



Automating Population Health

Integrating Rhapsody into Pop Health Applications

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Agenda

Population Health Overview

Technical Project Overview

Automated Ordering Project

Email Notification Project

Gap Solution Impacts

Final Thoughts

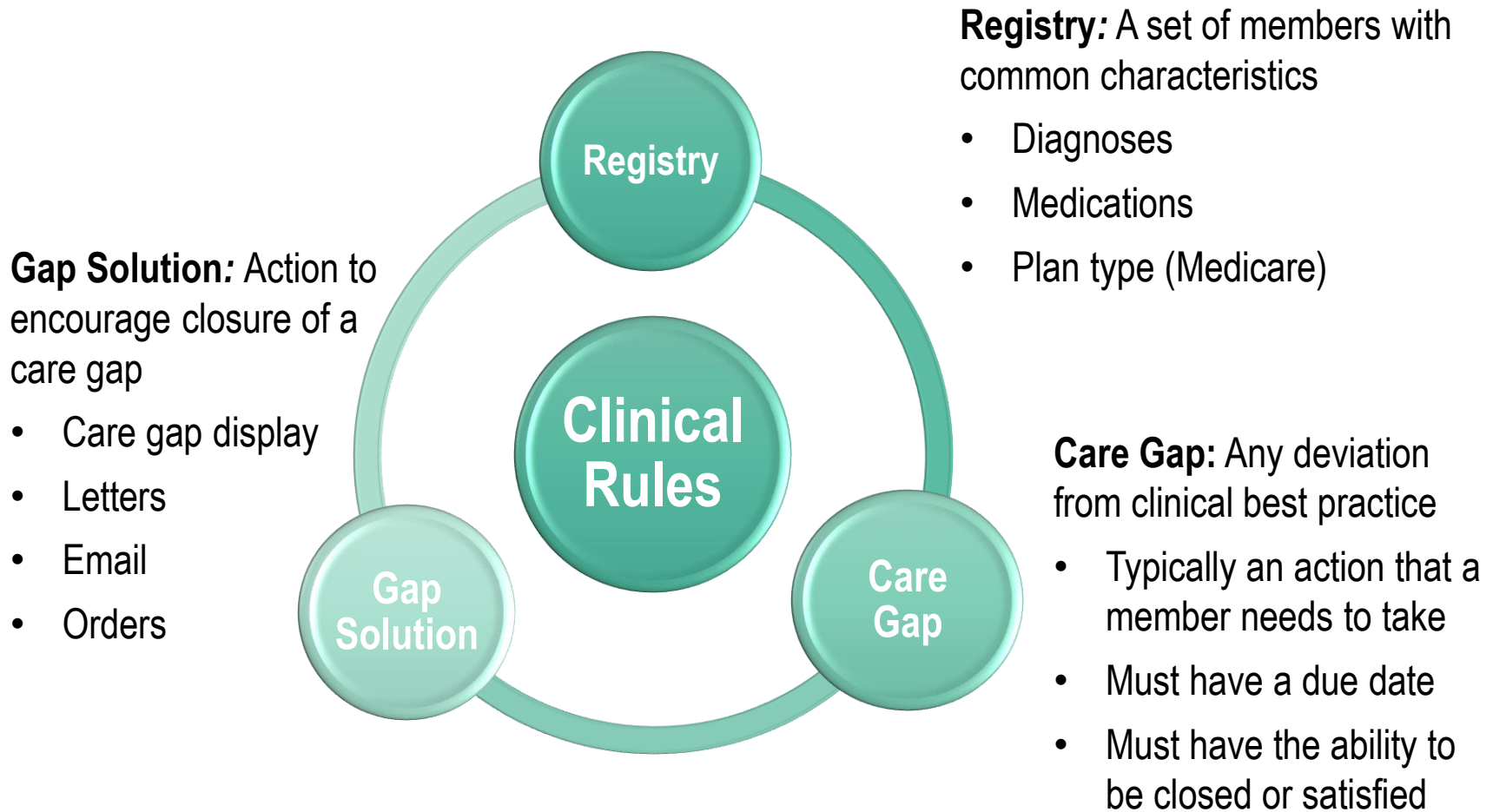
Population Health Overview

Population Health Philosophy

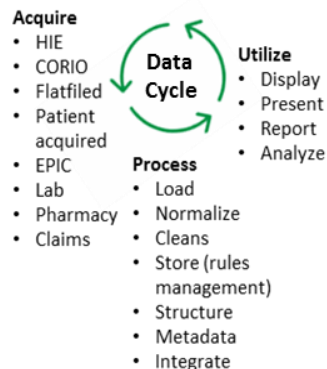
- Automate routine tasks to allow clinicians to focus on health care
- Apply evidence-based best practices to populations
- Enable members to take responsibility for their own health
- Evaluate programs by clinical outcome rather than activity
 - Total health is the goal
- Don't burden IT with maintenance and monitoring



Population Health Definitions



Clinical Decision Support Ecosystem



To applied integrated capabilities

Transition from individual capabilities



Acquisition • Discovery • Performance Measures • Automation • Care Coordination • Member View

Data Acquisition

Ad Hoc Queries

Variation Analysis

Population Analysis

Reporting

Registries

Care Gaps

Cohort Analysis

Population Management

Pre-Processed Data
(indigo, Medication Adherence, Dawn AC)

Outreach

Forms

Letters

Auto Ordering

Bulk Ordering

In reach

Ability to act on data

Consumerism

KP.org

Acquisition

Analysis

Discovery

Integration

- Clinical Decision Support requires the integration and application of capabilities to fully achieve a mature ecosystem
- Kaiser Permanente has many existing capabilities
- There are opportunities to accelerate and integrate more capabilities

Technical Project Overview

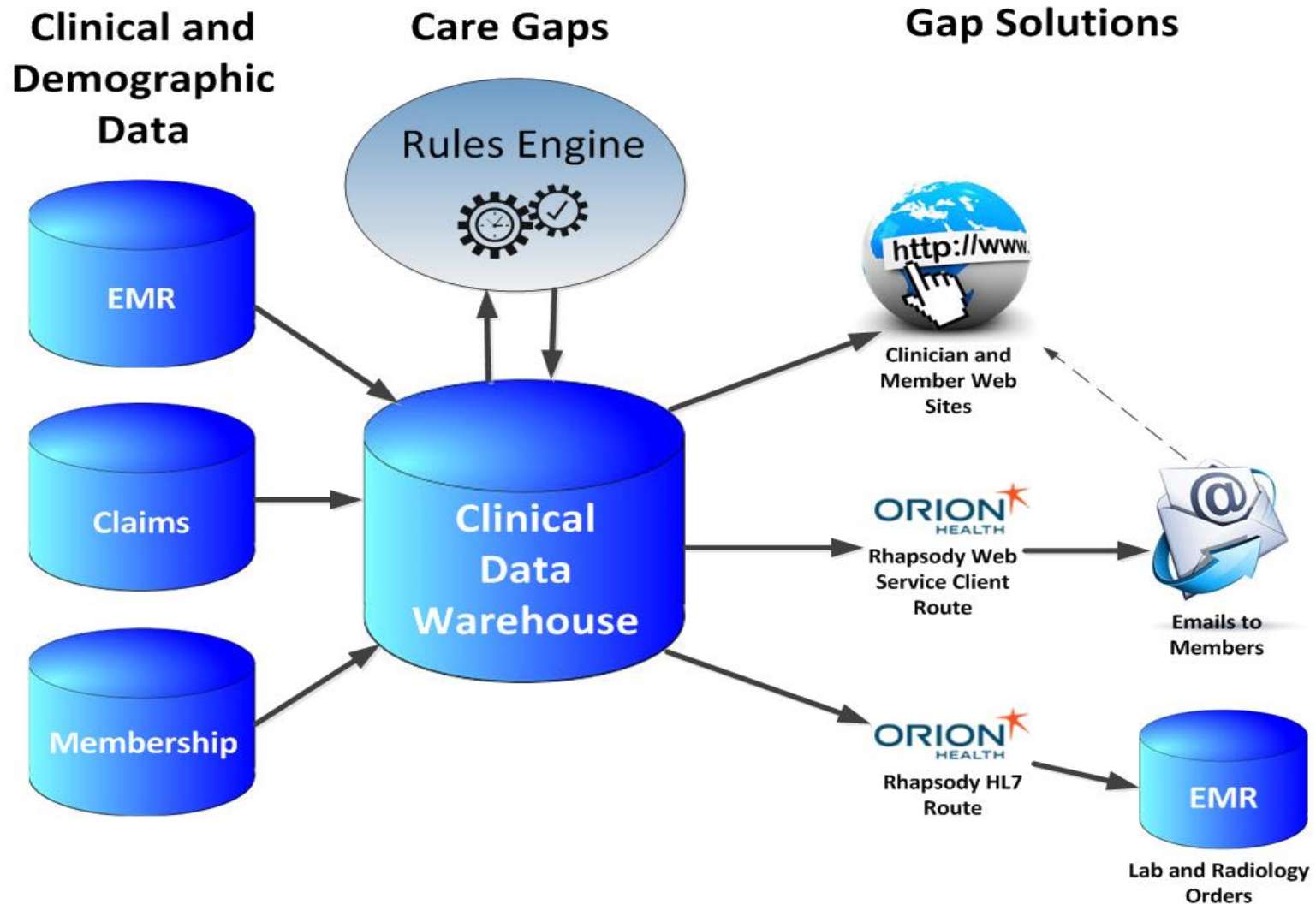
Key Technical Project Concepts

- Simple solutions are easier to maintain
- Database-centric, with limited application code
- Automate whenever possible
- Utilize stored procedures and reusable components
- Leverage existing systems and functionality
- Use the appropriate technology and tools for the job

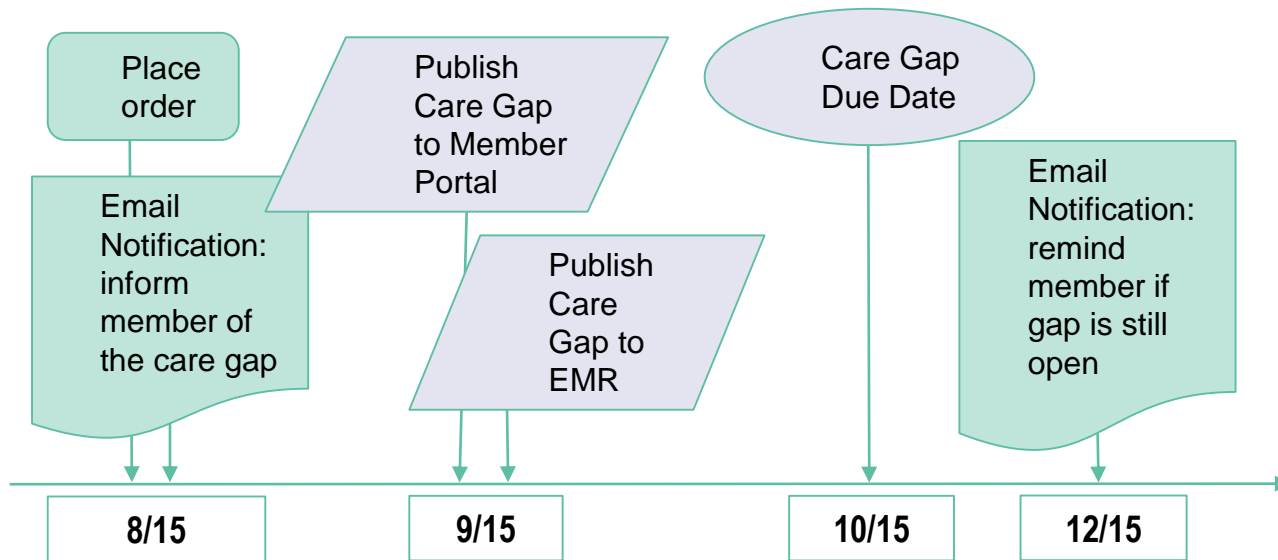
Gap Solution Projects

- **Automated Ordering** – Automatically places lab and radiology orders in EMR as soon as or prior to when they are due
- **Email Notification** – Sends emails to patients who are due for labs or procedures directing them to a website to view details on what their next steps should be

Gap Solution Data Flow



Use Case – Automate Routine Actions



■ Breakthrough

- Automating routine member communication, lab order and negative results management

■ Value

- Consistent, timely execution of Population Health Management activities
- Frees clinician time for more valuable activities

Principle: Identify manual actions that are routinely performed and devise methods of automating

Automated Ordering Project

Automated Ordering Key Features

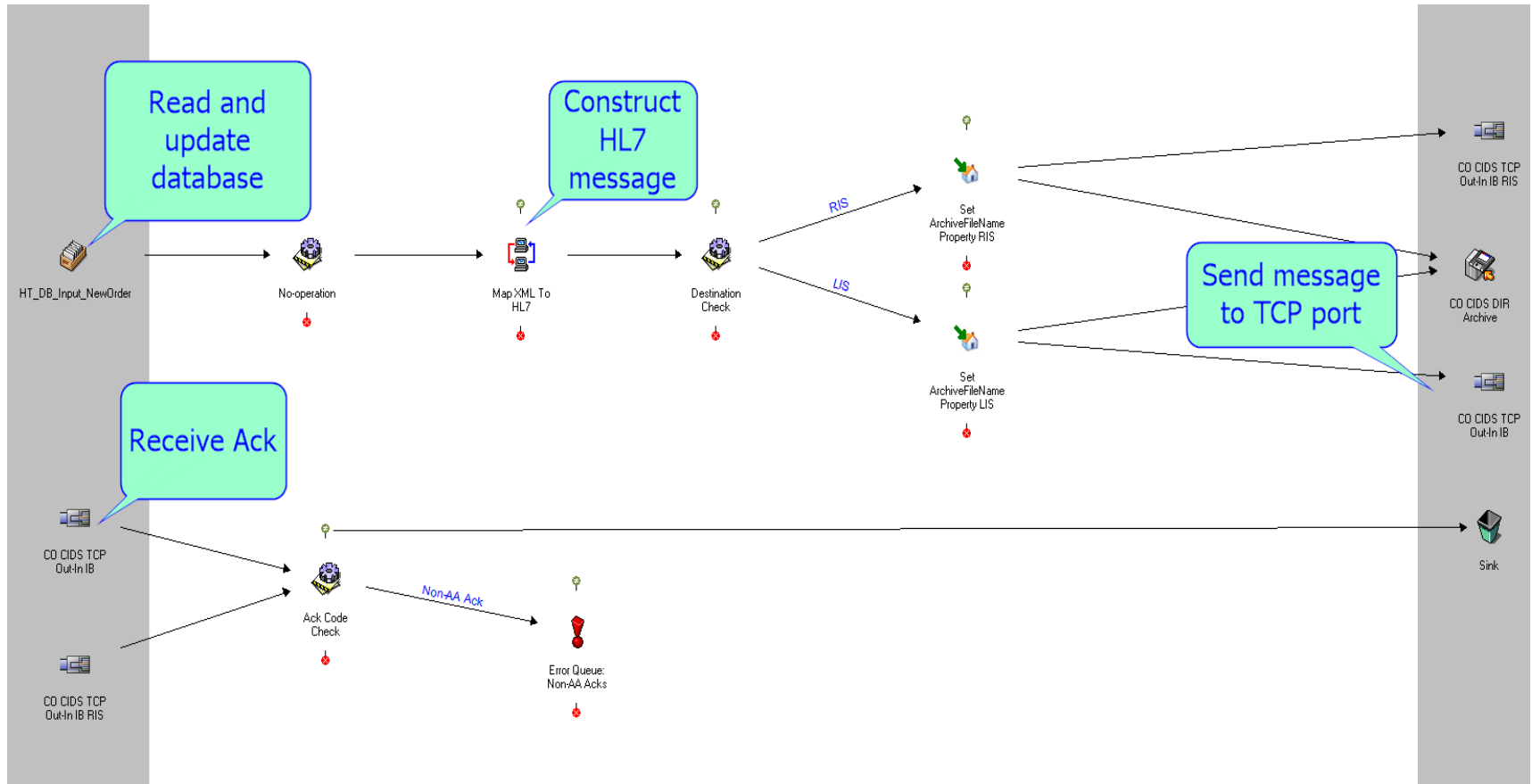
- Fully automated database/Rhapsody system
- Clinicians do not have to spend time placing routine orders
- Lab and radiology order types
- Orders are based on individualized care gaps
- Orders are available for patients as soon as they are due (or even prior)
- Real-time status changes reflected in the application

Rhapsody Key Features

- The technology is the easy part (it just works)
- No application code to write
- Reliable – runs on Linux server in the cloud
- Scheduling – New orders limited to non-business hours
- Throttling – Limit rate of orders based on type
- Rhapsody variables – Allow easy port from Test to Prod

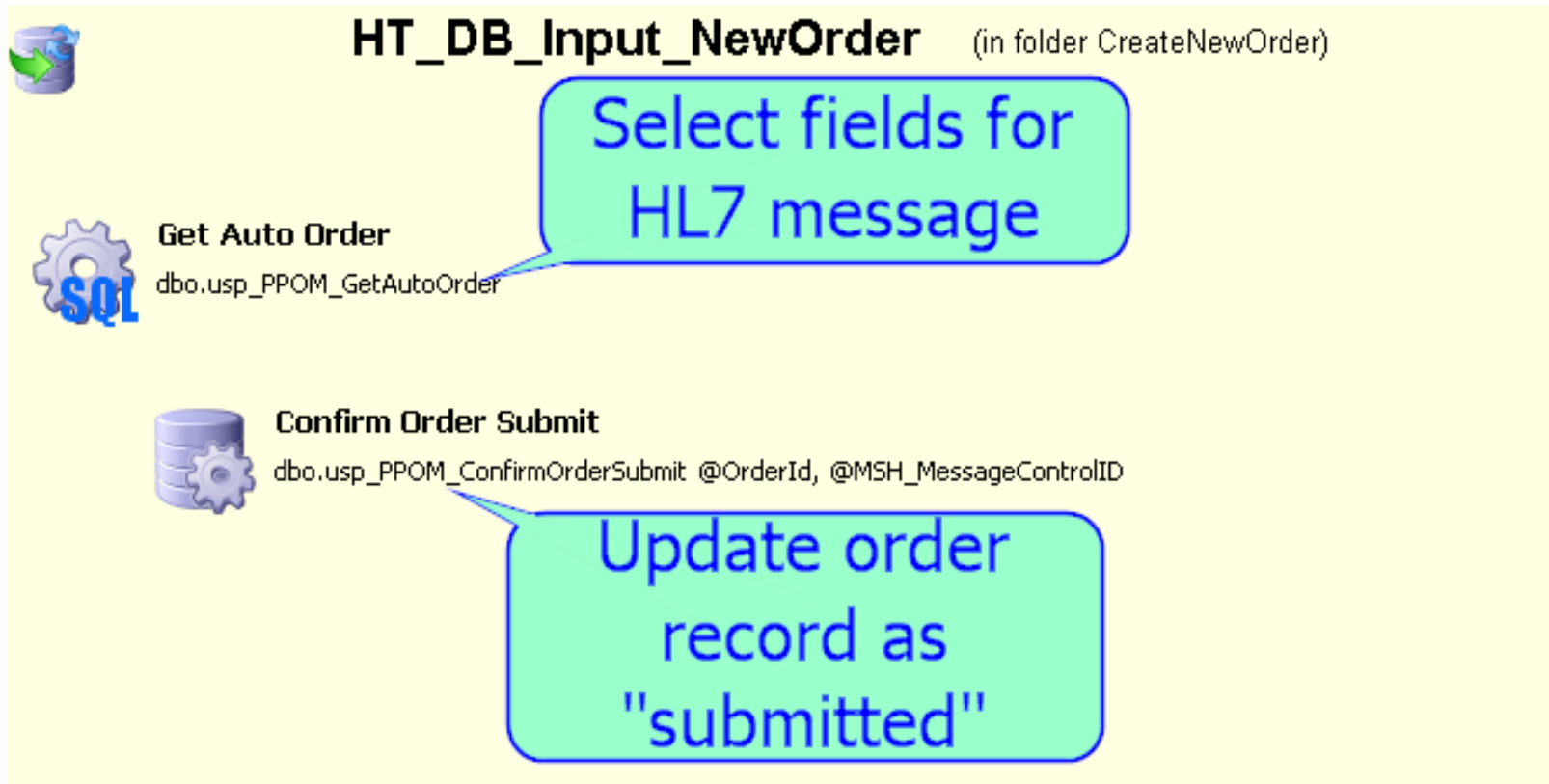
Create or Cancel Order

Rhapsody Route



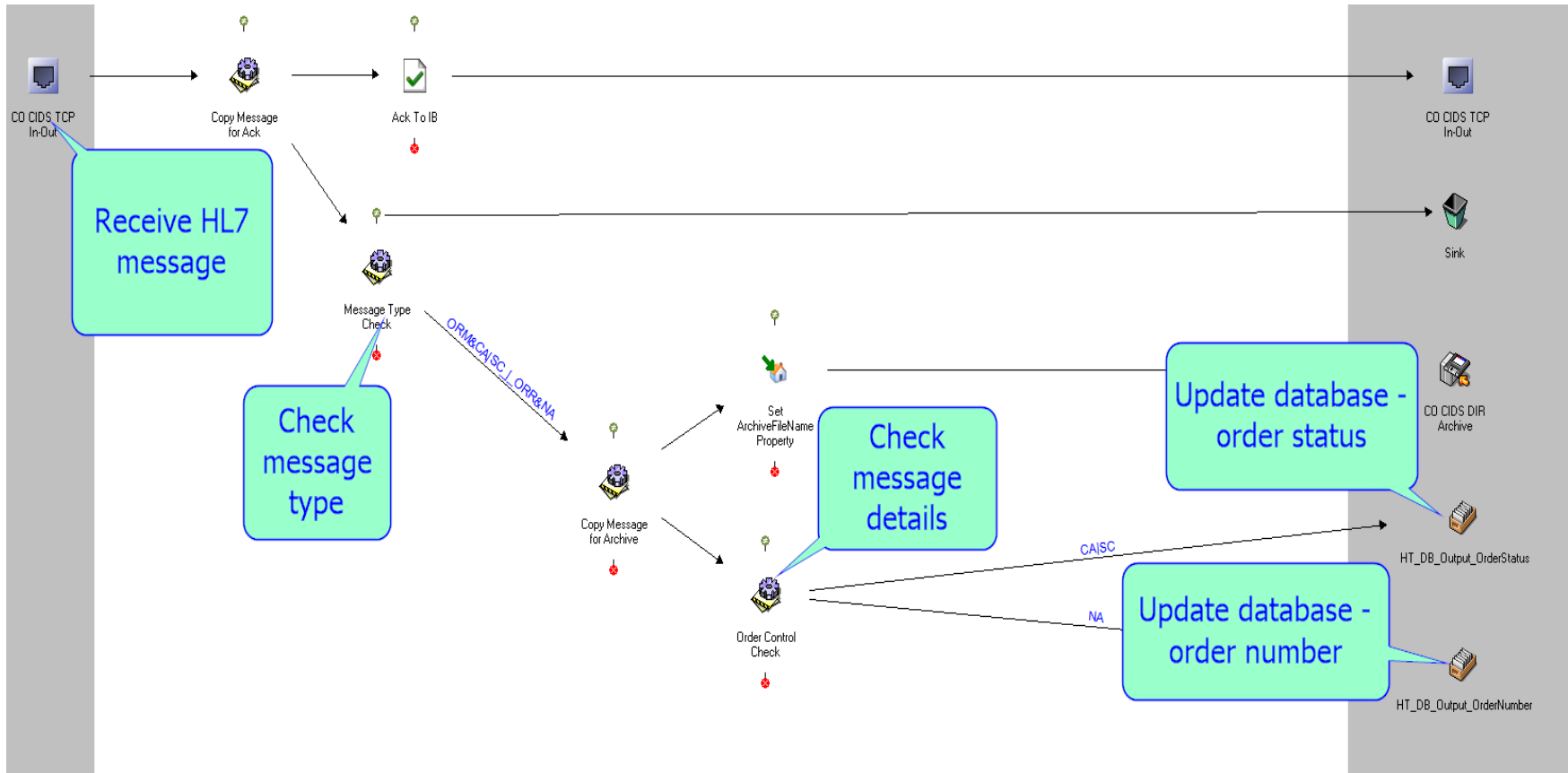
Create or Cancel Order

Rhapsody Database Config



Receive Order Update

Rhapsody Route



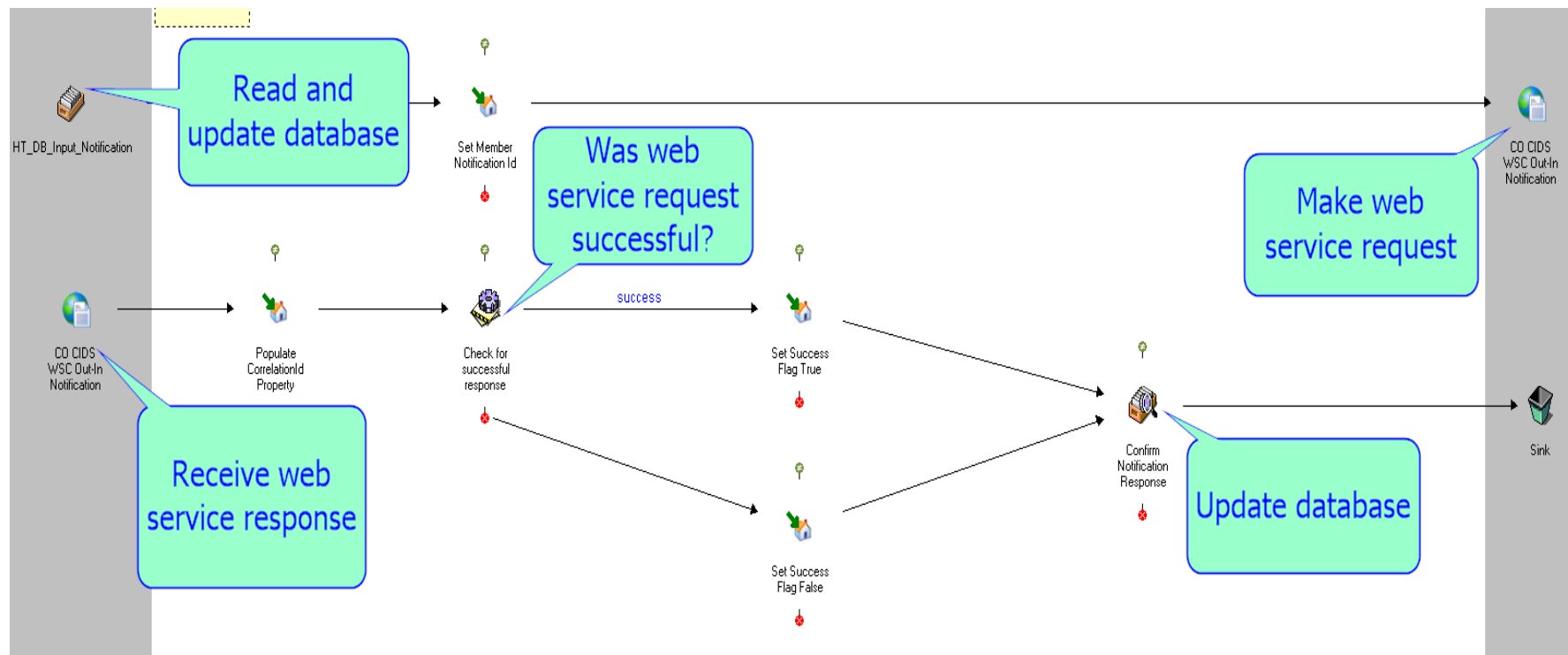
Email Notification Project

Email Notification Key Features

- Email message directs members to website for details
- Based on overdue care gaps
- Fully automated
- Leverages existing SOA functionality, maintained by national IT
- Database-driven solution, no application code

Email Notification Request

Rhapsody Route



Email Notification

Rhapsody Database Config



HT_DB_Input_Notification (in folder CO CIDS Notification)

Database Communication Point (Input)



Get Member Notification

dbo.usp_GetMemberNotification



Confirm Notification Submit

dbo.usp_ConfirmNotificationSubmit @MemberNotificationId

Email Notification Web Service Client Config

Web Service Consumer Communication Properties

General Security Operations Management

WSDL
WSDL URL: http://svn.kp.org/svn/ebis/branches/eServices_Sept2014/dpt.is.ws.platform.notification/WebContent/WEB-INF/wsdl/NotificationService.wsdl
[Reload WSDL](#)

Connection
Endpoint URL: https://service-bus-41.kp.org/service/care_deliv_sprt/com_mgmt/v1/KPORG/NotificationPlatformEventService

SOAP Binding: SOAP 1.1
☒ Send WS-Addressing Headers

Connection Timeout (ms): 60,000

HTTPS Client Authentication: Disabled

SSL Protocol: SSL

SSL Cipher Suites: Strong Cipher Suites (AES-128, AES-256, TripleDES-168, RC4-128)

Web Service Certificate:

Client Private Key:

Message Definition: CO_CIDS_GetMemberNotification.xsd

Custom SOAP Header:

```
<wsse:Security mustUnderstand="0" xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-  
  <wsse:UsernameToken>  
    <wsse:Username>KS10163</wsse:Username>  
    <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0  
  </wsse:UsernameToken>  
</wsse:Security>
```

WSDL

Service Endpoint

Custom Security Header

Email Notification

Web Service Client Config

Operation Editor

Operation Name: **sendEvents** Namespace: **http://schemas.svc.kp.org/care_deliv_spt/com_mgmt/v1/NotificationService**

Mode: **Request-Response** SOAP Action: **http://schemas.svc.kp.org/care_deliv_spt/com_mgmt/v1/NotificationService/sendEvents**

Request WS-Addressing Action: **http://schemas.svc.kp.org/care_deliv_spt/com_mgmt/v1/NotificationService/sendEvents** ☐ Enable MTOM

Request Response Fault

Configure how the outgoing SOAP request is built from the Rhapsody message.

Mode: **Construct SOAP body contents using a template and values from the Rhapsody message body and properties**

Template

```
<identifier>
  <assigningOrganizationCode>
    <code>EPIC</code>
  </assigningOrganizationCode>
  <id>|</id>
  <idType>MRN</idType>
</identifier>
</identifiers>
<isDelegate>false</isDelegate>
<metadata>
  <attribute>
    <key>ComChannel.email.subject</key>
```

Field Source

Field Destination

Content Insertion

	Source Type	Property / Field Name	...	Content Type	Target XPath
▶	Field	/message/GetMemberNotification/MRN	...	Text	/not:EventsRequest/events/recipients/person/identifiers/identifier/id
	Field	/message/GetMemberNotification/EventDate	...	Text	/not:EventsRequest/events/eventDate
*					

Gap Solution Impacts

Provider Care Gap View

Care Team				
CPT	Alert	Order Status	Due Date	Notified
83036B	<u>A1C</u>	Ordered	04/09/17	06/06/17
82565C	<u>Creatinine</u>	Ordered	08/10/17	
82274A	<u>Fecal Globin</u>	Ordered	01/06/17	02/06/17
80061O	<u>Lipid Profile non-fasting</u>	Ordered	04/08/17	
G0202A	<u>Routine Mammogram Due</u>	Ordered	01/07/17	
	<u>Obtain Blood Pressure</u>		03/29/17	06/06/17

Order
Status

A1C notifications:

Notification Method Date

KP.ORG Email Sent 06/06/17

KP.ORG Email Sent 03/02/17

Email
notifications

Member Care Gap View

Cholesterol test

Due as of 04/08/17

How:

Go to any Kaiser Permanente lab for a blood draw. You do not need to contact your personal physician or make an appointment with the lab in advance. You do not need to fast for this test.

Why:

A cholesterol test measures the fats in your blood and helps assess the health of your heart, blood vessels, and risk for heart attack or stroke. It can also show if medications are working. [Learn more about this test.](#)

[View less <](#)

A1C test

Due as of 04/09/17

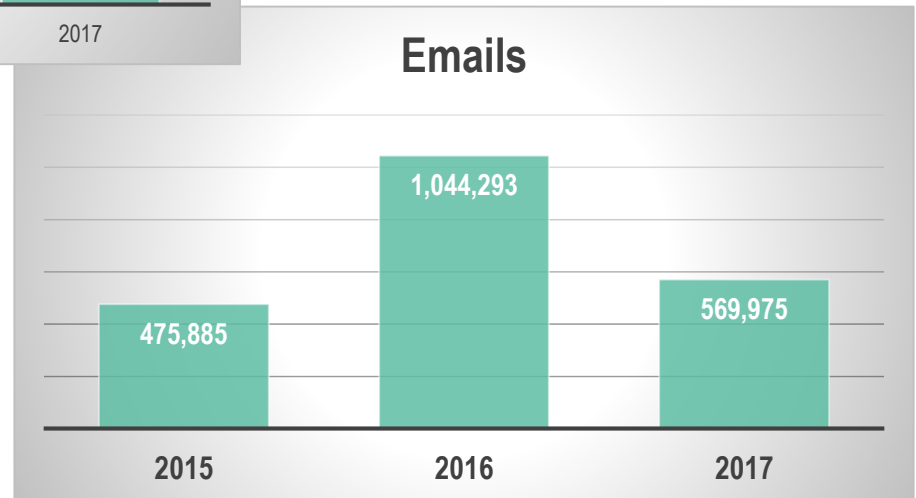
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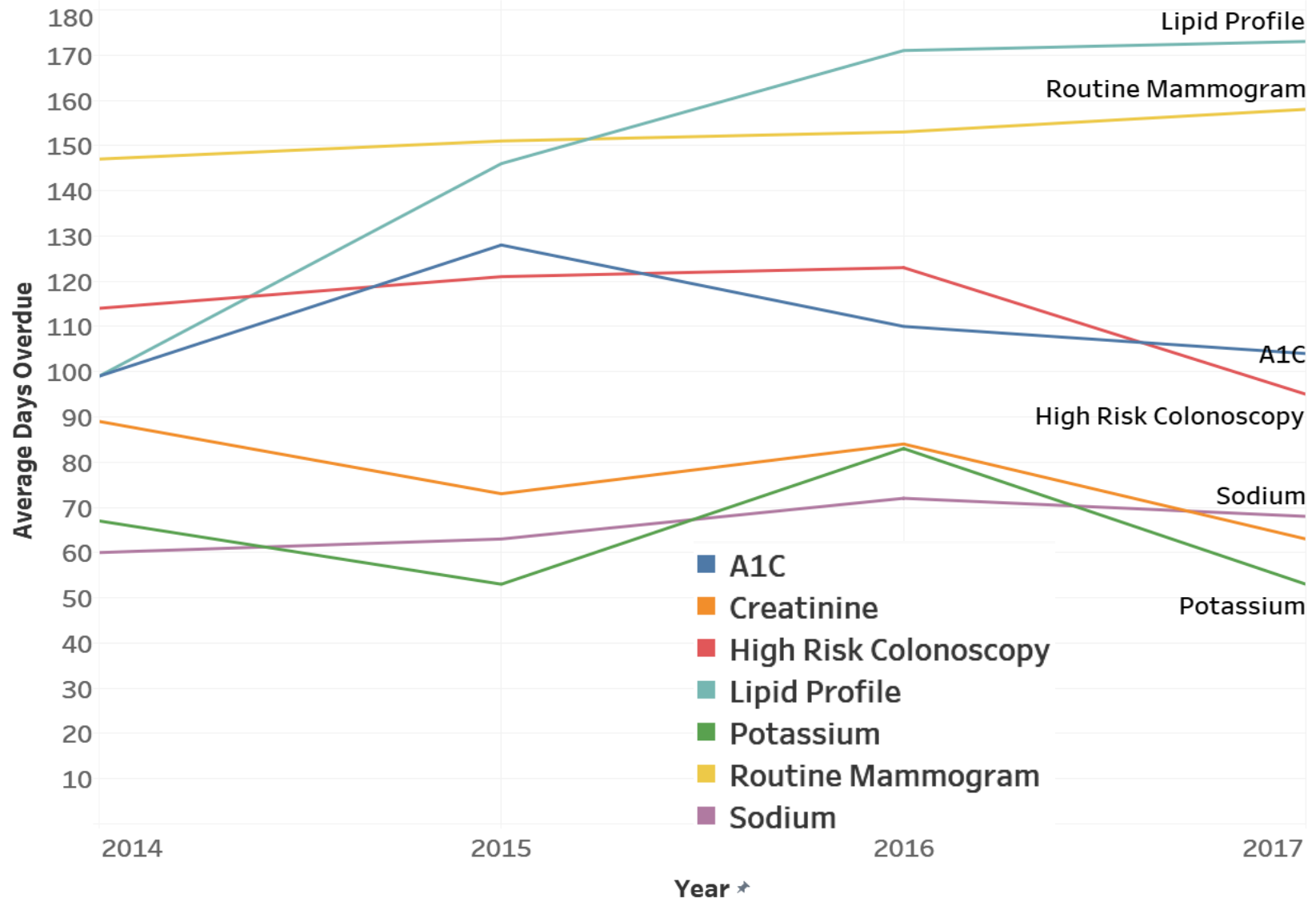
Why:

A1C is a test that tells you if your blood sugar is in the healthy range. [Learn more about this test.](#)

Message Volume



Screening Response



Final Thoughts

Key Technical Learnings

- Take Rhapsody training
 - Online or on-site
- Log actions in the database
- Utilize stored procedures
- Deploy functionality incrementally



Future Rhapsody Projects

- PCP linking synchronization
- Automated secondary care team assignment
- Specialist referral order
- Outreach encounters in EMR
- Use of FHIR and REST services





Questions?

Thank you!

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Kaiser Permanente, Population Health Informatics Services