

# **Strategic Options for the Modernization of the Indian Health Service Health Information Technology**

## **Roadmap**

### Executive Summary

October 2019

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## 1.0 Purpose of Roadmap

The IHS HIT Modernization Project Roadmap provides guidance to the Department of Health and Human Services (HHS) and the Indian Health Service (IHS) in their efforts to modernize the IHS health information technology (HIT) system. The Roadmap is an overarching plan to support improved clinical and non-clinical operations across IHS, Tribal, and Urban (I/T/U) healthcare facilities through HIT. It identifies key improvement opportunities, related work initiatives for implementing such opportunities, and estimated timelines and performance indicators.

The Roadmap is derived from a synthesis of best practices in HIT Modernization efforts as well as findings and recommendations from the current Modernization Project work. The Roadmap is a technology-agnostic strategic and decision-support tool, designed to guide the overarching modernization strategy, whether it be upgrade of the existing HIT system, selection of a commercial-off-the-shelf (COTS) product, or a hybrid of the two. The Roadmap is aligned with IHS' goals and strategic plan.

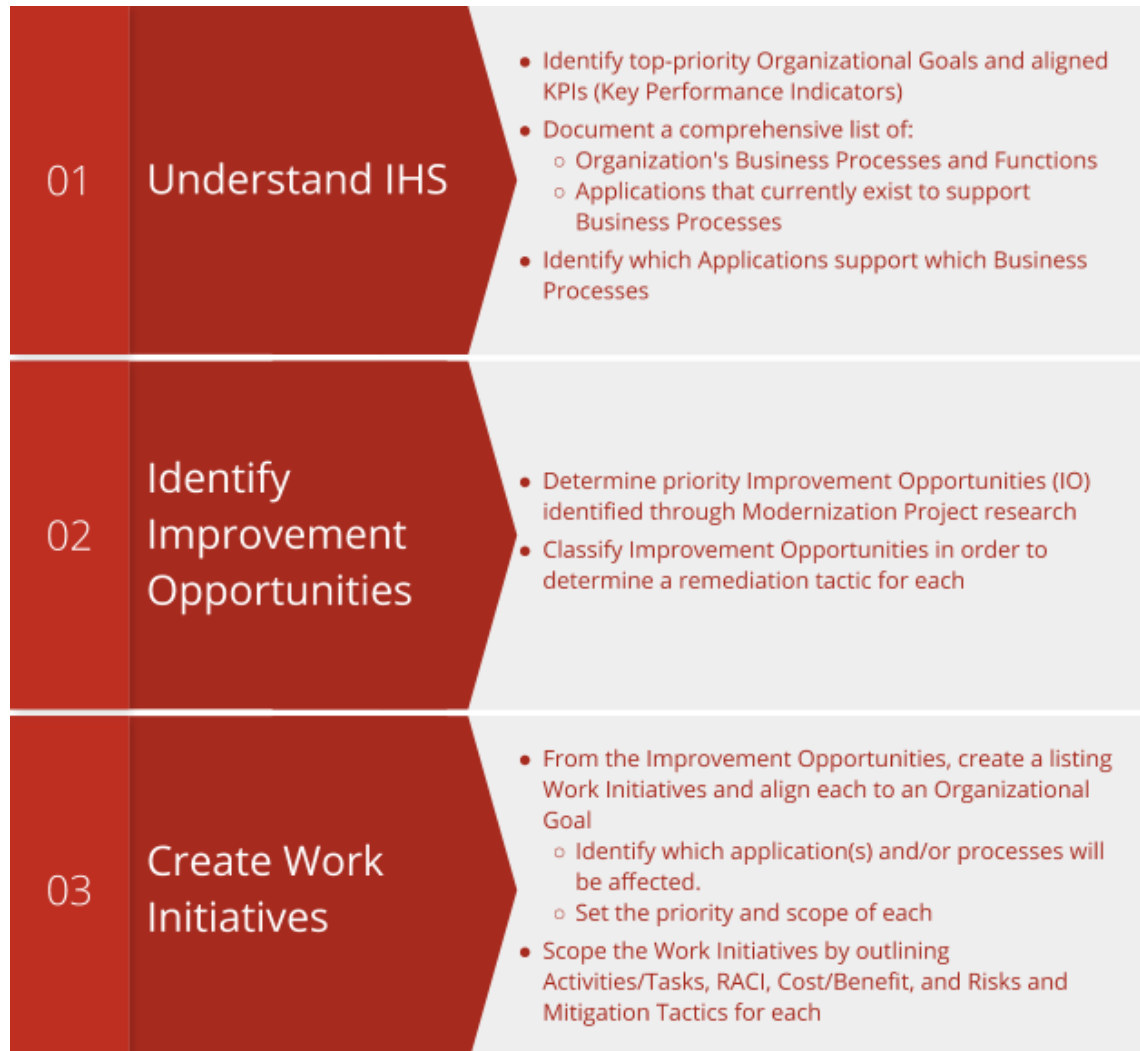
The Roadmap team made up of tribal, federal and private industry stakeholders recommends that the IHS incorporate a human-centered design approach when using the tool, as well as an iterative methodology to maintaining and revising the Roadmap. The human-centered design approach, a cornerstone of the Modernization Project, places people at the center of the process when fulfilling critical requirements.



## 2.0 Roadmap Tool Development

The Roadmap team efforts have produced an Enterprise Architecture Roadmap Tool that can guide the IHS towards HIT Modernization. This tool was constructed using the following steps:

**Figure 2.0-1 Steps to Roadmap Development**





### 3.0 Goals of Roadmap: Moving IHS towards HIT Modernization

The Roadmap includes four key domains. These domains are defined as follows:

Figure 3.0-1 Four Key Roadmap Domains

Four Key Roadmap Domains for IHS HIT Modernization		
<p><b>Modernization Planning and Execution</b> <i>Strategic Design and Action to Achieve HIT Modernization</i></p>	<ol style="list-style-type: none"> <li>1. Establish governance, Program Management Office (PMO), and communication plan</li> <li>2. Select and acquire HIT solution</li> <li>3. Execute and Implement</li> </ol>	<ul style="list-style-type: none"> <li>• Planning and execution are long, complex processes</li> <li>• Execution requires interaction with the Data Exchange and Infrastructure domains</li> </ul>
<p><b>RPMS Stabilization and Early Wins</b> <i>Develop and Deploy Key Improvements to RPMS</i></p>	<p>Address immediate end user requirements to adequately support business needs and provide adequate care to the population served by IHS</p>	<ul style="list-style-type: none"> <li>• Short-term stabilization must occur regardless of HIT system(s) chosen</li> <li>• Achieves "Early Wins" via immediate intervention and ongoing modernization</li> </ul>
<p><b>Data Exchange</b> <i>Address Inter- and Intra-Operability Requirements</i></p>	<p>Develop data exchange capability and provide a secure personal health record (PHR) electronic application vitally important to fluid populations</p>	<ul style="list-style-type: none"> <li>• Delivers a universal healthcare requirement</li> <li>• Essential to AI/AN populations</li> </ul>
<p><b>Infrastructure</b> <i>Improve Technology to Support Current Needs and Future HIT</i></p>	<p>Make required updates to the hardware, software, networks, data centers, and equipment used to develop, test, operate, monitor, and manage technology services.</p>	<ul style="list-style-type: none"> <li>• Assess current infrastructure state at I/T/U facilities</li> <li>• Improve infrastructure to meet baseline requirements for selected HIT system(s)</li> </ul>



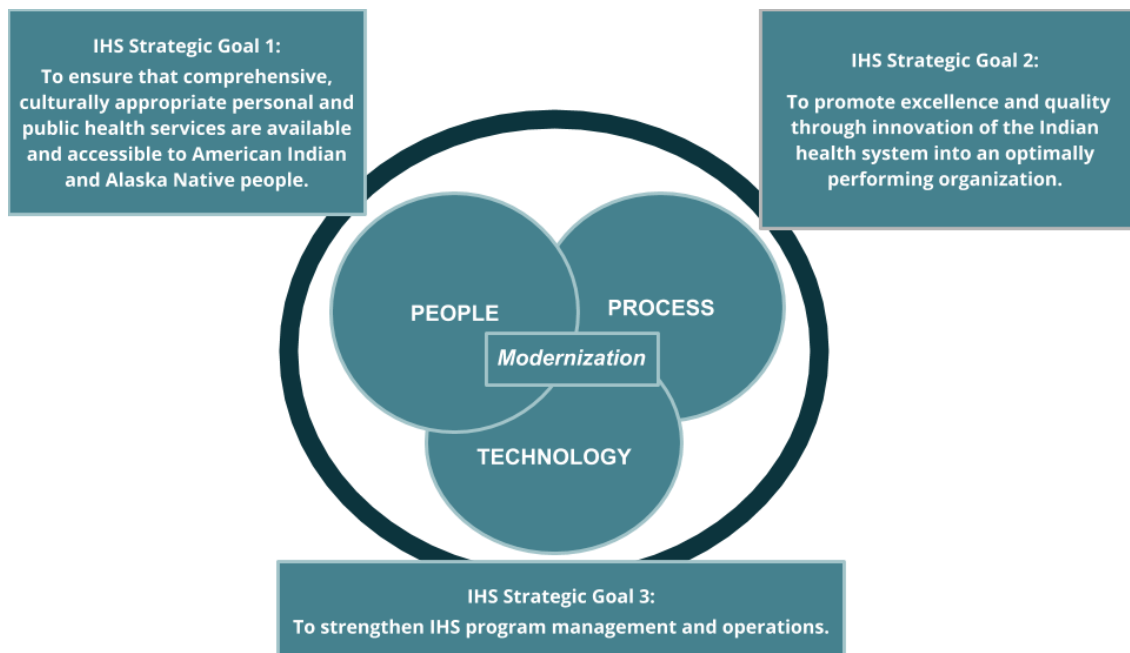
## 4.0 Objectives, Activities, Milestones, and Stakeholders

Each domain is comprised of multiple objectives, activities, and milestones that contribute toward the success of each respective domain and of the entire HIT modernization effort.

### 4.1 Key Performance Indicators

The IHS organizational goals from the Strategic Plan FY 2019-2023<sup>3</sup> that were selected for inclusion in this Roadmap are displayed in the graphic below. In conjunction with the IHS HIT Modernization project framework, the Roadmap was created with a people, process, and technology paradigm.

**Figure 4.1-1 IHS Strategic Goals with a People, Process, and Technology Paradigm**





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Key performance indicators (KPIs) are consistent with the IHS’ organizational goals and drive the Roadmap strategy. Each KPI is mapped to one or more organizational goal and is addressed in one or more Roadmap domain.

**Table 4.1-1 KPI Crosswalk with Organizational Goals and Roadmap Domains**

Org Goal	Key Performance Indicator (KPI)	Modernization Planning and Execution	RPMS Stabilization and Early Wins	Data Exchange	Infrastructure
2	KPI-001: Improved health status for AI/AN people receiving care from IHS	✓	✓	✓	
2	KPI-002: All IHS facilities will achieve and maintain recognition as Patient Centered Medical Homes	✓		✓	
1	KPI-003: Improved access to services for AI/AN people seeking care from IHS	✓		✓	✓
1, 3	KPI-004: Improved patient engagement through electronic access to health information	✓		✓	
3	KPI-005: Improved interoperability and sharing of patient information within the organization, across the I/T/U and with private and government partners (e.g. VA)	✓		✓	
2	KPI-006: Improved quality of care provided by IHS, as demonstrated by government and industry benchmarks	✓			
3	KPI-007: Improved organizational maturity in use of information technology systems in service of the IHS mission	✓			✓
3	KPI-008: All sites successfully complete and regularly update a Security Risk Analysis	✓	✓		
3	KPI-009: Improved ability for IHS to provide services in a sustainable way through cost recovery	✓			
3	KPI-010: Provider satisfaction with HIT usability.	✓	✓	✓	✓

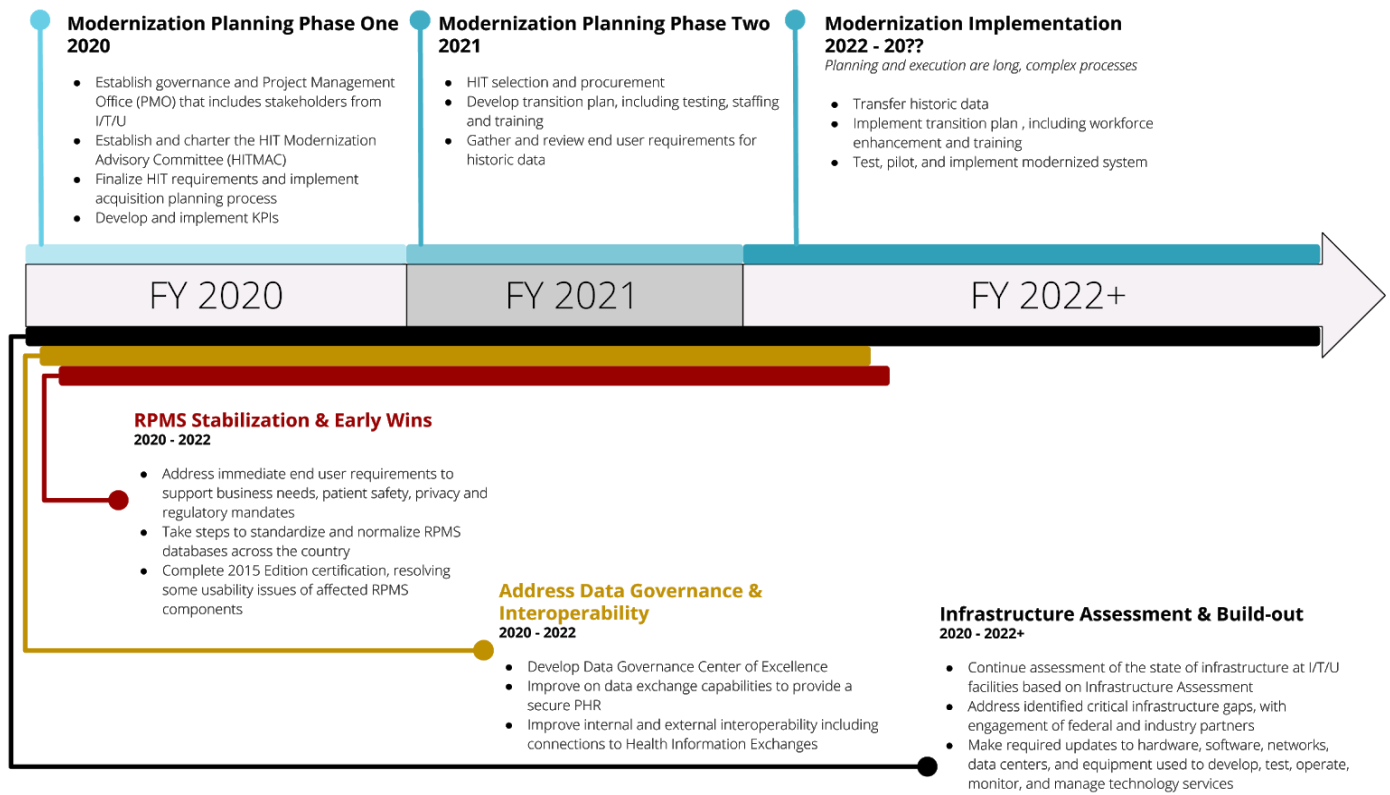


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## 4.2 Work Initiatives

The Roadmap leverages IHS processes, supporting applications, and improvement opportunities to generate work initiatives (WIs), which are specific actions required to achieve IHS HIT modernization. A high-level program plan is displayed in Figure 4.2-1.

**Figure 4.2-1 High Level Program Plan and Timeline**







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## 4.3 Stakeholders

Each Work Initiative will be assigned one or more suggested key individuals or groups to be responsible, accountable, consulted, or informed about the effort. The Roadmap displays each stakeholder's proposed involvement and role in each Work Initiative. The HIT Modernization Program will need to engage with these stakeholders as it moves toward modernization. The list below presents some of the proposed stakeholder roles that should ideally be engaged in this program.

**Table 4.3-1 Proposed Stakeholder Roles**

IHS Leadership	IHS Boards and Committees	I/T/U Representation
<ul style="list-style-type: none"> <li>● IHS Director</li> <li>● IHS Chief Medical Officer (CMO)</li> <li>● IHS Chief Information Officer (CIO)</li> <li>● IHS Chief Technology Officer (CTO)</li> <li>● IHS Enterprise Architecture (EA)</li> <li>● IHS Chief Information Security Officer (CISO)</li> <li>● IHS Chief Health Informatics Officer (CHIO)</li> <li>● IHS Chief Medical Informatics Officer (CMIO)</li> <li>● IHS Privacy Officer</li> </ul>	<ul style="list-style-type: none"> <li>● IHS Clinical Governance Boards</li> <li>● IHS Technical Governance Boards</li> <li>● Information Systems Advisory Committee (ISAC)</li> </ul>	<ul style="list-style-type: none"> <li>● I/T/U Field</li> <li>● Tribes / Urban Programs</li> </ul>
Federal Partners		Project Management Office (PMO) and Modernization Team
<ul style="list-style-type: none"> <li>● HHS Chief Information Officer (CIO)</li> <li>● HHS Chief Technology Officer (CTO)</li> <li>● HHS Chief Information Security Officer (CISO)</li> <li>● HHS Customer Experience Lead</li> <li>● HHS Chief Privacy Officer (CPO)</li> <li>● Other federal partners including:               <ul style="list-style-type: none"> <li>○ Veterans Affairs (VA)</li> <li>○ Department of Defense (DoD)</li> <li>○ Office of the National Coordinator (ONC)</li> <li>○ Centers for Medicare &amp; Medicaid Services (CMS)</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>● External Advisory Board</li> <li>● Steering Committee</li> <li>● PMO Exec Director</li> <li>● PMO Program Manager</li> <li>● PMO Staff</li> </ul>



## 5.0 Next Steps

The Roadmap will evolve to meet the HIT Modernization Program needs. The Roadmap is a launching point for IHS HIT modernization. The Roadmap is to be referenced and updated on a regular basis as information is gained and funding is acquired.

To facilitate growth and evolution of the Roadmap, ownership by the Department of Health and Human Services (HHS) is required. HHS should initially adapt the model to IHS needs as appropriate. It should later oversee the execution of Roadmap steps, ensuring a coordinated and comprehensive approach to HIT modernization.

Broad-based clinical and technical leadership commitment is essential to implementation and success of this endeavor. Leadership must fully understand and commit to the Roadmap to ensure a successful modernization effort. Once leadership commitment is secured, communication to the I/T/U of the Roadmap's next steps is crucial to generate buy-in and further coordinate the modernization effort. Transparency and responsiveness to I/T/U concerns are key for preparing for modernization of a health enterprise as large as IHS. The modernization effort belongs to them as well as to IHS and HHS.

The Roadmap outlines immediate steps that should be taken to set the modernization effort into motion.

**Table 5.0-1 Roadmap Next Steps**

Domain	Next Steps
Modernization Planning and Execution	<ul style="list-style-type: none"><li>● Reassess the organization of HIT governance processes within the agency</li><li>● Fill critical vacancies within IHS's Office of Information Technology</li><li>● Establish and charter the HIT Modernization Advisory Committee (HITMAC)</li><li>● Execute an acquisition for expert Program Management Office support</li></ul>
RPMS Stabilization and Early Wins	<ul style="list-style-type: none"><li>● Take steps to standardize and normalize RPMS databases across the country</li><li>● Complete 2015 Edition certification, resolving usability issues of affected RPMS components to the extent possible</li></ul>
Data Exchange	<ul style="list-style-type: none"><li>● Improve Internal and External Interoperability, including connections to Health Information Exchanges serving appropriate states and federal agencies</li></ul>
Infrastructure	<ul style="list-style-type: none"><li>● Address identified critical infrastructure gaps, engaging federal and industry partners</li></ul>



## 6.0 Risks, Constraints, and Mitigations

### 6.1 Risks and Mitigations

Several key risks warrant consideration and mitigation when using the Roadmap:

Risks	Proposed Mitigations
<p><b>Operating Model Integration:</b> If the Improvement Opportunities identified and related Work Initiatives are not integrated into IHS' operating model, then the modernization program may fail due to an unclear vision or deficient execution.</p>	<p>The HIT Modernization team will brief Executive leadership and senior staff on key elements of the Roadmap, including identified improvement opportunities, proposed work initiatives to remediate cited deficiencies, attendant risks, and interdependencies. Such briefings shall be iterative and interactive.</p>
<p><b>Executive Sponsorship:</b> If IHS' executive leadership, senior staff, and domain and subject matter experts are not fully engaged and involved in the review, adoption, and evolution of the Roadmap, then the modernization program may fail due to a lack of executive sponsorship, buy-in and resistance to change.</p>	<p>Executive leadership and senior staff will be engaged in the review and refinement of key elements of the Roadmap, focusing on the identification of improvement opportunities, proposed work initiatives to remediate cited deficiencies, attendant risks, and interdependencies. Such interactions shall be iterative, and last for a period spanning hand-off of the Roadmap to ensure IHS' buy-in, adoption, and ownership.</p>
<p><b>Cost and Time Estimates:</b> If the cost, project interdependencies, and inherent risks of IHS' HIT modernization program are underestimated or understated, then the scope, delivery time, and quality of deliverables will be negatively impacted.</p>	<p>Conduct a comprehensive cost analysis, accounting for the full scope, schedule, and resource requirements of modernization. Verify and validate core requirements for infrastructure upgrades and data cleansing, normalization, standardization, migration, and post-migration validation.</p>
<p><b>Requirements Management:</b> If the requirements elicitation process for modernization is deficient or fails to capture, verify, and validate critical system requirements and their interdependencies, then the scope, cost, and schedule of the modernization program may be understated and the resultant quality of program outcomes severely impacted.</p>	<p>As a critical work initiative of IHS' HIT modernization program's roadmap, IHS must review and refine existing requirements elicitation practices into a formal Requirements Management process.</p>
<p><b>Service Maturity and Governance:</b> If IHS is deficient in IT service maturity or critical internal controls and governance practices, processes, and SOPs to guide and enable modernization, then the modernization program will be impeded and unnecessarily protracted due to avoidable delays and rework that will increase costs.</p>	<p>As foundational work initiatives of IHS' HIT modernization program's roadmap, IHS must enhance existing IT service delivery, internal controls, and governance practices into repeatable, verifiable processes.</p>



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## 6.2 Known Constraints and Mitigations

The following known constraints and mitigations are presented for review:

Constraints	Proposed Mitigations
Critical and unique system capabilities currently implemented in the Resource and Patient Management System (RPMS) persist to the replacement HIT solution or ecosystem	IHS must provide HIT systems that are attractive to the I/T/U programs through support for integrated, multidisciplinary care (behavioral health, dental, etc.) as well as population health and individual patient care. Requirements and resultant capabilities and functionality related to traditional medicine, AI/AN population health, etc. must persist in the replacement HIT solution.
Funding and staffing levels	Noted as a foregoing operational issue but not assessed in detail; as such, this report assumes that funding to improve infrastructure, to recruit, train, and retain local and national support staff, and to address development and implementation costs for new or updated systems will be available.
Lack of organizational readiness for change	Through an enterprise-wide organizational change management initiative, IHS shall plan and execute the required strategic and operational changes required for success of the Modernization program.
Site-specific infrastructure constraints related to limited bandwidth, poor cellular signal, degraded or inadequate telephony and wide area network (WAN) infrastructure, etc.	As a primary and critical initial step in IHS HIT Modernization program, IHS must conduct a comprehensive infrastructure analysis and subsequent infrastructure build-out to remediate critical infrastructure deficiencies. Moreover, infrastructure constraints that are too costly to mitigate will proactively inform and influence the selection, architecture, design, and topology of the new HIT solution in order to achieve cost-efficiencies and optimal system quality.
Interoperability requirements	<p>The replacement HIT solution or ecosystem must be intrinsically interoperable and must support data sharing, both within and external to the I/T/U. The following recommendations will assist in meeting interoperability goals:</p> <ul style="list-style-type: none"> <li>● Conduct a gap analysis to identify and prioritize interoperability deficiencies in IHS' HIT ecosystem</li> <li>● Define IHS' interoperability strategy and communicate it broadly to stakeholders</li> <li>● Ensure interoperability needs are surfaced through the Requirements Management (RM) and Enterprise Architecture (EA) artifacts</li> <li>● Partner with the Acquisition Planning and Procurement (AP&amp;P) office to integrate interoperability needs into acquisition planning</li> <li>● Adhere to open standards in the design and implementation of interoperable systems</li> <li>● Ensure strict security and privacy of data and information shared across interoperable systems to drive wide-scale adoption</li> <li>● Utilize efficient, cost-effective infrastructure to achieve interoperability across distributed and external systems</li> <li>● Implement non-intrusive, value-added data governance practices</li> </ul>



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Regulatory compliance	Through an improved requirements management process, value-oriented lightweight enterprise architecture (EA) practice, and outcome-driven governance, the replacement HIT solution or ecosystem will meet or exceed regulatory requirements, including the Office of the National Coordinator for Health Information Technology (ONC) and the Centers for Medicare & Medicaid (CMS) certification requirements and other regulatory constraints, such as Clinical Laboratory Improvement Amendments (CLIA).
Security, confidentiality, patient privacy	Through ongoing and augmented security practices, IHS shall identify, validate, and prioritize external and internal security vulnerabilities and threats through a security risk assessment (SRA). The results of this assessment will lead to improvements in data security, confidentiality, and privacy, thereby driving increased compliance and patient satisfaction.
Support for legacy systems/subsystems/ components	Any approach that retains legacy systems/subsystems/components must plan for ongoing operations and maintenance (O&M) or replacement of VistA-derived packages. Moreover, there are associated cost and resource implications as well as related risks.



### References

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