



splunk>

Monitoring Kaiser Permanente's Open Enrollment with Splunk ITSI

A Kaiser Permanente and Splunk ITSI Professional Services Engagement

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October 2018 | Version 1.0



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Our Speakers



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Key Learning Objectives

1. How Kaiser Permanente transformed from manual to automated monitoring of Application, OS, and Infrastructure Service Health with Splunk ITSI
2. How Kaiser Permanente delivered Real-Time Value for the Open Enrollment period
3. How Kaiser Permanente maximized ROI on ITSI by making it a service offering for additional monitoring use cases for internal customers

Diving Deeply into Kaiser, Splunk ITSI, and Open Enrollment



Today's Agenda

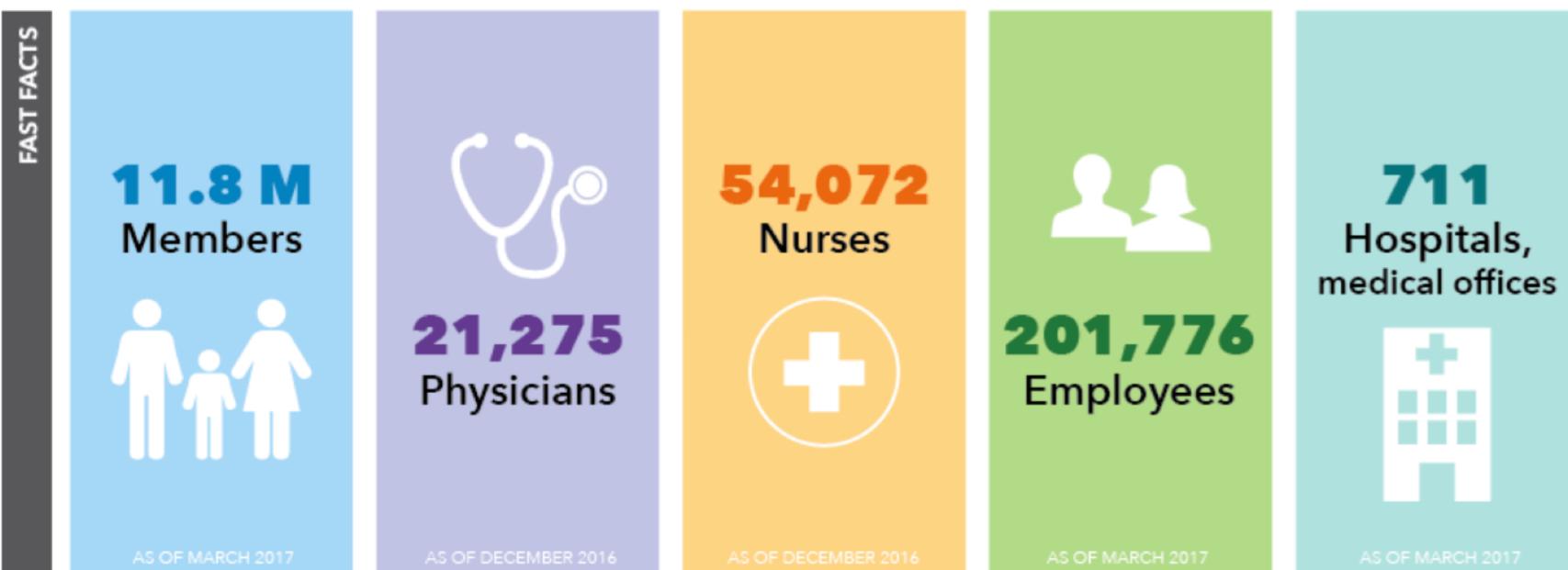
- ▶ Who is Kaiser Permanente?
- ▶ Business Challenge:
 - Open Enrollment Apps and Systems Lack Visibility and Automation
- ▶ KP + Splunk ITSI Success Framework
- ▶ Implementation
- ▶ Our Success and Business Impact
- ▶ Business Benefits
- ▶ Conclusion
- ▶ Q&A

Who is Kaiser Permanente?

Who is Kaiser Permanente?



FAST FACTS





Who is Kaiser Permanente?

► KP-IT Splunk Shared Technical Service

- Splunk is currently offered to the KP-IT Enterprise as a Shared Technical Service within the Chief Technology Office.



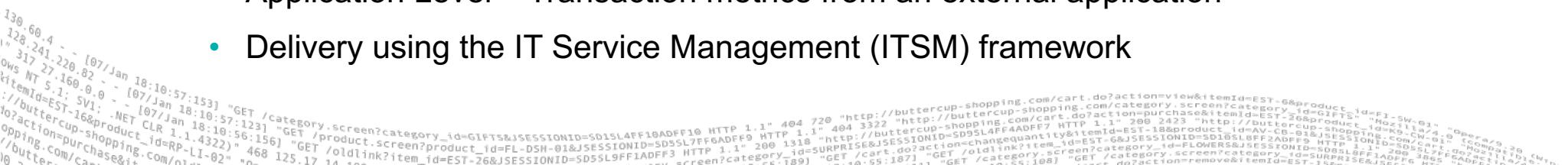
IT Operations

- **IT Operations:** Any Splunk project use case ingesting **log file datatypes (application and system level)**, which can be indexed and processed to be searchable via a Splunk Dashboard governed by time series.



Business Operations

- **Business Operations:** Any Splunk project use case ingesting **non-log file datatypes (transaction metrics, events, check-in's/check-out's, etc.)**, which can be indexed and processed to be searchable via a Splunk Dashboard governed by time series.



Business Challenge:

Open Enrollment Apps & Systems Lack Visibility & Automation





Customer Discovery (ASG Open Enrollment) – Pain Points

► Application Services Group: Open Enrollment Sharepoint Implementation

- ! Seeking an automated dashboard but automation was only available for a handful of applications
- ! Landing page was non-existent
- ! No information for automated status changes in current dashboard interface (Sharepoint)
- ! ASG relied on manual work from 30 team members, to spend 5 mins, 3 times per day, from October 1 – January 31 to make updates to the Sharepoint Dashboard
 - ! (Convert to total # of hours and billable hours) – 30 members*5mins/day*3times/day*120days = **~900 hours** *\$50/hour = **\$45,000**
- ! Sharepoint site status was manually updated with date/timestamp
- ! **No Automation!!**



Customer Discovery (ASG Open Enrollment) – Address & Solve

► **Application Services Group:** **Open Enrollment Sharepoint Implementation**

- ! Objective: All Status KPIs would automatically changes
 - ! ASG team had to have a resource available to update their application KPIs multiple times a day
 - ! Production Support team had to manually update the KPIs which was a goal to automate

Customer Discovery (ASG Open Enrollment)



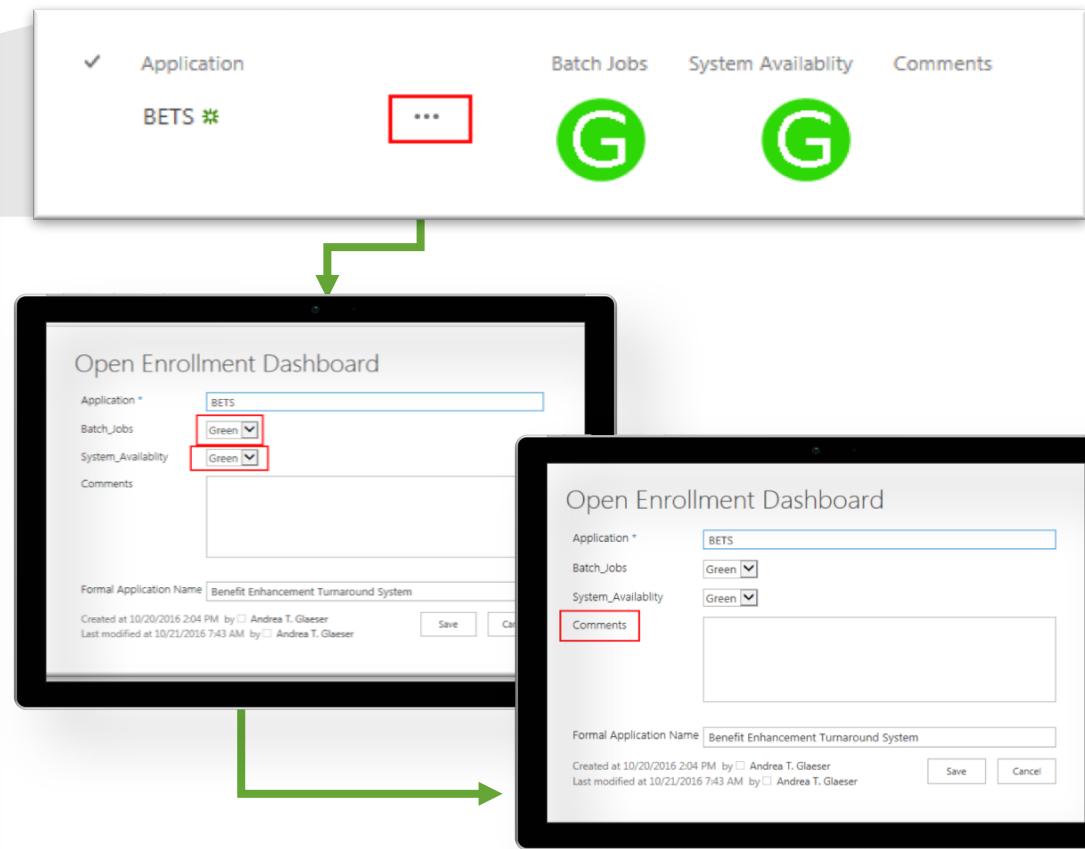
Open Enrollment Dashboard

+ new item or edit this list

All Items ... Find an item

Application	Batch Jobs	System Availability	Comments	Modified By	Modified	Formal Application Name
BETS				Gina Watkins	October 24, 2017	Benefit Enhancement Turnaround System
CARS				Gina Watkins	October 24, 2017	Common Archive and Retrieval System
CM				Srihari Perumpilavil	January 30, 2017	Common Member
CM Web Services	...			Srihari Perumpilavil	January 30, 2017	Common Member
	...		n/a	Srihari Perumpilavil	January 30, 2017	Customer Service
	...			Priya X. Mani	February 02, 2017	
	...			Srihari Perumpilavil	January 30, 2017	Foundation System

+7 clicks
for every app or service update every time



KP + Splunk ITSI Success Framework

Story

► Kaiser / Splunk ITSI PS Engagement

- In 2017, after attending several workshops over the span of two years after bringing Splunk core in for the purposes of Audit Logging and Error Handling, and later expanding the product internally as a Shared Technical Service for the enterprise, our organization decided to launch a pilot with:



Splunk IT Service
Intelligence™



Evaluation of ITSI (Why ITSI?)

- **High-value services** can be decomposed and modeled in ITSI, using machine data from the relevant systems
 - **Services** and **KPIs** can be created in minutes, with sophisticated thresholding techniques to distinguish “normal” from “not normal”
 - **Glass Tables** allow service health and KPI metrics to be displayed in a way that makes sense to specific groups, such as Executive Leadership, Business Service Owners, the NOC, DevOps & Others
 - **Deep Dives** allow KPIs to be compared side-by-side across any time range, accelerating root cause analysis and significantly reducing MTTR
 - **Multi-KPI Alerts** and **Notable Events** reduce alert noise, producing actionable events and a means to manage them
 - ... and it's fun to build!



Preparing for ITSI and a Success Framework

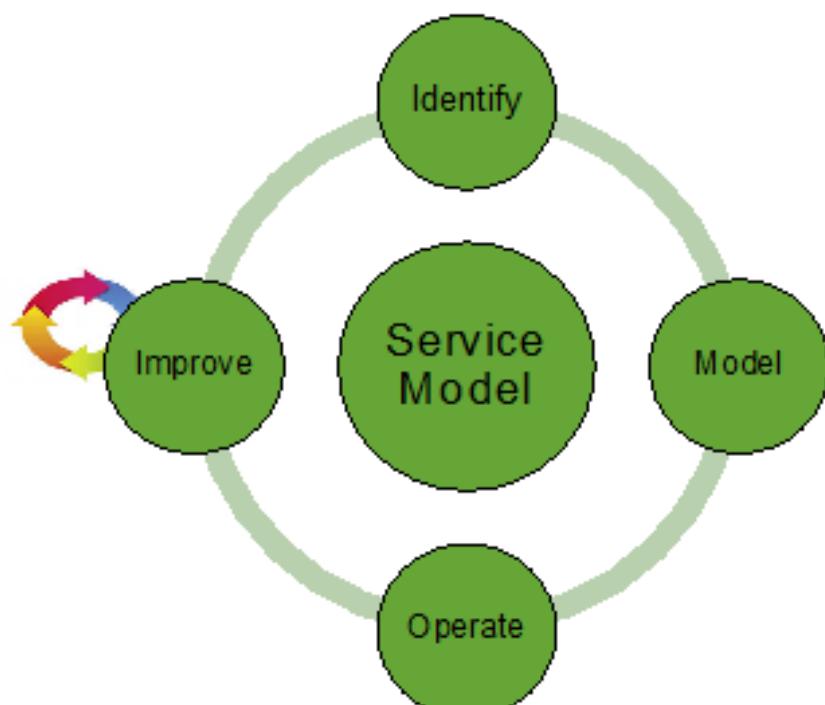
- ▶ **Review and Audit Existing Splunk Configurations on up to 2 Splunk Instances**
 - ▶ **Service Identification Workshop**
 - ▶ **Service Decomposition Workshop**
 - ▶ **ITSI Services Data Review**
 - ▶ **Glass Table Blueprint Session**

Additional Considerations for Framework Planning

- 
- ▶ Overview – WBS
 - ▶ Technical Pre-Reqs (Team Members)
 - ▶ Pre-Work
 - ▶ Strategy, Policy, Governance
 - ▶ Roles and Responsibilities
 - ▶ Service MetaModel and Planning
 - ▶ Service Import
 - ▶ Entity Planning
 - ▶ Entity Import
 - ▶ Integration Req. and Planning
 - ▶ Naming Standards
 - ▶ Service ID and Decomp
 - ▶ Version Control
 - ▶ WBS-Session Agendas
 - ▶ IT Ops Metrics

Our Kaiser / Splunk ITSI Success Framework

- ▶ **ITSI Program Policy, Strategy, and Governance**
- ▶ **ITSI Program Process and Planning**
- ▶ **Service Model Lifecycle (Repeat)**
 - Identify (*Service Model Identification*)
 - Model (*Service Model Definition*)
 - Operate (*Operationalize the Service Model*)
 - Improve (*Continuous Improvements to Service Model and Operations*)



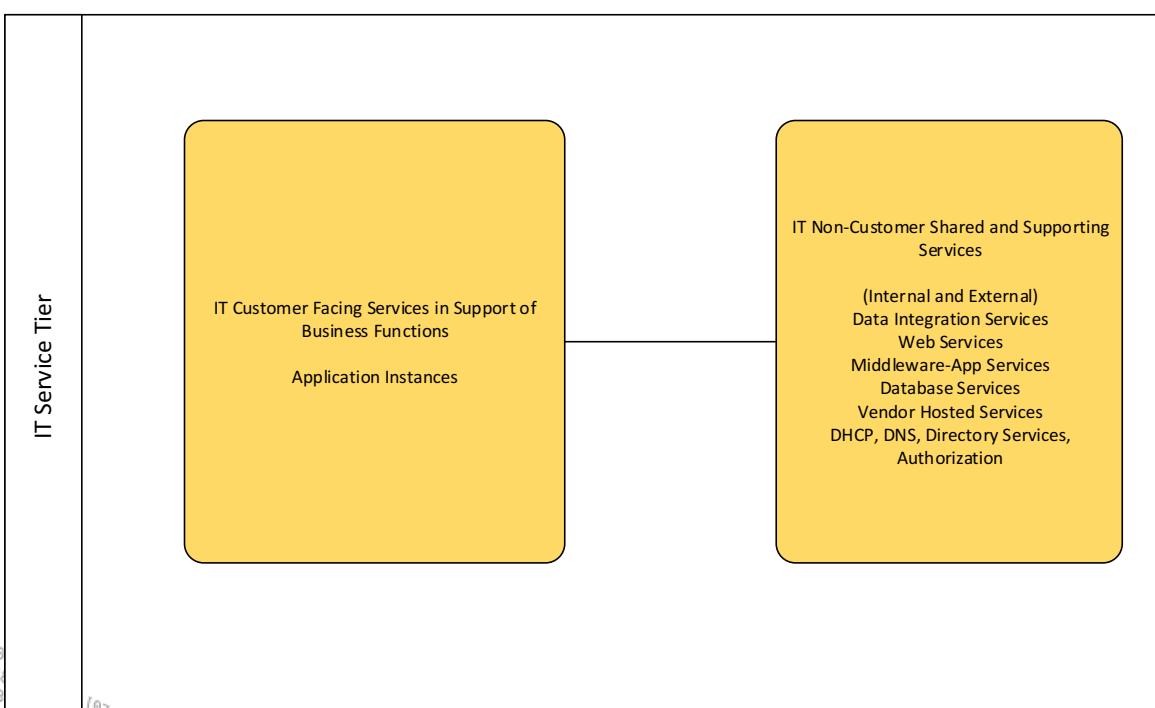
Implementation



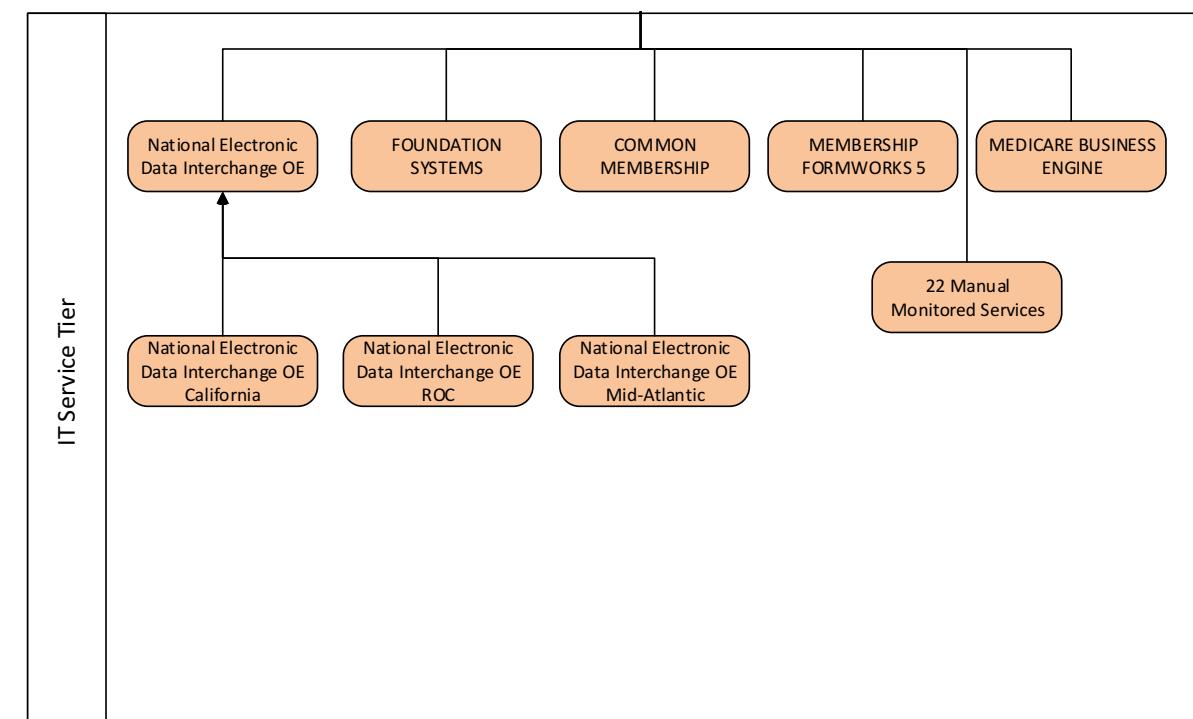
Service Identification and Decomposition



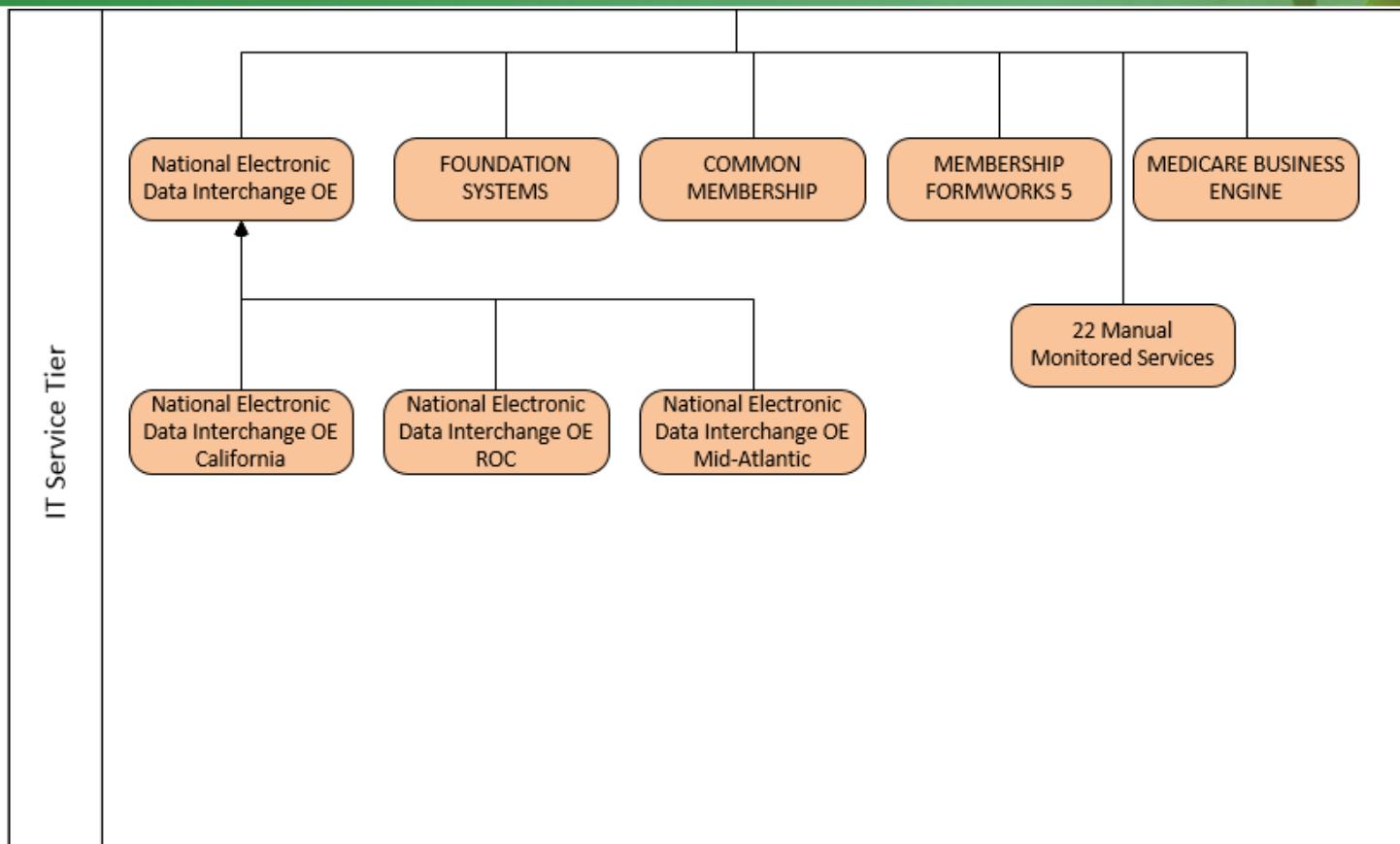
Splunk ITSI Framework



Kaiser Permanente



Service Identification and Decomposition



Installing, Configuring, & Deploying Splunk ITSI



▶ Search Heads

- ITSI Application on 1 stand-alone Search Head
 - The ITSI solution was setup on a 2nd search head prior to the PS Engagement
 - I later removed ITSI from the original search head

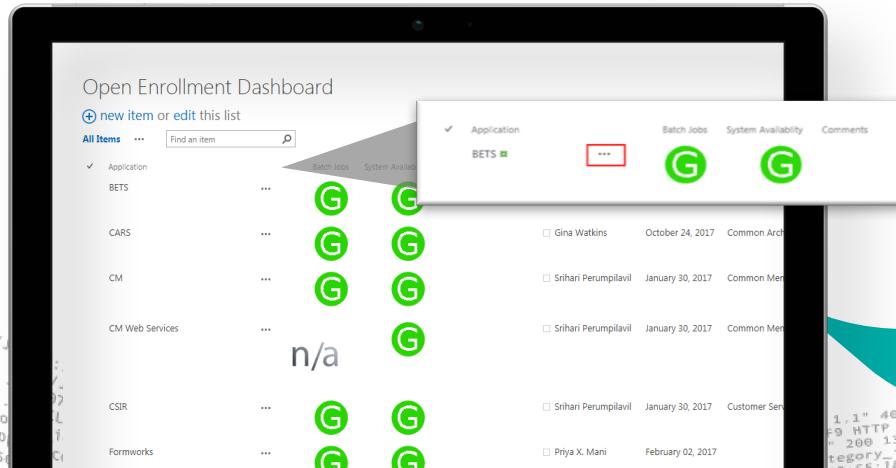
► Services, KPIs, Notable Events, & Glass Tables

- Reviewed and performed integrity checks on all Glass Tables
 - Defined a series of base KPI searches for monitoring Splunk as a Service
 - Defined several services around Splunk components that pull from the new base KPI searches defined. Additional ad-hoc KPI's were also defined within these services
 - Created a dashboard to represent the non-normal state services
 - Thresholding was adjusted in order to keep glass tables from turning red while tuning thresholds. They don't want executives getting the idea that there are trouble services prior threshold analysis
 - Extensive discussions around Entities and how entities relate to the service

Considerations for Single-View & Glass Tables

► Glass Table Design Considerations

- Who is your main audience?
Executives, Dept Heads, Leads, Support?
- How will the information be used?
Operationally, Strategically/Executive, Analytical?
- Who else will have access?
Other teams, business units, customers?



Open Enrollment Dashboard

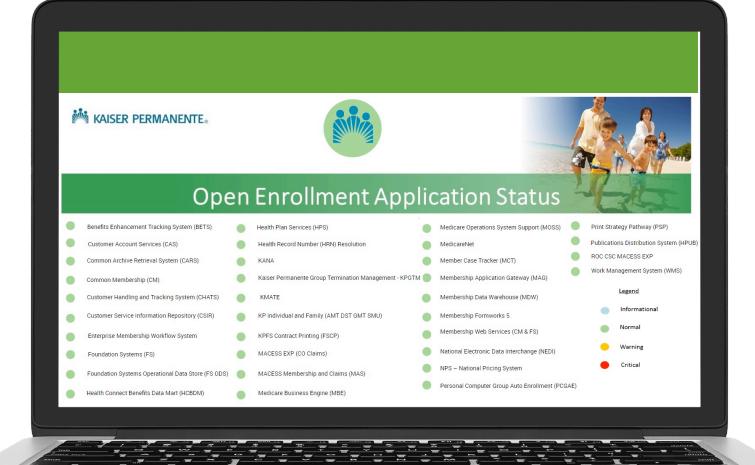
+ new item or edit this list

All Items Find an item

	Application	Batch Jobs	System Availability	Comments
BETS		G	G	
CARS		G	G	
CM		G	G	
CM Web Services			G	
n/a			G	
CSIR		G	G	
Formworks		G	G	



**Splunk IT Service
Intelligence™**



Open Enrollment Application Status

KAISER PERMANENTE

System	Status
Benefits Enhancement Tracking System (BETS)	Green (Informational)
Customer Access Services (CAS)	Green (Informational)
Common Archive Retrieval System (CARS)	Green (Informational)
Common Membership (CM)	Green (Informational)
Customer Handling and Tracking System (CHATS)	Green (Informational)
Customer Service Information Repository (CSIR)	Green (Informational)
Enterprise Membership Workflow System	Green (Informational)
Foundation Systems (FS)	Green (Informational)
Foundation Systems Operational Data Store (FS ODS)	Green (Informational)
Health Connect Benefits Data Mart (HCBDM)	Green (Informational)
Health Plan Services (HPS)	Green (Informational)
Health Record Number (HRN) Resolution	Green (Informational)
KANA	Green (Informational)
Kaiser Permanente Group Termination Management (KPGTM)	Green (Informational)
KXATE	Green (Informational)
KP Individual and Family (IAT DIST GMT SHU)	Green (Informational)
KPFS Contact Printing (FSCP)	Green (Informational)
KMFIS	Green (Informational)
MACESS BIP (IO Claims)	Green (Informational)
MACESS Membership and Claims (MACS)	Green (Informational)
Medicare Data Warehouse (MDW)	Green (Informational)
Membership Formcards 5	Green (Informational)
Membership Web Services (CM & FS)	Green (Informational)
National Electronic Data Interchange (NEDI)	Green (Informational)
NPS - National Pricing System	Green (Informational)
Personal Computer Group Auto Enrollment (PCGAE)	Green (Informational)
Print Strategy Pathway (PSP)	Green (Informational)
Publications Distribution System (PUDS)	Green (Informational)
RSC CSC MACES EXP	Green (Informational)
Work Management System (WMS)	Green (Informational)

Legend

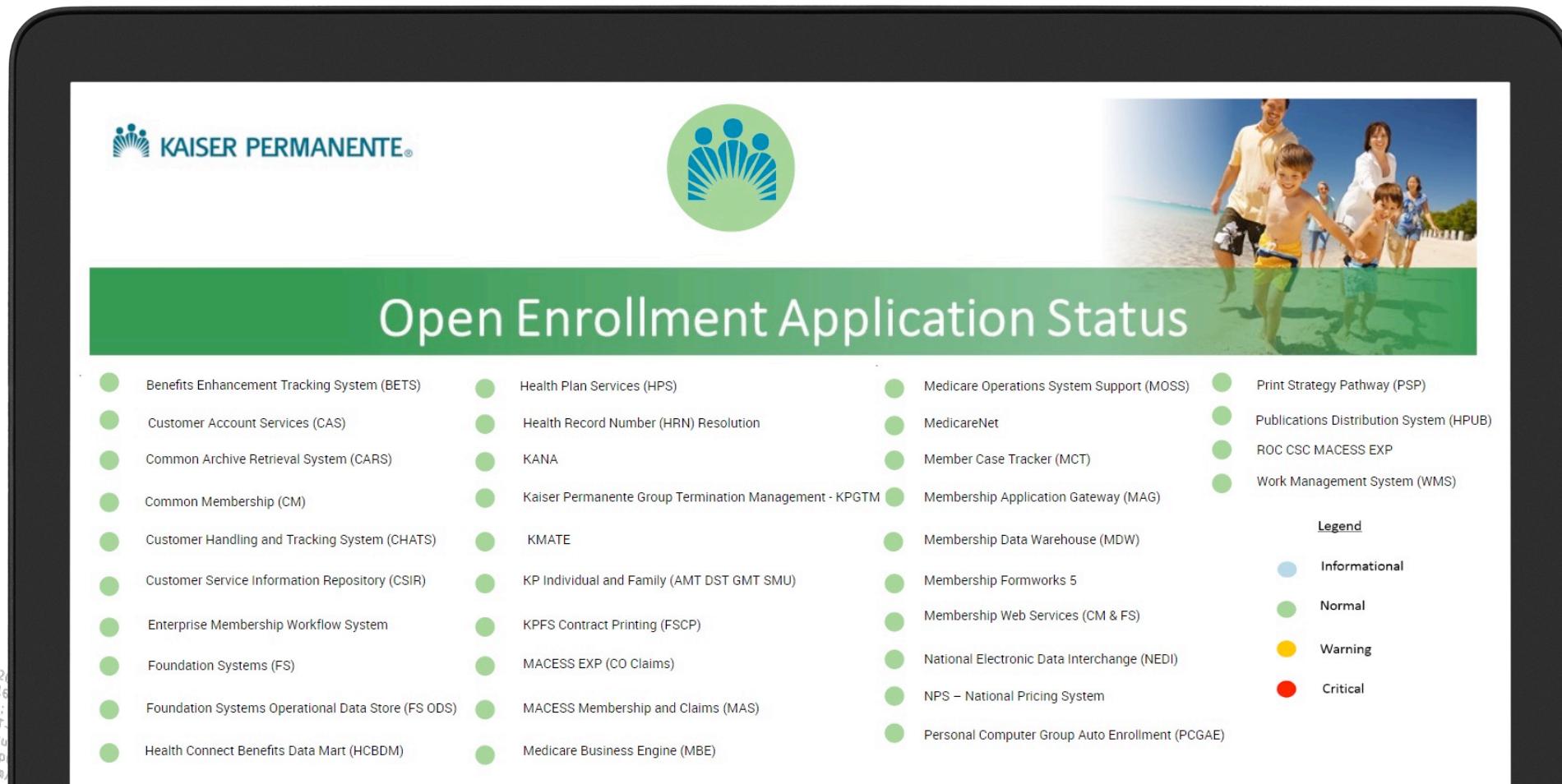
- Informational
- Normal
- Warning
- Critical

Our Success & Impact





An Automated, Single View of All Services End-to-End



The image shows a smartphone displaying a dashboard titled "Open Enrollment Application Status". The dashboard features the Kaiser Permanente logo at the top left and a circular logo with three stylized figures in the center. A background photograph of a family walking on a beach is visible behind the title. The main content area is a grid of green circles, each representing a different system or service. A legend on the right side maps colors to service status levels: light blue for informational, green for normal, yellow for warning, and red for critical.

System	Status
Benefits Enhancement Tracking System (BETS)	Normal
Customer Account Services (CAS)	Normal
Common Archive Retrieval System (CARS)	Normal
Common Membership (CM)	Normal
Customer Handling and Tracking System (CHATS)	Normal
Customer Service Information Repository (CSIR)	Normal
Enterprise Membership Workflow System	Normal
Foundation Systems (FS)	Normal
Foundation Systems Operational Data Store (FS ODS)	Normal
Health Connect Benefits Data Mart (HCBDM)	Normal
Health Plan Services (HPS)	Normal
Health Record Number (HRN) Resolution	Normal
KANA	Normal
Kaiser Permanente Group Termination Management - KPGTM	Normal
KMATE	Normal
KP Individual and Family (AMT DST GMT SMU)	Normal
KPFS Contract Printing (FSCP)	Normal
MACESS EXP (CO Claims)	Normal
MACESS Membership and Claims (MAS)	Normal
Medicare Business Engine (MBE)	Normal
Medicare Operations System Support (MOSS)	Normal
MedicareNet	Normal
Member Case Tracker (MCT)	Normal
Membership Application Gateway (MAG)	Normal
Membership Data Warehouse (MDW)	Normal
Membership Formworks 5	Normal
Membership Web Services (CM & FS)	Normal
National Electronic Data Interchange (NEDI)	Normal
NPS – National Pricing System	Normal
Personal Computer Group Auto Enrollment (PCGAE)	Normal
Print Strategy Pathway (PSP)	Normal
Publications Distribution System (HPUB)	Normal
ROC CSC MACESS EXP	Normal
Work Management System (WMS)	Normal

Legend

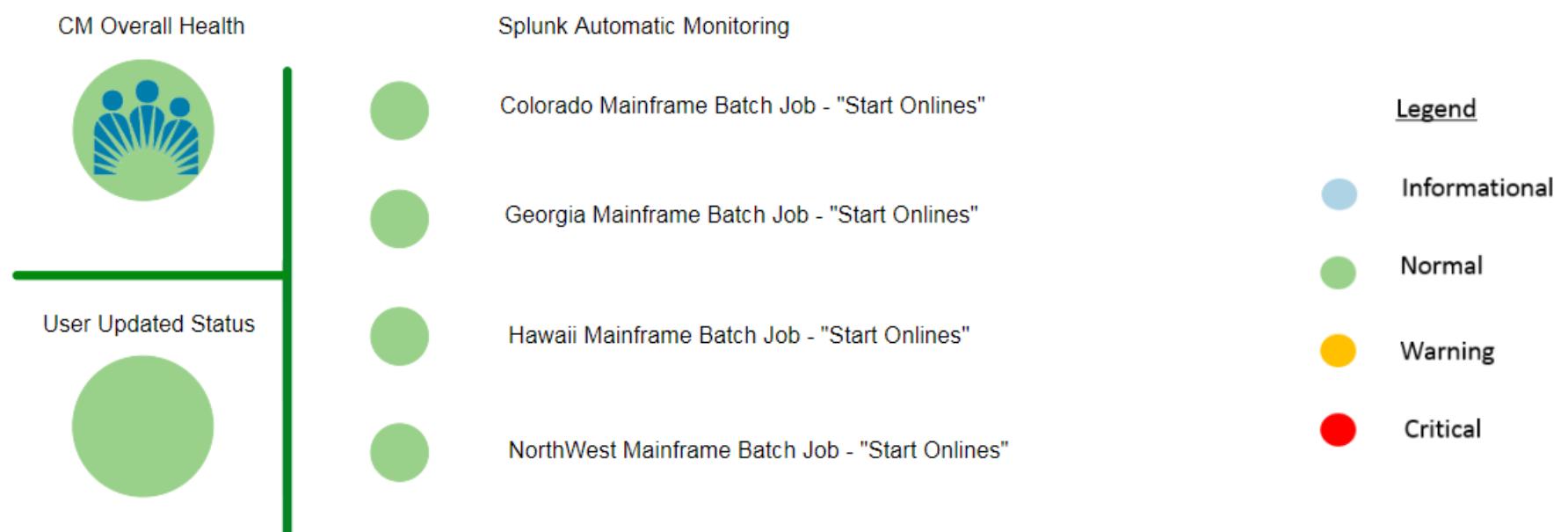
- Informational
- Normal
- Warning
- Critical



Service Configuration (CM)

► Common Membership (Colorado, Georgia, Hawaii, Northwest)

- Search Query
 - Entity:
Split by Fields
 - Calculation:
Average per Entity
Max Aggregate over
the past 5 minutes
every 1 minute
 - Thresholding:
Implemented for Scoring
 - Color Schema:
Implemented for KPIs



Service Configuration (CM)



► Common Membership (Colorado, Georgia, Hawaii, Northwest)

- Search Query
- Entity:
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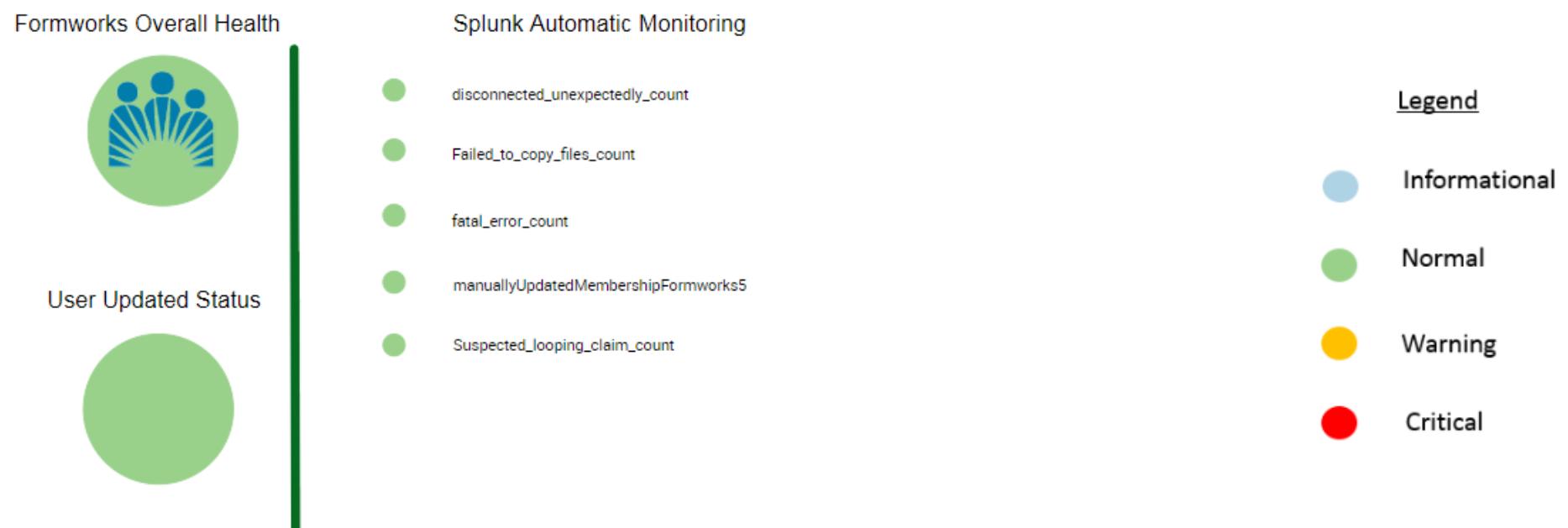




Service Configuration (Frameworks v5)

► Formworks v5 (Exceptions, Errors, etc)

- Search Query
 - Entity:
Split by Fields
 - Calculation:
Average per Entity
Max Aggregate over
the past 5 minutes
every 1 minute
 - Thresholding:
Implemented for Scoring
 - Color Schema:
Implemented for KPIs

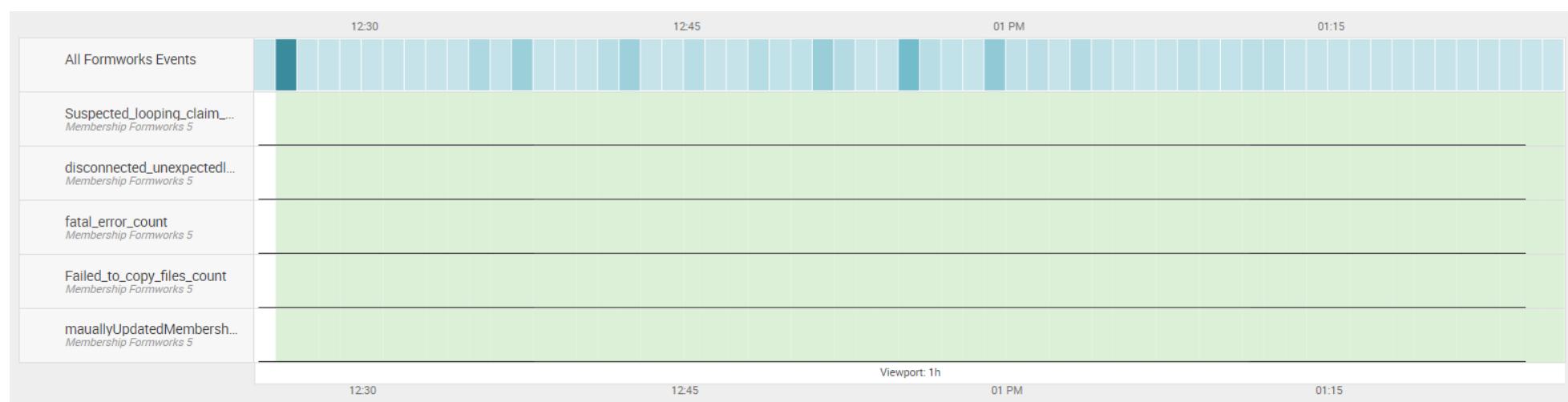




Service Configuration (Frameworks v5)

► Formworks v5 (Exceptions, Errors, etc)

- Search Query
 - Entity:
Split by Fields
 - Calculation:
Average per Entity
Max Aggregate over
the past 5 minutes
every 1 minute
 - Thresholding:
Implemented for Scoring
 - Color Schema:
Implemented for KPIs



Dashboard Design – Data Flow and Linkage

splunk> App: ASG_HP_OPEN_ENROLLMENT_MONITOR

Open Enrollment: Stop Mainframe Onlines - Daily Batch Job Status

Last 7 days Hide Filters

Foundation Systems					Common Membership - Colorado		Common Membership - Georgia		Common Membership - Northwest		Common Membership - Hawaii								
 9 count					 7 count		 4 count		 6 count		 8 count								
Foundation Systems					Common Membership - Colorado		Common Membership - Georgia		Common Membership - Northwest		Common Membership - Hawaii								
Job End Time	Job End Date	LPAR	Job Name	Job Return Code	Job End Time	Job End Date	LPAR	Job Name	Job Return Code	Job End Time	Job End Date	LPAR	Job Name	Job Return Code	Job End Time	Job End Date	LPAR	Job Name	Job Return Code
20:01:09:97	2018-06-04	P20G	IDCODEAL	0	18:15:44:93	2018-06-04	P20F	CPMSDEAL	0	19:09:40:23	2018-06-04	P20F	PMSGDEAL	0	20:07:10:35	2018-06-04	P20F	PMSPDEAL	0
14:05:30:08	2018-06-03	P20G	IDCODEAL	0	18:02:35:18	2018-06-03	P20F	CPMSDEAL	0	20:55:52:23	2018-06-03	P20F	PMSGDEAL	0	19:02:15:32	2018-06-03	P20F	PMSPDEAL	0
17:53:55:82	2018-06-02	P20G	IDCODEAL	0	22:55:44:60	2018-06-02	P20F	CPMSDEAL	0	19:08:05:21	2018-05-31	P20F	PMSGDEAL	0	23:57:06:06	2018-06-02	P20F	PMSPDEAL	0
14:10:21:11	2018-06-02	P20G	IDCODEAL	0	18:15:43:75	2018-06-01	P20F	CPMSDEAL	0	19:09:02:24	2018-05-30	P20F	PMSGDEAL	0	20:07:21:57	2018-06-01	P20F	PMSPDEAL	0
23:36:30:52	2018-06-01	P20G	IDCODEAL	0	18:16:05:61	2018-05-31	P20F	CPMSDEAL	0	20:07:01:05	2018-05-31	P20F	PMSPDEAL	0	20:00:58:73	2018-06-04	P20H	PMSHDEAL	0
20:01:49:01	2018-06-01	P20G	IDCODEAL	0	18:15:42:65	2018-05-30	P20F	CPMSDEAL	0	20:07:07:79	2018-05-30	P20F	PMSPDEAL	0	20:00:41:63	2018-06-03	P20H	PMSHDEAL	0
20:01:18:19	2018-05-31	P20G	IDCODEAL	0	18:16:06:30	2018-05-29	P20F	CPMSDEAL	0	20:01:11:96	2018-06-01	P20H	PMSHDEAL	0	20:00:56:98	2018-05-31	P20H	PMSHDEAL	0
20:06:58:21	2018-05-30	P20G	IDCODEAL	0	20:22:12:31	2018-05-29	P20G	IDCODEAL	0	20:01:03:14	2018-05-30	P20H	PMSHDEAL	0	20:00:54:03	2018-05-29	P20H	PMSHDEAL	0

About Support File a Bug Documentation Privacy Policy

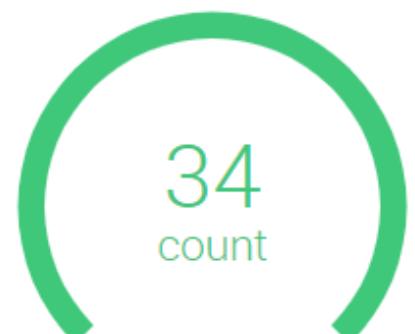
nf18

Dashboard Design – Data Flow and Linkage

Open Enrollment: Manually Updated Application Status

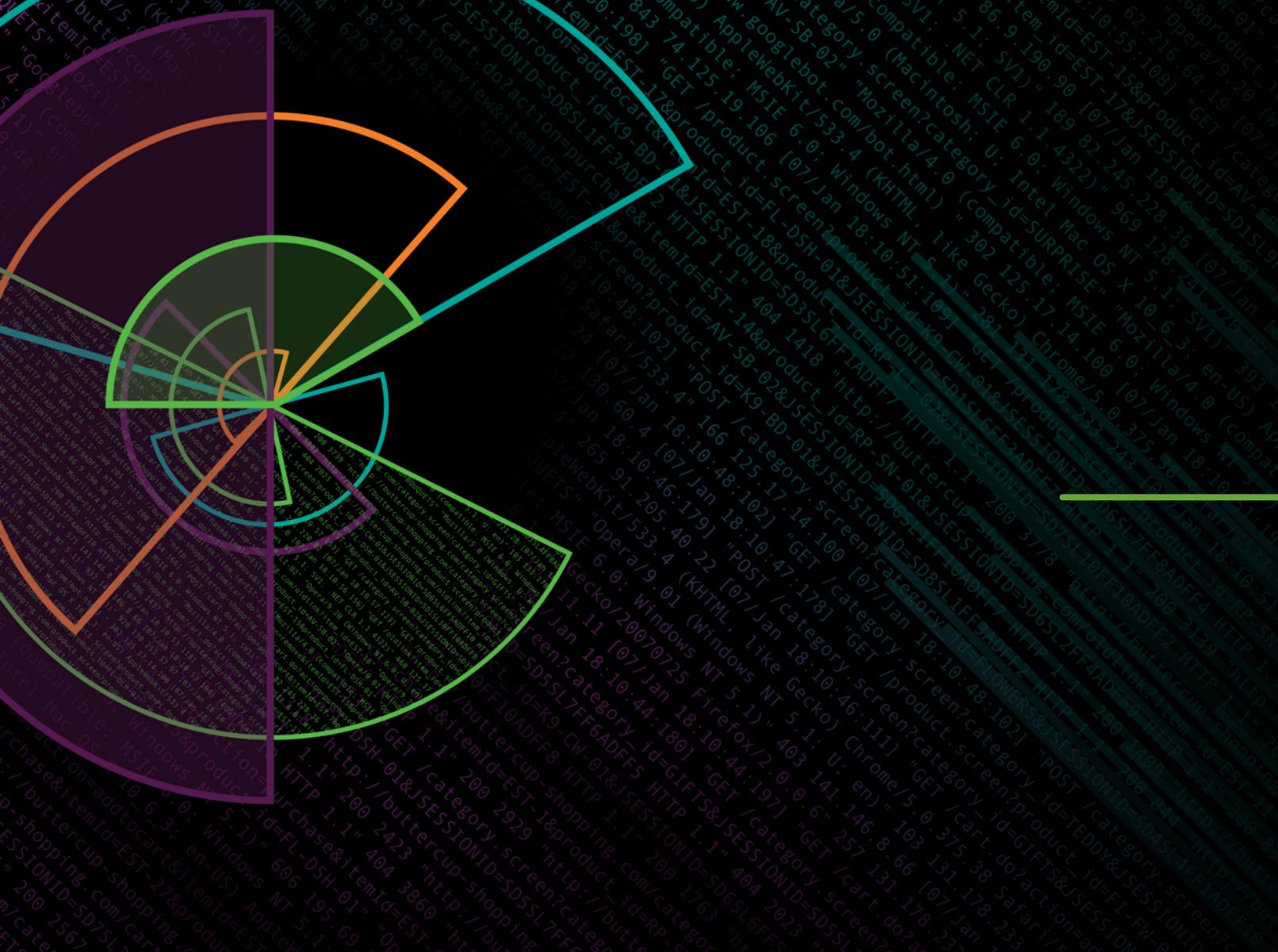
Normal

Applications In Normal State



	Application Name	Application Status	Updated By	Updated Time	Status Change Comments
1	Benefits Enhancement Tracking System (BETS)	Good	Paul Holguin	02/22/2018 21:39:01	Verification test
2	Common Archive Retrieval System (CARS)	Good	Najrul X. Shaikh	01/31/2018 23:49:21	Good. Updated by L1.5
3	Common Membership (CM)	Good	Balamurugan B. Jayakumar	01/31/2018 14:57:55	Good. Updated by L1.5
4	Customer Account Services (CAS)	Good	Suresh kumar ram X. Lalmani	01/31/2018 11:47:15	Status - Green
5	Customer Handling and Tracking System (CHATS)	Good	Najrul X. Shaikh	01/31/2018 23:52:14	Good. Updated by L1.5
6	Customer Service Information Repository (CSIR)	Good	Malcolm X. Anderson	02/02/2018 07:36:39	Good

Benefits





Customer Discovery (ASG Open Enrollment) - Benefits

► Application Services Group – Open Enrollment

- Full user feedback was non-existent from the previous Sharepoint perspective
 - Availability of the statuses of the application; who was logging in to the dashboard, reviewing the dashboard, and making changes
 - OECC (OE Command Center) benefited with another level of visibility to check updates to application
 - Was able to address support issues and concerns by having an additional set of dashboards to compare status of application health



Customer Discovery (ASG Open Enrollment) – Manual to Automated

► Application Services Group – Open Enrollment

- Overall Health to Individual Application Health Visibility
 - Several Applications were automated
 - Automating all of the applications resulted in saving **~900 hours** of operational expenditures through the Open Enrollment period
 - Understanding the viewers and their feedback on having the automation available from executive team/leadership on down.

Conclusion



Key Takeaways

1. Manual to Automation of Application, OS, and Infrastructure Service Health
2. Delivering Real-Time Value for the ASG – Open Enrollment
3. Offering ITSI internally as a Service Offering for additional monitoring use cases for internal customers.

Q & A

Thank You

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