to provide reports for statistical purposes; performance measurement for GPRA and accreditation; public health and epidemiological studies.

D. IT Infrastructure

The IHS telecommunications infrastructure connects IHS, tribal and urban (I/T/U) facilities together and to the national data repository. The infrastructure is used for data transmission, voice traffic, and Internet/Intranet access. The capacity to support data transmission as well as new telehealth applications varies greatly and overall capacity needs to be upgraded. As IHS moves toward an application environment based on distributed objects, the need for I/T/U end users to flexibly access a robust, reliable, bandwidth-on-demand network backbone becomes critical.

The IHS WAN must support the integration of voice, data and video through installation of a robust, reliable, ubiquitous, bandwidth-on-demand wide area network based on SONET/ATM technologies. All WAN hardware must be fully redundant and support automatic failsafe capabilities. There must be at least two connections between the WAN and each local area network (LAN). This high quality network will be able to support distributed applications such as CPR, video conferencing and telemedicine, access to knowledge bases for clinical decision support and security mechanisms such as Public Key Infrastructure (PKI) and directory services.

III. IRM Strategic Planning

The strategic initiatives and long-term programs described in the IHS IRM Plan are derived from goals and objectives outlined in the *IHS Strategic Plan* and further detailed in the *IHS Annual Performance Plan to Congress*.

A. IHS Strategic Objectives and Strategies

While IT is an essential component in supporting all of the IHS strategic goals and objectives, the IRM program most directly support the following objectives and related strategies from the *IHS Strategic Plan*.

Objective 2.1 Effectively advocate for the health of American Indians and Alaska Natives

- IHS continues to develop the data capacity and performance management infrastructure to effectively manage programs and meet accountability requirements
- IHS nationally coordinates, and assists the I/T/Us in the provision of high quality, verifiable, and pertinent health and fiscal data.

Objective 3.1 Provide comprehensive and effective health care services

- IHS assists the I/T/U facilities in their ongoing development and integration of measurable clinical indicators into the health care delivery system to support the goal of decreasing health disparities.

Objective 3.2 Improve the safety and quality of health care

- The IHS, in conjunction with other programs within DHHS, continues to develop and support an appropriate medical error tracking system.
- The IHS ensures the development and availability of computerized provider order entry (CPOE) systems at point of care; facilitates the development and support for an electronic medical record system at point of care.
- IHS works to establish appropriate web-based patient and consumer health information; ensures ongoing and current access to best practices through Web-based interfaces; ensures wide area network (WAN) access to appropriate web-based medical knowledge resources for provider use.
- IHS clinical IT solutions make patient education documentation easier and more integrated into the delivery of care systems.

Objective 3.3 Provide quality health information for decision making to patients, providers and communities through improved information systems

- IHS works to ensure the availability of an integrated information system that can interface with non-RPMS applications.
- IHS continues to engage with other agencies in development of appropriate software applications (e.g., Federal Health Information Exchange (FHIE)).
- The IHS assures the deployment of a national Virtual Private Network to provide IHS business partners and employees with adequate and secure methods for remotely accessing IHS network resources; deploys regional firewalls to improve network security; implements a national antivirus gateway that improves network security; develops adequate security policies for the electronic sharing of patient information.
- IHS ensures that our IT solutions are HIPAA compliant.
- IHS continues to support and provide input into the medical IT standards community (e.g., LOINC, HL7)
- IHS assures the development of web-based application for patient-centric IT applications (e.g., IHPES/ORYX, GPRA)
- IHS develops and integrates cost accounting solutions into our clinical IT package, which will interface with finance, accounts receivable, billing, data entry, coding, medical record and patient registration, and will be compatible with PCC Plus, Envoy, Transworld, and Medicare/Medicaid electronic posting platforms

B. IHS Performance Plan

Two information technology-related performance indicators are described in the IHS Annual Performance Plan to Congress. The specific performance measures change annually but the overall goal remains the same:

- Implement a national program to improve the quality, accuracy and timeliness of Resource and Patient Management System (RPMS) data collection and reporting to support the IHS national clinical performance measures.

- Improve the Behavioral Health program's ability to collect and report data in order to track and evaluate improvements in the behavioral health status of American Indian and Alaska Native people.

C. IRM Vision, Goals and Strategic Objectives

Based on the agency's goals and strategies, the IHS IRM program vision is to provide universally accessible decision support information, which positively impacts the management and delivery of health care.

The overarching goals for IHS information resource management are:

- To improve timeliness, accuracy and quality of patient care activities, and
- To develop and deploy efficient electronic methods for managing patient information.

The IRM overall strategy is designed around a carefully structured blend of national, regional, and local site level responsibilities. This ensures that we use national program resources, when appropriate, to maintain economies of scale and uniformity of design, and that responsibilities are assigned to regional and local levels where those activities would and should have occurred at that level without national intervention.

The IRM strategic objectives that will enable IHS to demonstrate progress toward our goals are presented below. These objectives were identified in FY 2002 in conjunctions with the IHS Information Systems Advisory Committee (ISAC), an advisory body that represents the I/T/U customer base served by the IHS. The ISAC's purpose is to assure the creation of flexible and dynamic information systems that assist in the management and delivery of health care and contribute to the elevation of the health status of American Indian and Alaska Native people.

1. **Graphical User Interface (GUI) and Computer-based Patient Record (CPR):** Institute a graphical user interface (GUI) for the RPMS; institute a state-of-the-art Computerized Patient Record (CPR) with the ability to manage clinical alerts/pathways and contains data integrated from the various facilities that a patient has visited.
2. **Revenue/Generation/Cost Avoidance:** Provide an effective billing/general ledger system that is integrated into the IHS Health Information System.
3. **Data Quality and Accuracy:** Ensure accurate and high quality public health and administrative data for all I/T/Us.
4. **Caché Conversion:** Support the conversion from the current operating environment to Caché, a widely used database for health care, from Intersystems Corporation. This would enable continued support and development, and a clear growth path for GUI-based applications.
5. **Decision Support System:** Provide universally accessible decision support information that positively impacts the management and delivery of health care. This includes the Executive Information System Support (EISS) software application.
6. **Infrastructure and Architecture:** Maintain enterprise architecture to facilitate the improvement and growth of I/T/U information processing platforms and their interconnectivity, using standardized systems and processes.

7. **Security:** Design and provide methods and standards to assure the security and privacy of all patient related data that will meet or exceed HIPAA and other government security requirements.
8. **Interoperability:** Institute an open standards based information system for the I/T/Us to facilitate the interoperability with commercial systems.
9. **Cost Accounting:** Provide a quality cost accounting system that is integrated into the IHS Health Information System.
10. **Training (User and Technical):** Provide effective information technology and data management training at all levels.
11. **IT Research and Development:** Facilitate activities to look beyond current IT infrastructure, and explore new methods of connecting providers and managers with needed information.
12. **Telemedicine Coordination:** Provide a clearinghouse and coordination point for evolving telemedicine experience in the IHS. Facilitate activities to determine central points of repository for digital image files.
13. **Staffing:** Promote adequate staffing standards at all levels to support the information technology support functions.
14. **Tech Support (Help Desk):** Provide effective technical support for the current Health Information System.

D. IHS Enterprise Architecture (EA)

The IHS Enterprise Architecture (EA) is a key strategic planning component for IHS IRM. The EA is an integrated framework to align IHS information technology maintenance, development, and acquisition activities with IHS strategic business and information resource management goals and objectives. Therefore, this IHS EA applies to all IT activities performed and all assets deployed throughout IHS, including all information systems, software products, and infrastructure that support IHS management and operations. The EA supports and conforms to the strategic vision, business objectives, and EA principles and guidelines documented in the EA of IHS' parent agency, the Department of Health and Human Services (DHHS).

Specifically the EA:

- Presents a high-level architectural vision of a future IHS EA
- Identifies tactical initiatives for strategic investment that support the architectural vision
- Establishes a reference architecture model of IHS
- Aggregates and establishes a set of broadly applicable technical and security standards
- Presents a set of architectural models that depict the technical, operation, data and systems environments
- Provides guidance and recommendations for further development efforts to ensure their consistency with the architecture

Section 3.2.4 maps the IRM strategies listed above to specific short-term objectives.

IV. IRM Strategic Initiatives

A. RPMS Growth Path

RPMS is IHS' core patient management system. Plans are in place to take advantage of new messaging technologies as well as distributed computing architectures to continue to effectively use RPMS. Current development in both the government and commercial sectors will be used to support RPMS.

RPMS is well positioned to take advantage of technology and application developments in both the government and commercial sectors. One of the most significant improvements that any IT architecture can make is to enhance its interoperability capabilities. The main strategy that enterprises are taking is to move toward the widespread use of message-based inter-application and inter-site communication and data exchange. Improving the ability to exchange data is one of the primary strategies to achieve interoperability between RPMS and COTS solutions. Currently, RPMS can exchange data with COTS and GOTS through custom interfaces. Implementing standards to facilitate RPMS interoperability is fundamental.

Many commercial packages are interfaced or currently in the process of being interfaced with the RPMS using HL7 standards, including pharmacy, encoding, eligibility, patient identification, and billing packages. The ability to send data for an entire clinical encounter using an HL7 message has also been accomplished. In addition, adopting HL7 and X.12 messaging standards for data interchange will enhance the messaging capabilities and the ability to integrate COTS solutions. Future RPMS characteristics will include increased interoperability as well as the following characteristics:

- RPMS will be comprised of IHS-developed, VHA-developed, and COTS solutions, all communicating with each other and achieving interoperability via mature industry standards and technologies.
- RPMS will have a fully optimized billing capability and will have introduced a CPR system for point-of-care entry by providers.
- RPMS will be fully HIPAA compliant, including such features that all E-Health will be conducted over secure networks using a Public Key Infrastructure and standards based messages for claims submission.
- RPMS distributed applications will communicate with each other using various technologies such as CORBA, Component Object Model (COM)+, and the Extensible Markup Language (XML) and access services via a Common Service Architecture (CSA).
- State-of-the-art hardware and telecommunications technologies will be employed to provide required bandwidth.
- Increased use of architectures, such as symmetric multiprocessing (SMP) or clustering technology, will be required to handle increased workloads.
- Wireless communications will be needed to provide better point-of-care access, using hand-held entry and display devices to increase data access while increasing provider mobility.

The IHS will continue to develop and improve existing health information systems. Introducing and using these technologies and standards will allow RPMS to respond faster to future business drivers and achieve IT goals. Projects that are presently being undertaken are electronic data interchange and code sets required by the HIPAA regulations; development and deployment of provider order-entry to promote patient safety; Point-of-Sale pharmacy billing to improve collections and decrease time to billing; and improved generic interface systems (GIS) to allow data exchange with the Health Care Financing Administration and the States (for immunization registries).

B. IHS E-Health Initiative

The Indian Health Service (IHS) E-Health Initiative was proposed to DHHS as a special funding request to help the Indian health system refine and expand its information technology infrastructure to improve health status monitoring, health care quality and efficiency, and financial management of IHS. At the same time, this initiative will produce open source products and lessons learned from the implementation process to share with a broader audience, such as community health center clinics. The components of the E-Health Initiative are:

1. A software package that includes an easy to use graphical user interface, enhanced clinical features and decision support tools for improved clinical management of those chronic diseases deemed most critical for the AI/AN population.
2. An implementation guide that includes both technical guidance on the software and hardware and guidance on the business process re-engineering, clinic staff training and other implementation steps necessary to successfully manage the organizational change that occurs when such information technology systems are integrated into health care delivery.
3. An evaluation of the success of the implementation process, and an analysis of the impact the system has on health indicators.

This initiative will demonstrate how electronic health systems can be used in small clinical settings and rural locations with limited technical and financial support (akin to the majority of primary care sites across the country.) Furthermore, it will show how e-health can improve the delivery of preventive services and assist in the management of chronic disease conditions to help patients remain healthy and out of the hospital.

C. Information Technology and Clinical Performance Improvement

RPMS is an essential component in meeting IHS Strategic Plan Objective 3.3: Provide quality health information for decision making to patients, providers and communities through improved information systems. RPMS directly contributes to the agency's mission of raising health status and decreasing health disparities by presenting providers with automated tools for:

- documenting and reporting clinical data to support patient care decisions;
- improving compliance with clinical guidelines; and
- integrating measurable clinical indicators into the health care delivery system to assess clinical performance improvement.

The IHS IRM program vision is to provide universally accessible decision support information, which positively impacts the management and delivery of health care. IHS has identified five chronic diseases as representing the agency's long term measures of improved health status through increased compliance with clinical practice guidelines. These chronic diseases are: diabetes, obesity, cardiovascular disease (CVD), asthma, and HIV/AIDS. IHS has three main long term approaches to achieve this vision.

- Implement a true computer-based patient record that retrieves as well as captures clinical data as close to the point of care as possible.
- Augment the existing RPMS clinical functions by developing new software modules, adding to existing ones, and enhancing clinical reminders and other decision support functions.
- Achieve fully automated clinical performance reporting for both process and outcome measures at local and national levels.

Several IRM long term projects contribute to achieving these goals.

Electronic Health Record (EHR): IHS will deploy an EHR to all IHS direct sites by FY 2008 that includes decision support for five chronic diseases identified by IHS.

An electronic health record is a tool that helps providers manage all aspects of patient care by providing a full range of functions for data retrieval and capture to support patient review, encounter and follow up. Although RPMS has substantial patient care components, including the Patient Care Component (PCC) clinical data repository, it was not designed primarily for point of care provider interaction. Recommendations from the Institute of Medicine's (IOM) recent reports on computer-based patient records and patient safety will be used to guide decisions about enhancements to RPMS EHR. A key element of a successful EHR is incorporating a provider-tested graphical user interface (GUI). ITSC will continue to test and deploy a component-based technical solution.

Behavioral Health System: IHS will enhance existing software into a fully integrated behavioral health system by FY 2004 and deploy to all IHS direct sites by FY 2008.

Improving behavioral health outcomes relies on two important activities: data collection as close to point of care as possible, and data reporting in a standardized way that can be understood across the Indian health system. The Behavioral Health System Improvement initiative is an iterative, multi-phased project with the ultimate goal of developing and deploying software that integrates all behavioral health functions. An important clinical element of the system will be improved collection and evaluation of suicide data. The measurement of treatment effectiveness with such tools as GAF or Axis V scores is also a key component in the provision of behavioral health services.

Case Management Systems Enhancement: By FY 2006, IHS will complete development of case management or other decision support software for the five key chronic diseases identified by IHS.

Case management software is used to identify patients with similar health problems and maintain them in registers for providers to manage their specific needs. ITSC will develop and deploy two specialty systems: the Asthma Register System (ARS) in FY 2003 and the HIV/AIDS Case Management System (HCMS) in FY 2004. The existing Diabetes Management System will be

enhanced in FY 2004. The need for specific software for cardiovascular disease management and obesity management will be evaluated in FY 2003.

Joslin Vision Network: IHS will continue to participate with the Joslin Diabetes Center to deploy the Joslin Vision Network (JVN), a telemedicine program to remotely obtain and review retinal examinations for diabetic patients. The rate of diabetic retinopathy for patients diagnosed with diabetes is a GPRA clinical indicator. IHS anticipates increasing deployment of JVN to one site per month.

Clinical Indicator Reporting System (GPRA+): By FY 2005, all RPMS-based GPRA clinical indicators will be reported electronically. IHS will continue to update GPRA+ or related applications annually to reflect changes in clinical guidelines and to add developmental indicators.

The GPRA+ Clinical Indicator Reporting System (GPRA+) is an RPMS application designed for local and Area monitoring of clinical performance indicators on a quarterly basis and to produce annual required performance reports. GPRA+ enables IHS to produce the standardized government healthcare performance measurement set recommended in the recent Institute of Medicine report *Leadership By Example*. Because GPRA+ is a passive data collection system, IHS can add new clinical performance measures in a cost effective way, without imposing additional data collection burdens on staff.

Data Warehouse: IHS will deploy phase I of the data warehouse by FY 2004.

In the spring of 2001, IHS initiated a project to design and build a data warehouse solution that will provide information, reporting and analysis resources to a range of agency stakeholders. The data warehouse is a state-of-the-art system for gathering, storing and reporting information to the various components of the Indian health system. The first production version will provide a relatively complete historical repository of patient registration and encounter information back through October 2000. The clinical data mart will eventually support predefined reports (e.g., IHPES/ORYX and GPRA) as well as ad hoc queries at local, Area and national levels.

Patient Care Component (PCC) Enhancements: Ongoing.

PCC is essentially the clinical data repository for the RPMS components and includes patient and visit information. ITSC will continue to enhance PCC at least annually by adding fields and functions that improve our clinical data collection and reporting capabilities. Some key clinical enhancements are significant improvements in health factor collection for alcohol and domestic violence screening; improving patient education codes to meet JCAHO requirements; adding fields to support HRSA UDS reporting requirements; and other initiatives.

C. Information Technology Infrastructure and Office Automation

The IHS telecommunications infrastructure connects IHS, tribal, and urban (I/T/U) facilities together and to the national data repository. This infrastructure is used for data transmission, voice traffic, and Intranet/Internet access. The capacity to support data transmission as well as new telehealth applications will require increased overall capacity. The need to improve security and manage the infrastructure is being addressed through deployment of regional firewalls to improve network security; activation of the national antivirus gateway to prevent email borne computer viruses; deployment of a national Virtual Private Network to provide IHS business partners and employees a secure method for remotely accessing IHS network resources; and the

installation of Enterprise Information Management tools such as Peregrine's Infotools (IDN and DDN) to improve management of the network.

D. Information Technology Architecture and Planning

The RPMS financial and administrative applications include software that automates financial, billing, and equipment inventory/repair processes. These applications support third party revenue generation, national equipment inventories reporting, and provide information in the development of the IHS budget. However, non-RPMS applications such as materiel, financial and personnel management systems are not fully integrated. IHS will continue efforts to integrate RPMS systems with other commercial and governmental applications through the use of current technology. This will allow IHS to achieve sound business practices such as; actuarial and cost reporting, enhanced revenue generation, cost containment, and work efficiencies and benchmarking comparisons.

Overall IHS seeks to improve the IT infrastructure through: improvements to data quality; accuracy and precision through upstream edits and user tools; improved architecture of the database; and direct user access for epidemiologists, statisticians and other health professionals to provide health care trend analysis.

The DIR develops and tests new software and then distributes the RPMS application suite to IHS Headquarters, Area Offices and other federal partners. Each Area Office releases the RPMS application suite to the appropriate hospitals, clinics, health aid, and State public health nursing sites

The IHS participates in an on-going joint effort with the Department of Veterans Affairs in the development of software and sharing of technology resources. Recently, this federal health care collaboration has included both VA and Department of Defense on the Federal Health Information Exchange (FHIE) (formerly called the Government Computer-based Patient Record (GCPR) Framework) project. This collaboration is reflected in the IHS IT Architecture and forms the basis for the IHS five-year plan.

E. Security

The IHS is responsible for securing information that it collects, records, transmits, and uses in the performance of its mission. Since this information includes agency sensitive information, such as personnel and financial records, as well as individually identifiable health information, it is necessary to establish the conditions and rules under which the IHS electronic systems and networks will operate to ensure the confidentiality, integrity, and availability of the information. This is especially critical in the healthcare environment, where healthcare personnel must balance the requirement for patient privacy along with the requirement to provide sufficient data to healthcare professionals and Government agencies in support of their missions and responsibilities to improve health care in the United States.

The IT Security Architecture is based on the Chief Information Officers' Council Federal Enterprise Architecture Framework and provides guidance for protecting IHS' business assets: systems, software, and information resources. The key goal of the information security architecture is to provide uniform secure information delivery to any authorized system or user, at any time, to any place, over any path, while ensuring patient privacy, data integrity, confidentiality, and availability

The target IHS Security Architecture is defined within the context of six areas required by HIPAA. These areas include technical; physical; administrative and procedural protection; event logging and auditing; personnel training and awareness; and intrusion and incident response detection. The basic philosophy behind the IHS Security Architecture is to secure components and secure the data communications. The measures listed in the following section are designed to enhance the security of these components.

F. Enterprise Initiatives

IHS IT projects will be developed, implemented, and operated using standard, enterprise-wide policies, methods, tools, and techniques. Enterprise Information Management, Human Resources, Financial and other systems are being initiated within DHHS and across government. Adherence to this principle will allow IHS to do the following:

- Maximize benefits from sharing IT resources, such as people, hardware, design techniques, tools, languages, and documentation
- Provide a comprehensive picture of resource use throughout the IT project development life cycle
- Implement repeatable software development processes; promote re-deploying staff with minimal re-training; and minimize the implementation and maintenance costs to develop IT projects

Adhering to this principle requires IHS to do the following:

- Train staff and adjust resources to make them consistent with adopted methodologies
- Change the organizational culture to embrace adopted methodologies
- Employ modern systems development methods, such as rapid applications development and object-oriented design, tools, and techniques in addition to traditional structured practices
- Document and promulgate adopted methodologies
- Conduct methodology compliance reviews and use sanctions for non-compliance with established methodologies
- Plan and budget for increased up-front development costs and time

V. Annual Performance Planning

A. ITSC Annual Work Plan

The IRM Plan describes the outcome and major milestones for priority projects but does not describe in detail how the goal will be accomplished. The Information Technology Support Center (ITSC) produces an Annual Work Plan that describes individual short-term projects that contribute toward meeting both annual and long-term IT goals. The individual project plans for software and infrastructure projects include task descriptions, schedules and milestones, and planned resources. Project leads meet monthly to discuss status, identify issues, and reprioritize as needed. The Annual Work Plan incorporates any project activity that will contribute toward

meeting specific annual performance measures defined in the IHS Annual Performance Plan to Congress.

B. IHS FY03 Annual Performance Plan

As previously noted, the IHS Annual Performance Plan describes two information technology-related performance indicators that address the development of improved automated data capabilities that support clinical care and performance measurement.

Indicator 17: During FY 2004, implement a national program to improve the quality, accuracy and timeliness of Resource and Patient Management System (RPMS) Patient Care Component (PCC) clinical data to support the Agency’s GPRC clinical measures by:

- a) Implementing a “regional” RPMS PCC “data quality” assessment training at each IHS regional office;
- b) Expand the current automated data quality assessment package to include two new additional clinical measures.

Indicator 18: During FY 2004, improve the Behavioral Health (BH) Data System by:

- a) Assuring at least 55% of the I/T/U programs will report minimum agreed-to behavioral health-related data to the national data warehouse;
- b) Increasing the number of I/T/U programs utilizing any behavioral health data reporting systems by 5% over the FY 2003 rate.

C. Key Project Milestones

	Project	FY03 Milestone(s)
GUI	Electronic Health Record (EHR) Phase I	Define baseline technical approach Initiate alpha testing
	Behavioral Health GUI	Deploy GUI for BHS v. 3.0
	Patient Chart	Deploy version 1.3
Revenue Generation/Cost Avoidance	Pharmacy Point of Sale	Continue implementing at minimum two sites monthly. Deploy HIPAA Compliant POS NCPDP v. 5.1
	Pharmacy Enhancements	Deploy Inpatient Medications v. 4.5, Pharmacy Data Management, Adverse Reactions Tracking v. 4.0, National Drug File v. 4.0,
	Medicaid Eligibility	Complete HIPAA compliant state Medicaid interface for several states (TBD)
	Accounts Receivable and Third Party Billing Enhancements	Deploy A/R v. 1.7 Integrate HIPAA requirements
	PCC+ Customizable Encounter Form	Deploy version 2.2 Continue deploying to two sites each month
Data Quality and Accuracy	GPRC+ Clinical Indicator Reporting System	Deploy GPRC+ FY03 with enhanced report functions and additional developmental indicators

	Project	FY03 Milestone(s)
	Integrated Behavioral Health System	Deploy Behavioral Health System v. 3.0 (interim solution) Complete functional requirements and design Integrated Behavioral Health System
	LOINC Deployment	Complete LOINC automated mapping pilot. Deploy LOINC to 23 additional sites.
	Data Warehouse Phase II	Begin loading data late summer/fall of 2003 Integrated step-wise loading and testing of data over 8 months
	Data Quality Assessments and Improvement	Continue annual Orientations to each Area on GPRA and Clinical Performance Measures Expand data assessment trainings
Caché Conversion	Caché Conversion	Convert 3 sites per Area (9 of 12 Areas)
Decision Support Systems	Case Management Systems	Deploy Asthma Register System Identify requirements and design HIV Case Management System
	Executive Information Support Systems	Implement EISS interface to ARMS, training and travel data Expand to present local clinical performance indicator data (GPRA+)
	Obstetrics Evaluation	Evaluate functional requirements for RPMS Obstetrics component
	Micromedex Deployment	Purchase and deploy
Infrastructure and Architecture	Visit File 200 Conversion	Complete implementation at all RPMS facilities.
	Fileman 22 Upgrade	Deploy to all sites
	Enterprise Architecture	Complete FY04 EA
	LAN/WAN Enhancements	Upgrade routers in each area to include data compression and data encryption
	Patient Information Management System (PIMS) v. 5.3	Deploy phase I: MAS enhancement Deploy phase II: PIMS v. 5.3 to Alpha and Beta Sites
	Internet/Intranet Enhancements	Increased Bandwidth to Six Megabytes/second
	E-mail Server Consolidation	Initiate consolidation process
	Windows 2000 Migration	Migrate National Programs Albuquerque and Headquarters East
Security	FRA and GISRA Task Identification and Completion	Complete all tasks identified by Facilitated Risk Assessment (FRA) and GISRA evaluations
	Continuity of Business Operations Plan (COOP)	Develop COOP
	Network Intrusion Monitoring	Deploy to all Areas
	VPN Enhancement	Deploy to all Areas
	Verisign Implementation	Implement Verisign Certificate Authority

	Project	FY03 Milestone(s)
	Disaster Recovery Plan and Systems	Complete plan Implement for ARMS, Exchange and other critical IHS databases
Interoperability	Master Person Index (MPI) Pilot	Initiate pilot
	HIPAA Electronic Data Interchange (EDI) Deployment	Complete and deploy interface to all sites for EDI transactions.
	Immunization Data Exchange	Develop two-way data exchange between states and IHS
	Dispensing System Automated Interface for Pharmacy and Supplies	Deploy to Alpha and Beta sites
	Laboratory: Instrument Interfacing Enhancements	Deploy to all Facilities
	Laboratory Interface to Reference Labs	Deploy to Alpha and Beta sites
	RPMS 3M HDM Interface	Deploy to Alpha and Beta sites
	Integration Engine Deployment and Data Movement Enhancement	
Telemedicine Coordination	Joslin Vision Network Diabetes Eye Care Project	Complete Phase II
Tech Support (Help Desk)	Peregrine Service Center Installation	Deploy client software to the Area offices.