



Utilizing the IIS Baseline Requirements Traceability Matrix (RTM)

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Land Acknowledgement

Every community owes its existence and vitality to generations from around the world who contributed their hopes, dreams, and energy to making the history that led to this moment. Some were brought here against their will, some were drawn to leave their distant homes in hope of a better life, and some have lived on this land for more generations than can be counted. Truth and acknowledgment are critical to building mutual respect and connection across all barriers of heritage and difference.

We begin this effort to acknowledge what has been buried by honoring the truth. At the Minnesota Department of Health, we stand on the ancestral lands of the Dakota people. We want to acknowledge the Dakota, the Ojibwe, the Ho Chunk, and the other nations of people who also called this place home. We pay respects to their elders past and present. Please take a moment to consider the treaties made by the Tribal nations that entitle non-Native people to live and work on traditional Native lands. Consider the many legacies of violence, displacement, migration, and settlement that bring us together here today. Please join us in uncovering such truths at any and all public events.*

*This is the acknowledgment given in the USDAC Honor Native Land Guide – edited to reflect this space by Shannon Geshick, MTAG, Executive Director Minnesota Indian Affairs Council

Discussion Topics

- Requirements Traceability Matrix (RTM) Background/Overview
- California Experience
- Minnesota Experience

Requirements Traceability Matrix (RTM) Background/Overview



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Disclaimer

This Requirements Traceability Matrix was supported by cooperative agreement number 6-NU38OT000316, funded by the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

The IIS Functional Model provides a framework for the individual RTM requirements.



Immunization Information System (IIS) Functional Model

The IIS Functional Model presents a framework and terminology for conveying and communicating the core functions, capabilities and attributes of IIS. These systems, whether as a single integrated IIS or as a set of interoperable modules, support public health immunization programs in achieving the **CDC IIS Functional Standards*** and in providing trusted data and information to improve clinical immunization practice, increase vaccination and reduce vaccine-preventable disease.

The model also serves as a companion and index to the **IIS Baseline Requirements Traceability Matrix (RTM)**, which provides detailed requirements across IIS functions, capabilities and attributes. The RTM and other requirements tools can be found at phii.org/iis-requirements.

IIS Core Functions and Capabilities

These functions and capabilities represent core functionality of IIS. Refer to the **IIS Baseline RTM** for descriptions and functional requirements associated with each.

Administer System	Manage Organizations & Facilities	Manage Users
<ul style="list-style-type: none"> Hierarchy configuration System configuration User roles & permissions System alerts 	<ul style="list-style-type: none"> Organization/facility search Add, edit, inactivate organization/facility VFC/vaccine program enrollment Organization/facility outreach 	<ul style="list-style-type: none"> User search Add, edit, inactivate user Authentication & authorization Password management
Support Interoperability	Ensure Data Quality	Evaluate & Forecast
<ul style="list-style-type: none"> Onboarding Interfaces Data exchange 	<ul style="list-style-type: none"> Patient matching & deduplication Vaccination event matching & deduplication 	<ul style="list-style-type: none"> Clinical decision support Reminder/recall Coverage reports
Manage Patient & Immunization Records	Manage Vaccine Inventory	Provide Data Access
<ul style="list-style-type: none"> Patient search Add, edit patient demographics Patient status Patient consent Add, edit patient immunization Print/export record Mass vaccination 	<ul style="list-style-type: none"> Vaccine inventory search Add, edit vaccine inventory Vaccine ordering Review/approve order Vaccine decrementing Vaccine inventory reconciliation Vaccine transfer Vaccine wastage Vaccine expiration 	<ul style="list-style-type: none"> Standard reports Print/export reports Ad hoc queries & reports Consumer access

IIS Attributes

These attributes represent the technical characteristics of an IIS necessary to support immunization programs and stakeholders. Refer to the **IIS Baseline RTM** for descriptions and non-functional requirements associated with each.

Performance Efficiency	Usability	Reliability	Security	Maintainability	Portability
<ul style="list-style-type: none"> Time behavior Resource utilization Capacity 	<ul style="list-style-type: none"> Operability User error protection Accessibility 	<ul style="list-style-type: none"> Availability Fault tolerance Recoverability 	<ul style="list-style-type: none"> Confidentiality Non-repudiation Accountability Authenticity 	<ul style="list-style-type: none"> Analyzability 	<ul style="list-style-type: none"> Adaptability Installability

* <https://www.cdc.gov/vaccines/programs/iis/func-stds.html>

This resource was developed by the Public Health Informatics Institute in 2020, in collaboration with AIRA and CDC, with financial support from CDC under Cooperative Agreement number 6- NU38OT000316. Questions, comments and suggestions are welcomed at phii.org/iiscontact.

RTM background

Detailed set of requirements for jurisdictions to use in:

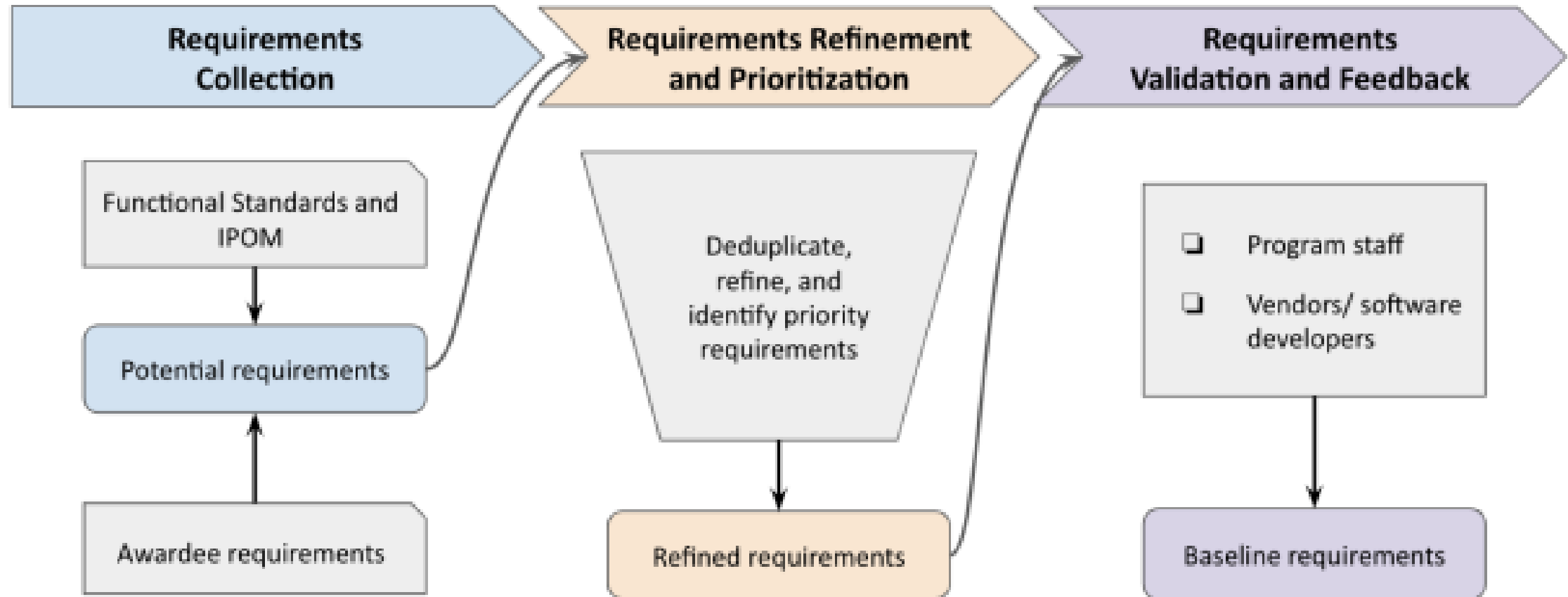
- Developing a request for proposal
- Transitioning to a new platform
- Adding specific functionality to support their program
- Contract renewals
- IIS gap assessment



Compliance measure:

Document gaps in IIS and prioritize enhancements.

RTM development process



Where do I find the RTM?

- 1 **PHII website**
- 2 **ISD Awardees SharePoint**

Updated April 7, 2022

This requirements traceability matrix (RTM) contains draft baseline functional and non-functional requirements for an immunization information system (IIS). The requirements clarify minimum expectations for what IIS technology must do and how it must operate to support IIS Functional Standards and programmatic and immunization stakeholder needs. The functional requirements describe intended behaviors of an IIS system to support business processes and tasks, by function and capability. The non-functional requirements convey technical requirements related to how a system must operate, by attribute and sub-characteristic. An embedded IIS Functional Model presents a visual depiction of the core functions, capabilities and attributes of IIS and serves as a companion to the requirements.

This RTM is intended to be used by immunization programs as a starting point for the procurement of an IIS platform, module or enhancement. The RTM should be used throughout the system development life cycle (SDLC) to ensure requirements are met in a final product or system. Immunization programs and IIS may also use the IIS Functional Model and the requirements within this RTM to help assess and identify gaps in current IIS functions, capabilities and technical quality and provide a roadmap for future development within or across jurisdictions.

Contents

Guidance: Using the RTM	Step-by-step guidance and helpful hints/notes for using the RTM as part of a procurement process.
Functional Model	Draft IIS Functional Model (FM), a visual depiction of IIS functions and capabilities and attributes.
FM Descriptions	Descriptions of the IIS Functional Model functions and capabilities and attributes; also provides an indication of total requirements by function/category.
RTM Format	Description of how the RTM is structured for presentation of the requirements.
Requirements by Function/Grouping:	
Admin System	Requirements related to the function: Administer System
Manage Orgs	Requirements related to the function: Manage Organizations and Facilities
Manage Users	Requirements related to the function: Manage Users
Interop	Requirements related to the function: Support Interoperability
Data Quality	Requirements related to the function: Ensure Data Quality
Eval Forecast	Requirements related to the function: Evaluate & Forecast
Manage Pt Iz Record	Requirements related to the function: Manage Patient & Immunization Records
Manage Vaccine Inventory	Requirements related to the function: Manage Vaccine Inventory
Data Access	Requirements related to the function: Provide Data Access
Non-functional	Technical requirements across key attributes
Glossary	List of terms used in requirements and their definitions
Crosswalk to FS	Compare the Functional Model to the IIS Functional Standards.

This RTM was developed by the Public Health Informatics Institute, in partnership with AIRA and CDC and with financial support from CDC under Cooperative Agreement number 6- NU38OT000316. Questions, comments and suggestions are welcomed at iis@phii.org.

Glossary of Terms

Terms and definitions used within requirements. Note: For definitions of general terms related to immunizations, see the [CDC Vaccines and Immunizations Glossary](#).

For definitions of general terms related to IIS, see the [AIRA MIROW Common Vocabulary](#) resources.

[Return to Cover Page](#)

Term	Definition
Admin	Refers to a jurisdictional admin and organizational admin.
Associate (verb)	Establish a relationship between entities. Synonymous with "link."
At rest	Used to refer to data in storage within the IIS.
Audit log	Also referred to as an audit trail. Used to refer to the tracking of information about system activity and changes, used for security purposes.
Authorization agreement	Formal or legal agreement between an organization submitting and/or using immunization data and the jurisdiction in which the terms for participating in the IIS are outlined per jurisdictional policy. E.g., data use agreement, user agreement.
Authorized consumer	A consumer authorized to access IIS record(s).
Authorized user	Individual authorized to access the system based on their role and affiliation with an IIS-authorized organization.
Automatically	Ability for the system to take action without manual intervention.
Capture	Ability to enter data via UI or interface for immediate usage. Does not necessarily imply storage.
Clinician	A clinician or health care professional who orders and/or administers vaccines (vaccine ordering provider, vaccine administering provider).
Cohort	A group of patients of particular interest to an organization/facility., e.g., a group of health plan members, a group of students, etc.
Containerization	"Containerization involves bundling an application together with all of its related configuration files, libraries and dependencies required for it to run in an efficient and bug-free way across different computing environments." (https://hackernoon.com/what-is-containerization-83ae53a709a6)
Delete	Process by which data are removed from the IIS system (including removal from data table(s). Synonymous with "purge."
During transmission	Used to refer to data being transmitted/actively moved from one location to another.
Edit	Global term to reflect ability to modify, update, change. For a particular field, this also includes the ability to delete field-level data that is no longer accurate.
Electronic notification	Communication/message out to a user without manual intervention.
Electronic response	The IIS returns a final resolution, or outcome, of processing the HL7 message with a conformant HL7 (Health Level Seven) message. (AIRA, https://repository.immregistries.org/files/resources/59394d94591bd/iis_sub_and_ack_assessment_report_-_2020_q1_remeasurement_12.pdf)
Enroll	Process by which an organization/facility is authorized to participate in an IIS and/or in a jurisdictional VFC program, as per jurisdictional policy.
Event log	Tracking (i.e., storing) information about system activity and changes, used for IT support and maintenance.
Facility	A sub-organizational unit for organizations with multiple locations. May also be synonymous for "organization" for organizations with one location. May be synonymous with "site" and "clinic."
Generate	Synonymous with "produce."
Immunization Information System (IIS)	Refers to the <i>collective</i> functions, capabilities, and attributes that support the information needs and goals of immunization programs and their stakeholders. May be a monolithic system or an integrated system of component modules.
Inactivate	Process by which a user or organizational account is made inoperative/inactive.



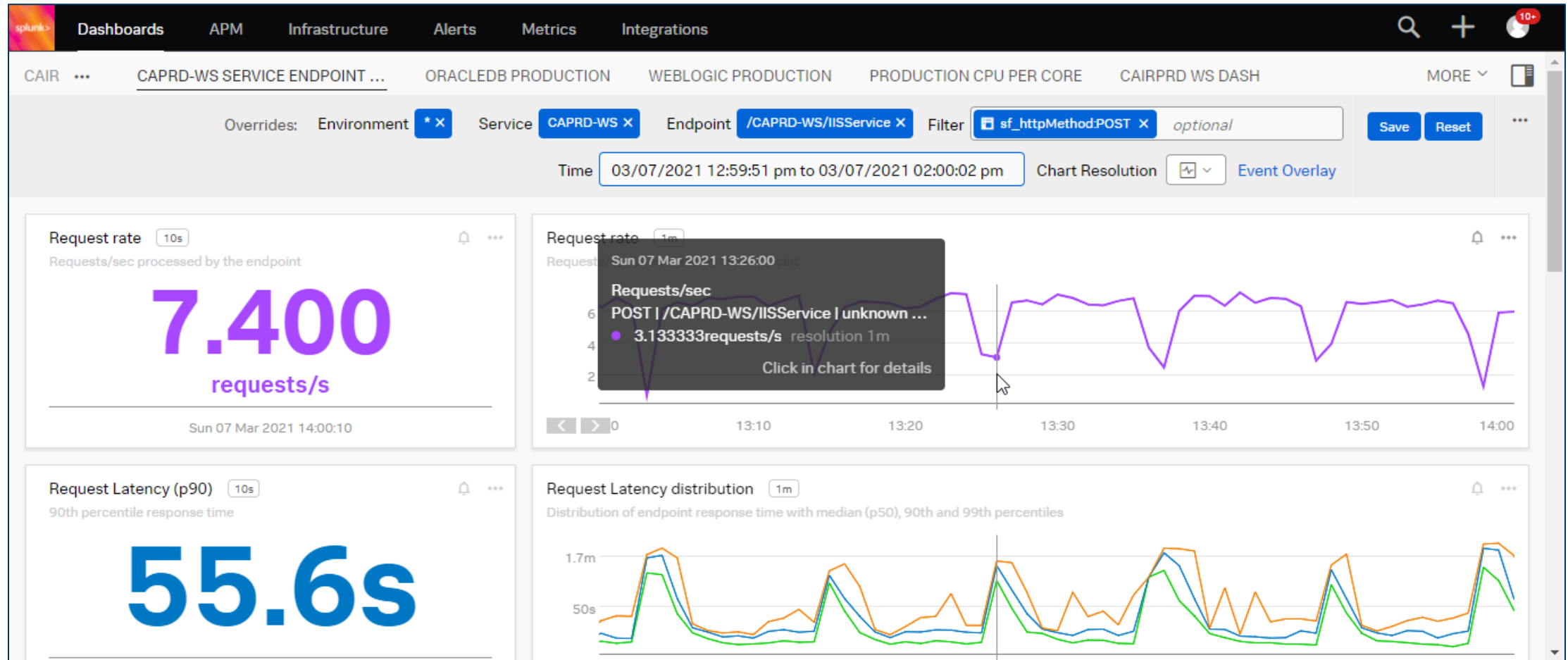
California Experience

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CAIR2 Challenges

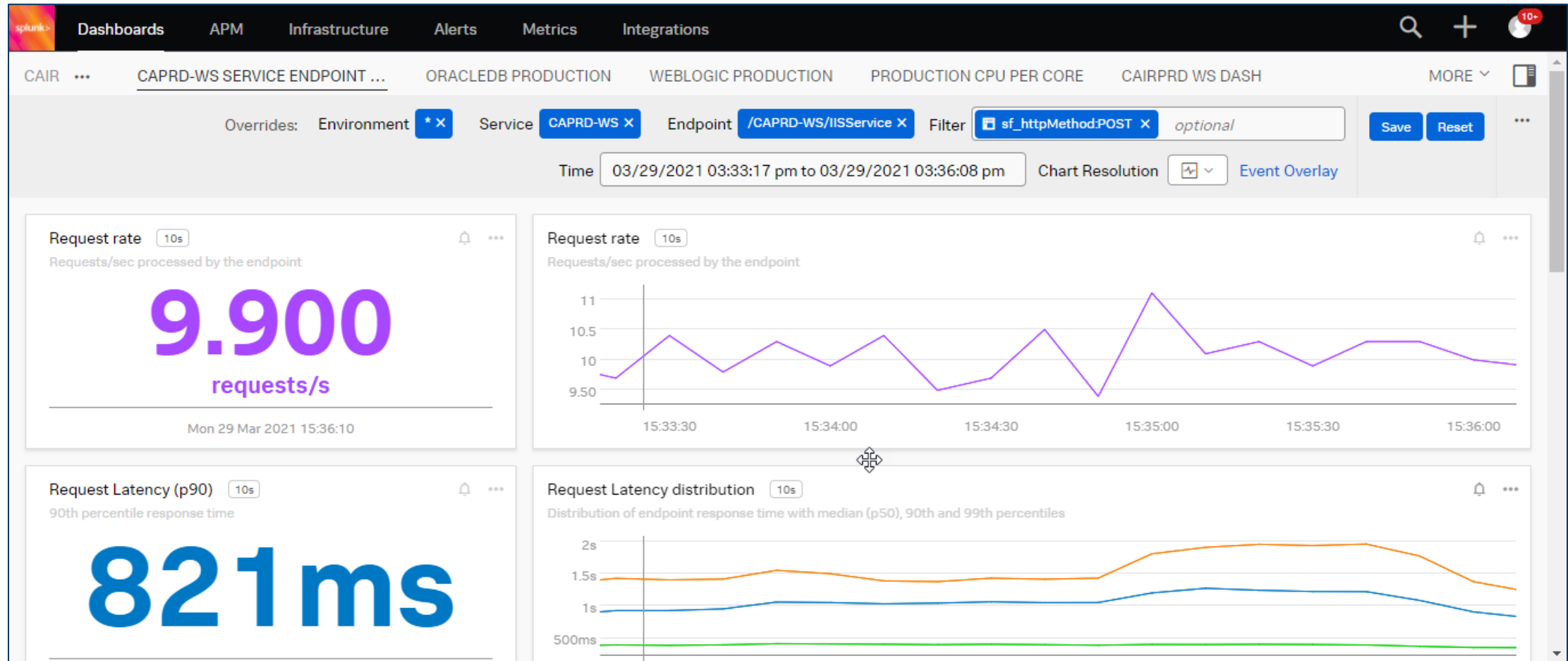
- Original State
 - 10 servers
 - Pandemic planning – added 18 servers
 - HL7 Messages /day
 - VXU 44K
 - QBP 167K
- Volumes increased
- Timing and throughput was critical
- Population-based queries
- New Providers

Initial Telemetry Assessment



- Added Telemetry
- Database Tuning
- Performance Tuning
- Managed garbage collection

Mitigated Telemetry Assessment



RTM for IIS Improvements

- Used PHII Template
- Worked with HLN and multiple internal groups to refine RTM
- Expanded RTM to include California specific changes, include requirements defined in California Statute



Minnesota Experience

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Minnesota Immunization Information Connection (MIIC)

- Created in 2002
- Lifespan IIS
- Operates under implied consent
- Continuous need to balance IIS priorities



Using RTM

Assess IIS

- Assigned requirements to subject matter experts (SMEs)
- SMEs assessed current IIS and assigned status

Data Visualization

- Clean and input results in Tableau-ready data source
- Create Tableau workbook (dashboards)

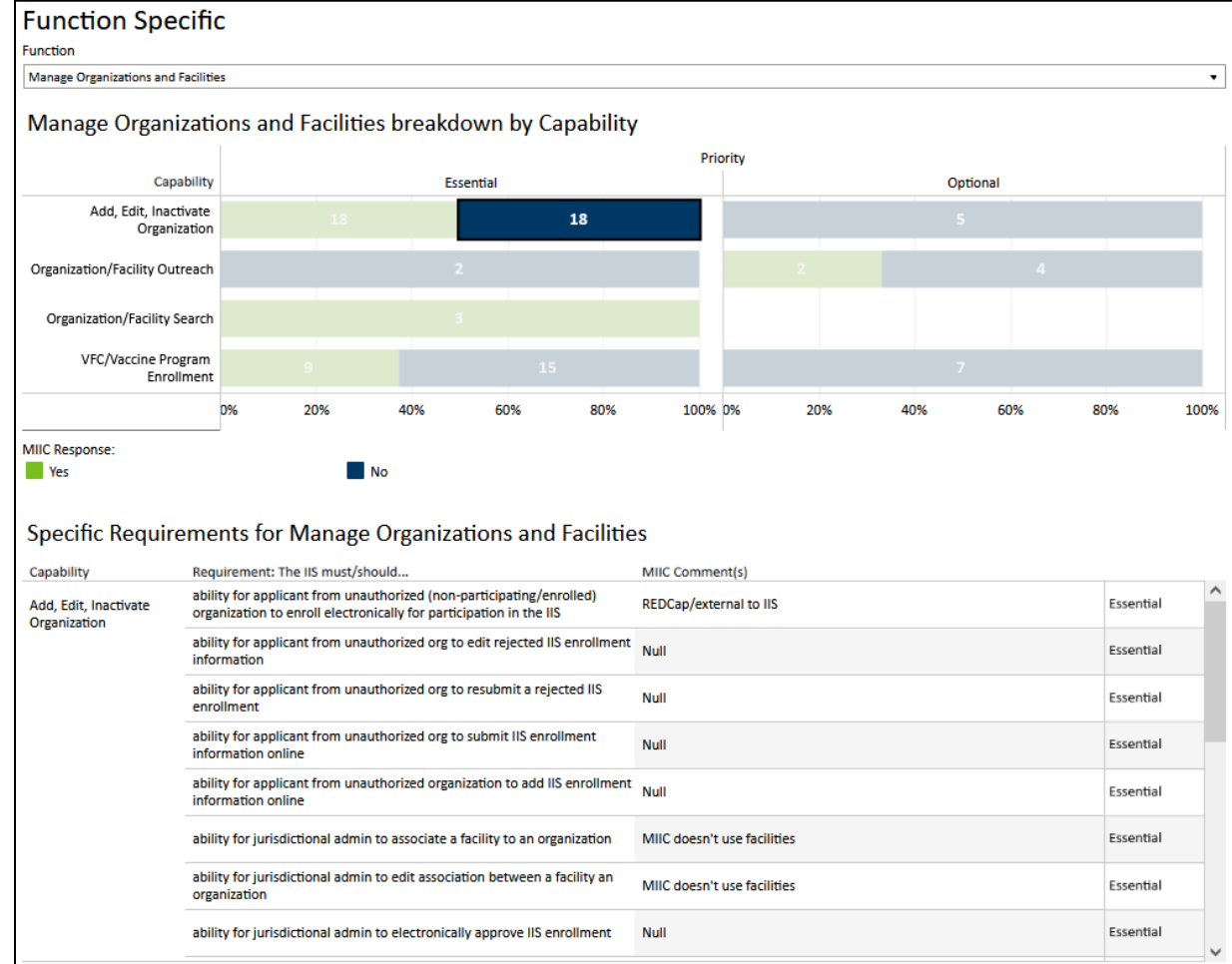
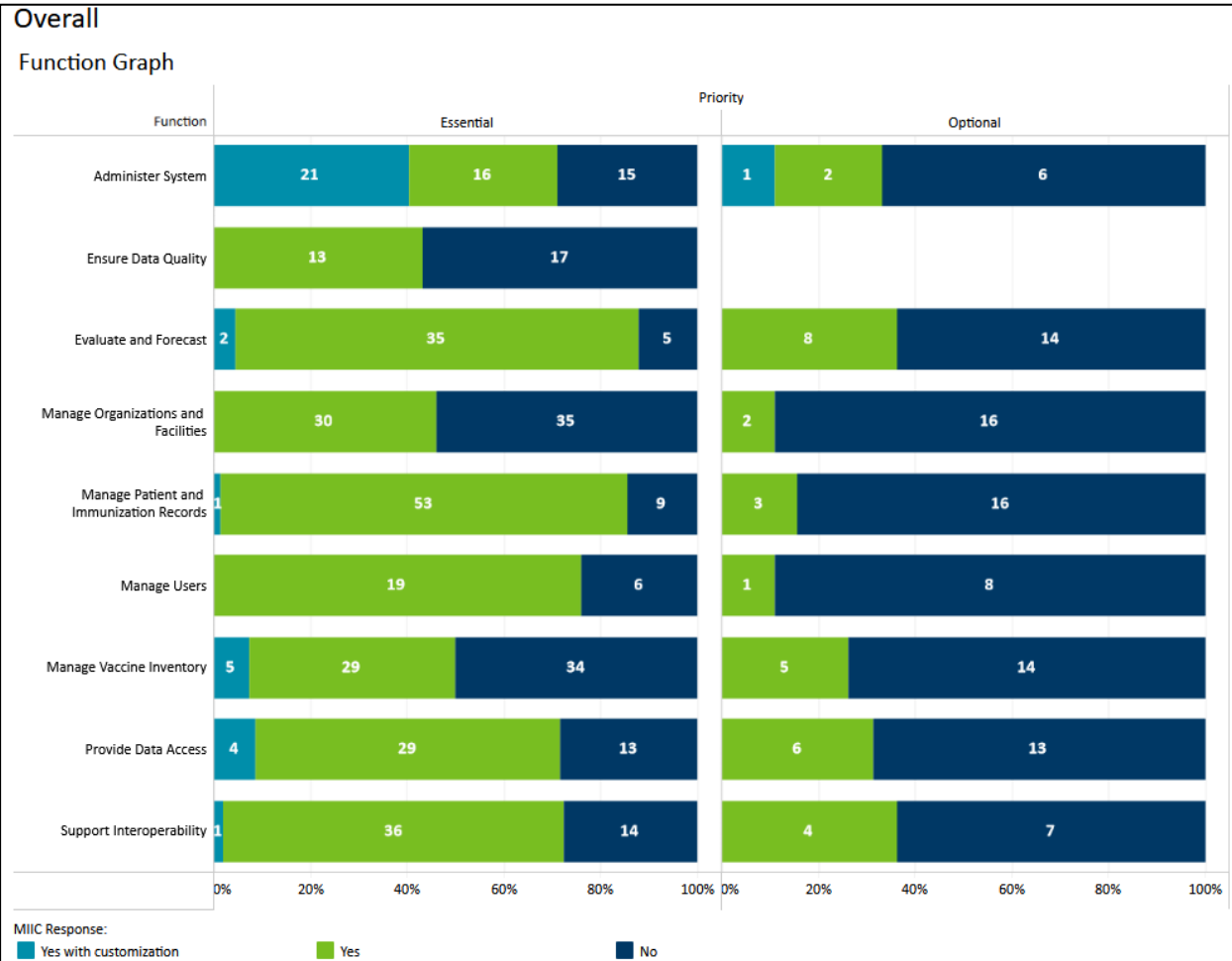
Review Results

- Review dashboards
- Identify gaps

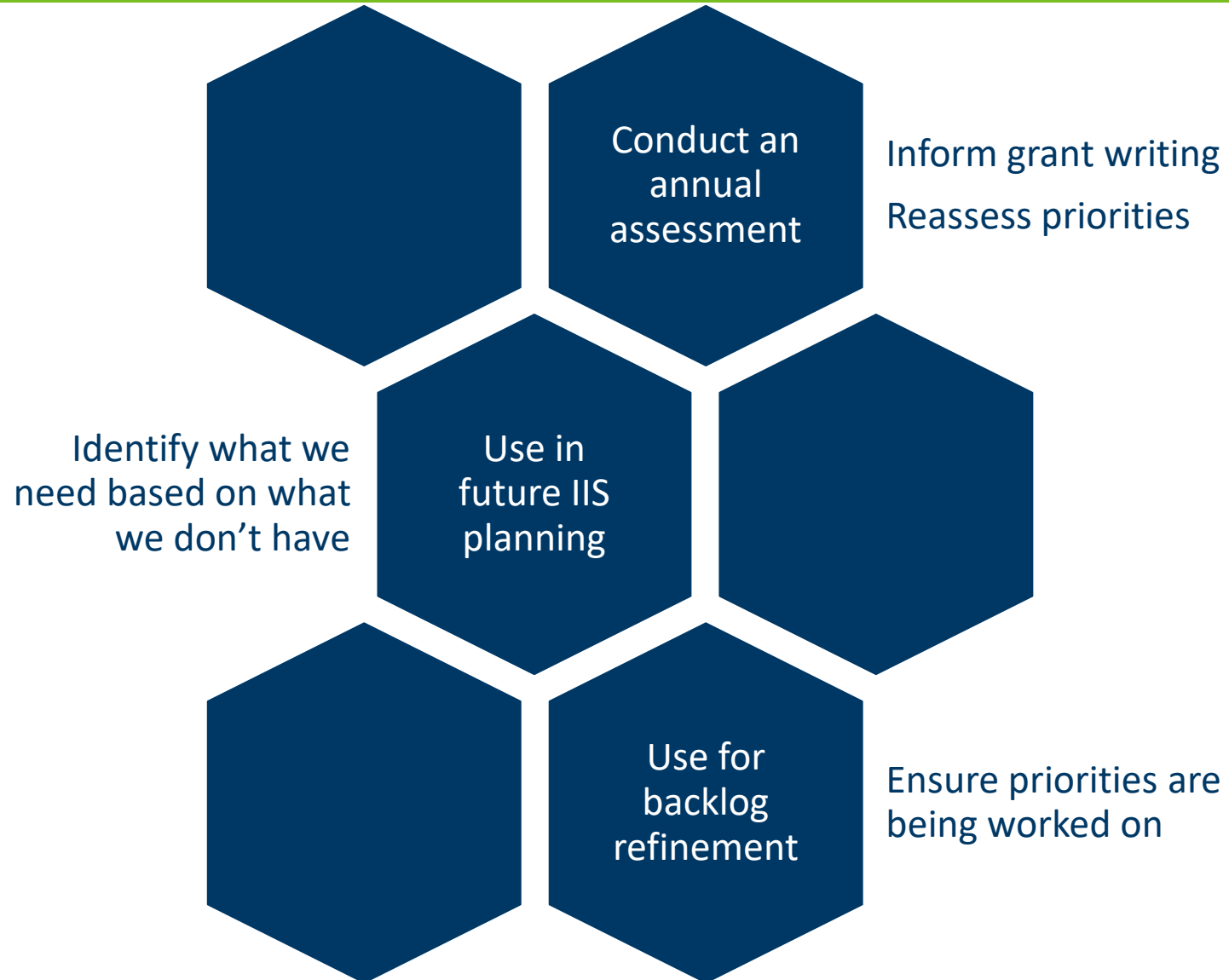
Next Steps

- 317 BY5 grant writing
- Backlog refinement

Tableau Workbook



Next Steps



Thank You!

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