



Exceptional service in the national interest

Problem Management using Lean Principles and Confluence Technology

Marquita Apodaca, Paula Schindele

NLIT 2022

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia LLC, a wholly owned subsidiary of Honeywell International Inc. for the U.S.

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.





Introductions

Marquita Apodaca

I have a passion for all things relating to Enterprise Architecture and Data Architecture! I have been with Sandia for 12 years and overall experience within the Department of Energy including Los Alamos National Labs and National Nuclear Security Administration for the past 20 years in various roles in IT Project Management and Enterprise Architecture. I hold certifications in The Open Group Architecture Framework (TOGAF), Scaled Agile Framework (SAFe) Product Owner/Product Manager and am a Certified Scrum Master.

Paula Schindele

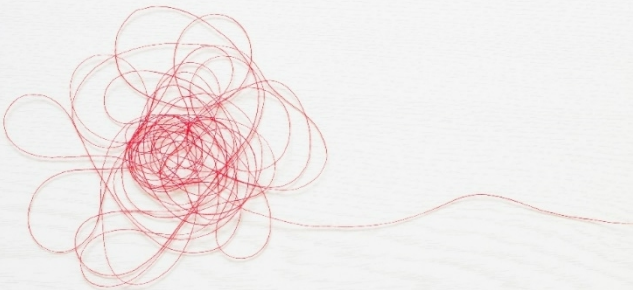
I have a passion for all things relating to Quality and Process Improvement! I have been with Sandia for the past 8 years and worked in Quality over the past twenty years. I am a Juran, Villanova, and Lockheed Martin certified Black Belt. I also have extensive experience in Lean and Six Sigma and am a certified Lead Auditor for ISO 9001:2015 and AS9100D.



Problem Management Defined

The purpose of the problem management practice is to reduce the likelihood and impact of incidents by identifying actual and potential causes of incidents, and managing workarounds and known errors. (ITIL)

- Reduce the number and severity of IT service issues
- Identify underlying causes of IT service issues
- Develop solutions to identified causes
- Improve service availability and performance
- Increase Customer and User satisfaction with IT services





FY22 Challenges and Opportunities



A Retirement
And
A New Team



- 32 Process Steps
- 10 Decision Points
- 3 Process Determination points
- 9 Supporting Documents

```

graph LR
    A[Review Input Problem] --> B[Database SEARCH REVIEW]
    B --> C{Problem record already exists in PDB?}
    C -- Yes --> D[Create/Update Problem Investigation Document]
    C -- No --> D
    D --> E{Workaround in Place?}
    E -- Yes --> F[Knowledge Management Process]
    F --> A
    E -- No --> G[Write Duplicate Problem to Existing Problem Record]
    G --> H[Submit/Generate/Submit Investigation]
  
```



```

graph TD
    A[Knowledge Management Process] --> B[Knowledge Management Process]
    B --> C{Change implemented?}
    C -- No --> D[Alternative Solution Study Process]
    C -- Yes --> E[Change Management Process]
    E --> F{Feedback?}
    F -- No --> D
    F -- Yes --> A
  
```

- Select Status=Assigned
Note: This will open the Update Status dialog
Update Status

Update Status

Problems Investigation Status [\(expand\)](#)

Marking this Problem Investigation as Closed will prevent you from making further edits to the record.

Target Date [\(expand\)](#)
 Mar 28, 2016 @ 11:00 AM

Classification [\(expand\)](#) [\(expand\)](#)
 Enterprise Middleware Problem Classification [\(expand\)](#)
 Support Group [\(expand\)](#) [Assigned to](#) [\(expand\)](#)
 CS&M Program Edward J O'Grady

Note

ADICs and Solutions Identification complete.
 Ticket content is sufficient.
 Closing ticket.

Understanding the Work in Progress

Record Tally







59 Open Records Problem Records

~150 open/pending
Corrective Actions


Project ID	Project Name	Manager	Status	Progress (%)	Start Date	End Date	Due Date	Priority	Team Lead	Team Members	Notes
PROJ001	Website Redesign	John Doe	In Progress	75	2023-01-15	2023-06-30	2023-06-30	High	John Doe	Jane Smith, Bob Johnson	Website redesign project for the company's main site.
PROJ002	Mobile App Development	Jane Smith	On Hold	10	2023-02-01	2023-08-15	2023-08-15	Medium	Jane Smith	Mike Davis, Emily White	Mobile app development for the company's new product line.
PROJ003	Database Migration	Bob Johnson	Completed	100	2022-11-01	2023-01-10	2023-01-10	Low	Bob Johnson	John Doe, Jane Smith	Database migration project for the company's legacy system.
PROJ004	Marketing Campaign Launch	Emily White	In Progress	60	2023-03-01	2023-07-31	2023-07-31	Medium	Emily White	Mike Davis, John Doe	Marketing campaign launch for the company's new product line.
PROJ005	IT Infrastructure Upgrade	Mike Davis	On Hold	20	2023-04-01	2023-09-30	2023-09-30	High	Mike Davis	Jane Smith, Bob Johnson	IT infrastructure upgrade project for the company's data center.
PROJ006	Customer Portal Development	John Doe	In Progress	85	2023-01-01	2023-06-15	2023-06-15	Medium	John Doe	Jane Smith, Bob Johnson	Customer portal development for the company's e-commerce site.
PROJ007	HR System Integration	Jane Smith	On Hold	15	2023-02-15	2023-08-31	2023-08-31	Medium	Jane Smith	Mike Davis, Bob Johnson	HR system integration project for the company's new HR system.
PROJ008	Product Feature X Development	Bob Johnson	In Progress	90	2023-01-01	2023-05-31	2023-05-31	High	Bob Johnson	John Doe, Jane Smith	Product feature X development for the company's new product line.
PROJ009	Security Audit	Emily White	Completed	100	2022-12-01	2023-01-15	2023-01-15	Low	Emily White	John Doe, Jane Smith	Security audit project for the company's IT infrastructure.
PROJ010	Website Performance Optimization	John Doe	In Progress	50	2023-03-15	2023-07-15	2023-07-15	Medium	John Doe	Jane Smith, Bob Johnson	Website performance optimization project for the company's main site.
PROJ011	Mobile App UI Redesign	Jane Smith	On Hold	5	2023-04-15	2023-09-15	2023-09-15	Medium	Jane Smith	Mike Davis, Bob Johnson	Mobile app UI redesign project for the company's new product line.
PROJ012	Database Backup Automation	Bob Johnson	Completed	100	2022-11-15	2023-01-05	2023-01-05	Low	Bob Johnson	John Doe, Jane Smith	Database backup automation project for the company's legacy system.
PROJ013	Marketing Campaign Strategy	Emily White	In Progress	40	2023-03-15	2023-07-15	2023-07-15	Medium	Emily White	Mike Davis, John Doe	Marketing campaign strategy project for the company's new product line.
PROJ014	IT Infrastructure Security Audit	Mike Davis	On Hold	10	2023-04-15	2023-09-15	2023-09-15	High	Mike Davis	Jane Smith, Bob Johnson	IT infrastructure security audit project for the company's data center.
PROJ015	Customer Portal Beta Testing	John Doe	In Progress	70	2023-01-15	2023-06-15	2023-06-15	Medium	John Doe	Jane Smith, Bob Johnson	Customer portal beta testing project for the company's e-commerce site.
PROJ016	HR System Integration Planning	Jane Smith	On Hold	5	2023-02-15	2023-08-31	2023-08-31	Medium	Jane Smith	Mike Davis, Bob Johnson	HR system integration planning project for the company's new HR system.
PROJ017	Product Feature X Beta Testing	Bob Johnson	In Progress	80	2023-01-01	2023-05-31	2023-05-31	High	Bob Johnson	John Doe, Jane Smith	Product feature X beta testing project for the company's new product line.
PROJ018	Security Audit Planning	Emily White	Completed	100	2022-12-01	2023-01-15	2023-01-15	Low	Emily White	John Doe, Jane Smith	Security audit planning project for the company's IT infrastructure.
PROJ019	Website Performance Optimization Planning	John Doe	In Progress	30	2023-03-15	2023-07-15	2023-07-15	Medium	John Doe	Jane Smith, Bob Johnson	Website performance optimization planning project for the company's main site.
PROJ020	Mobile App UI Redesign Planning	Jane Smith	On Hold	5	2023-04-15	2023-09-15	2023-09-15	Medium	Jane Smith	Mike Davis, Bob Johnson	Mobile app UI redesign planning project for the company's new product line.


Problem Ticket Task Summary


Tasks by Problem Ticket

Problem Investigation ID	Problem Summary	Task Link	Task ID
PBI000000056911			TAS00000013178
PBI000000056811			TAS00000013113
PBI000000056811			TAS00000013113
PBI000000056811			TAS00000013114
PBI000000056811			TAS00000013117
PBI000000056811			
PBI000000056811			
PBI000000056811			
PBI000000056611			
PBI000000056611			

+ Add Task







3/29/21



Tasks (14)

Digging for the Information

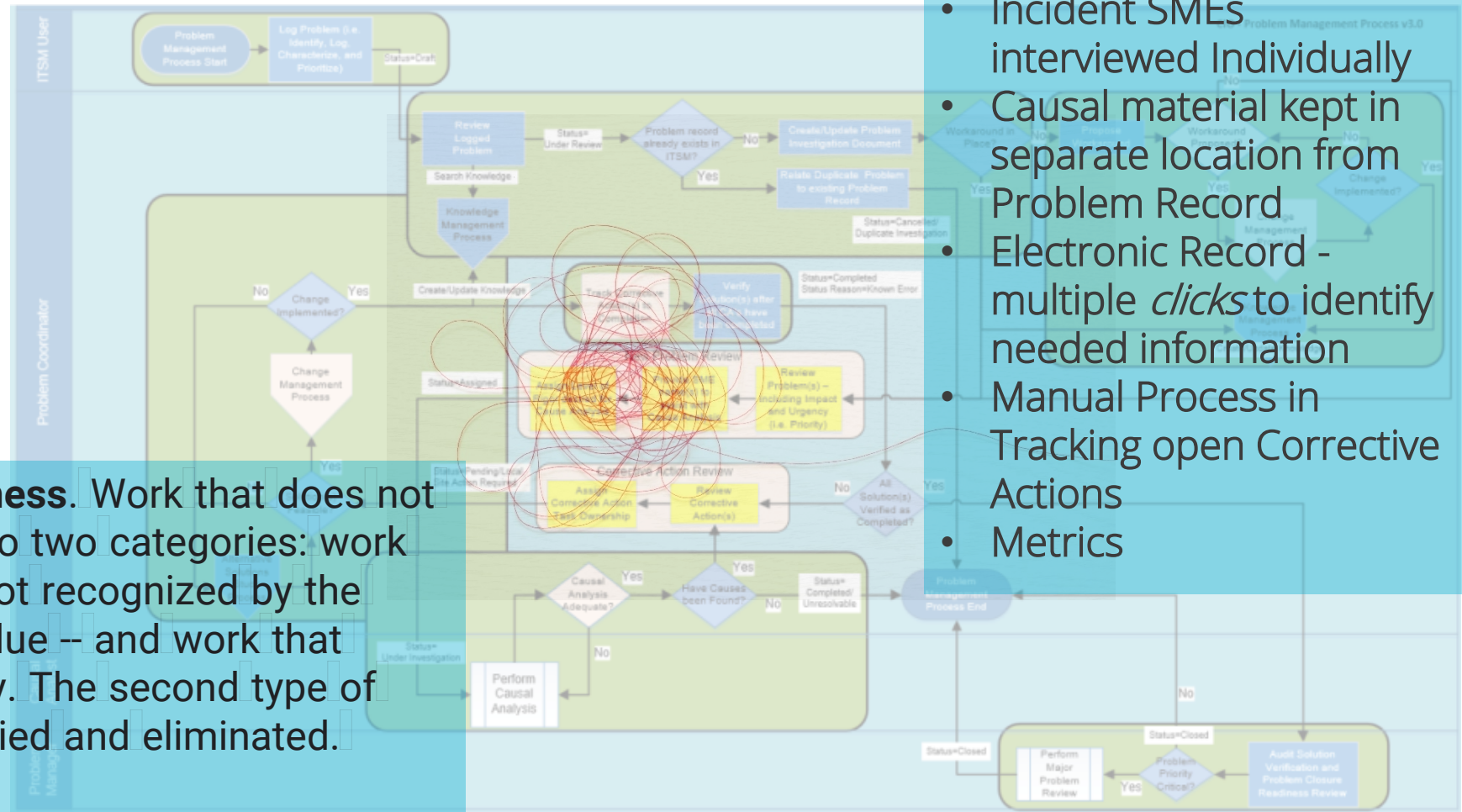
- Working from Confluence List ID Record
- SmartIT open record
- ID open task
- Contact Assignee



Evaluating the Process



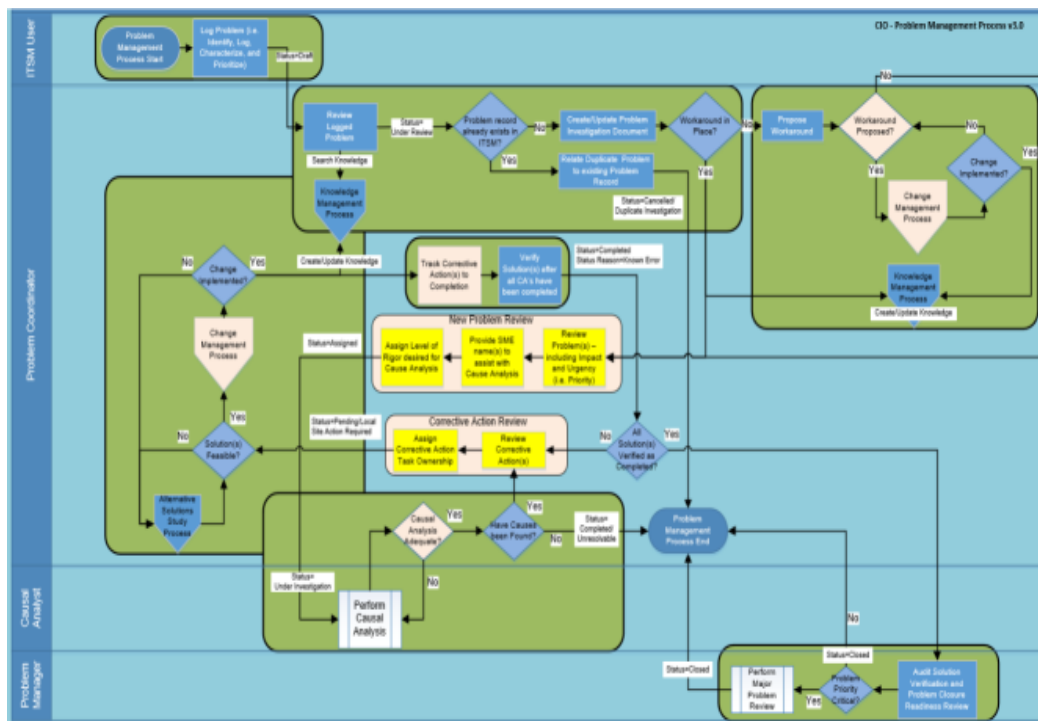
Muda means **wastefulness**. Work that does not add value is divided into two categories: work that is necessary but not recognized by the customer as adding value -- and work that simply is not necessary. The second type of Muda should be identified and eliminated.



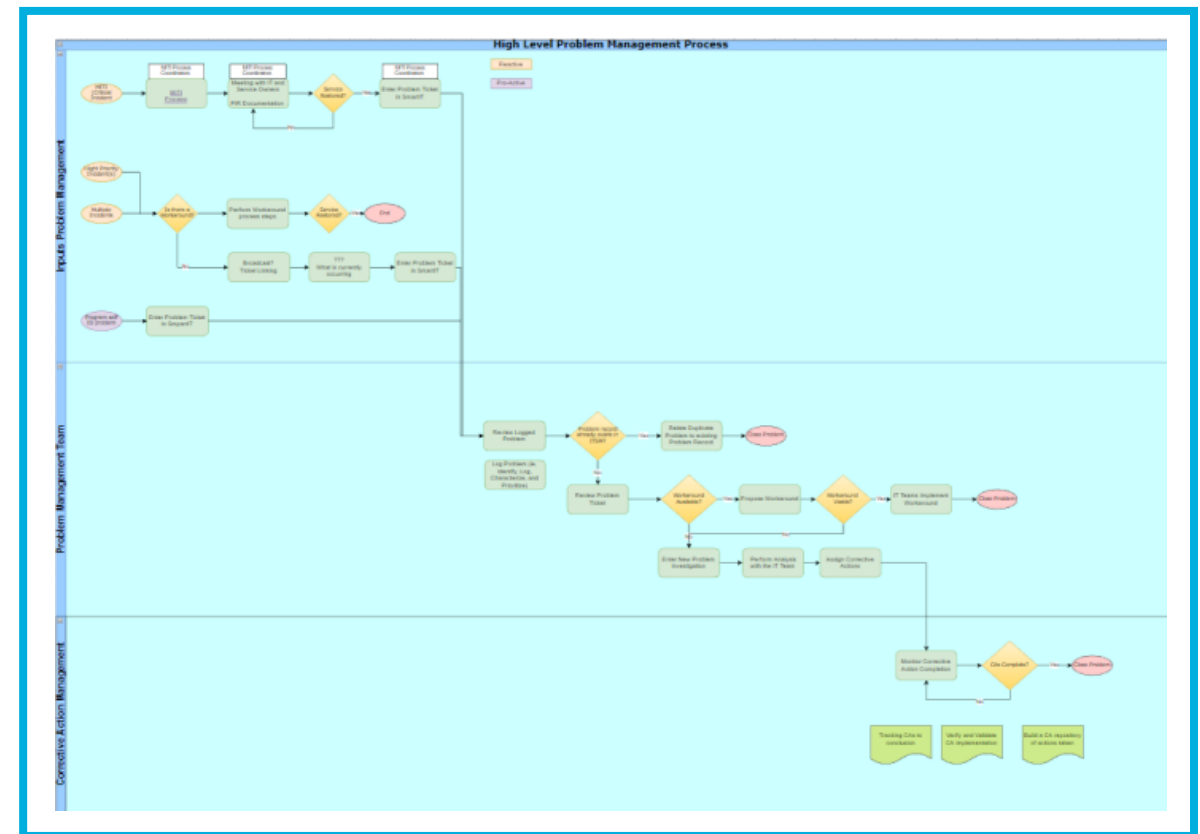


Applying LEAN to Problem Management Process

From This



To This





Inputs to Problem Management

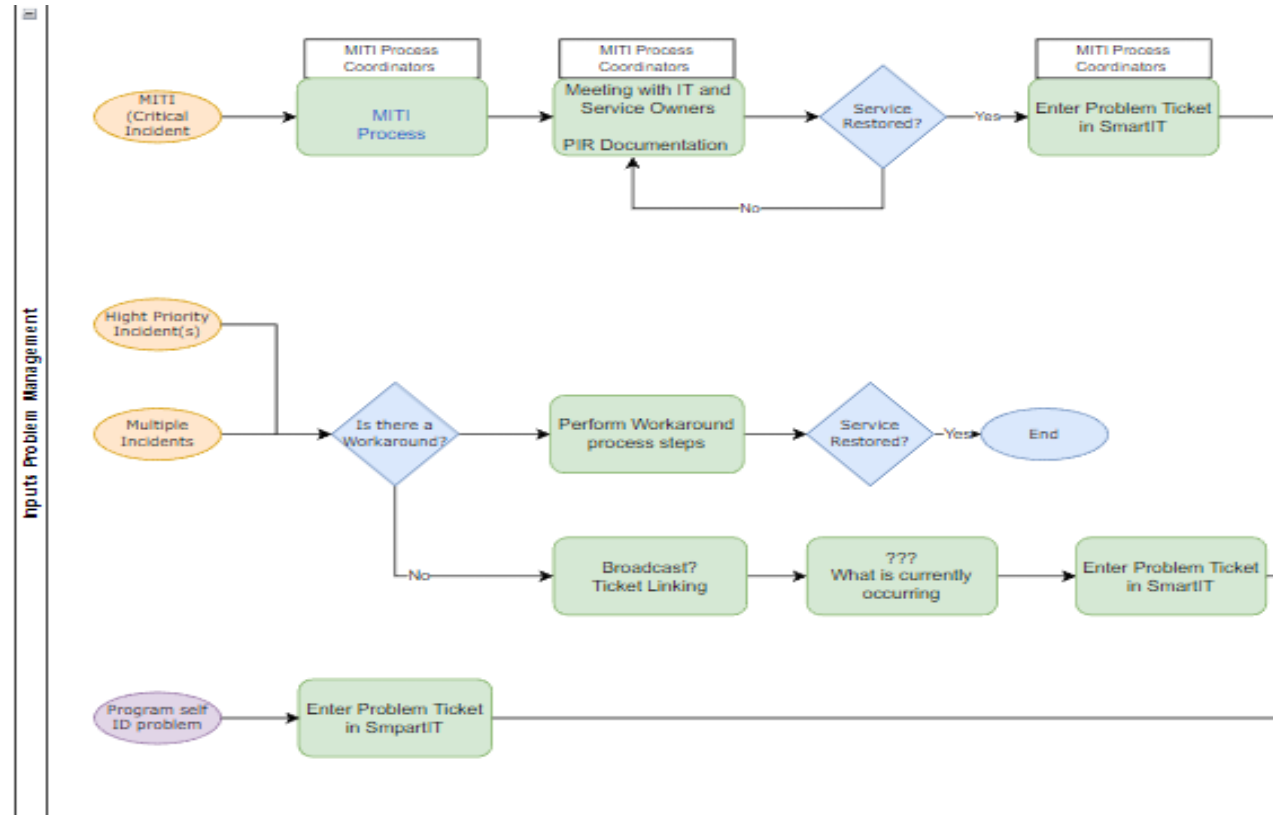


Reactive Entry

- Major IT Incident (MITI)
- High Priority Incident
- Multiple Incidents

Proactive Entry

- Program Request
- Tier Board Review
- Service Review





Post Incident Review (PIR)

PIR Template Captures:

- Incident Name
- Management Roles
- SmartIT Record Numbers
- Service Restoration Team
- TIMELINE
 - Tasks
 - SMEs
- Critical Services
- Resolution steps
- Lessons Learned



Incident Title		
Incident #:		
Manager Approving the MITI Declaration:		Date/Time MITI Declared:
Manager Approving MITI Closure:		Date/Time MITI Resolved:
Problem #:		PIR Review Date:

Issue Statement

- Date/Time issue started?
- Services, applications or infrastructure affected - (report from SOC and others)
 - What task/work can no longer be performed?
 - Is the issue intermittent or constant?
- Number of people currently affected - (report from Service Owner/SME and others)
- Number of users or calls coming into the desk - (report from CCHD and others)
- What is your DR Tier? What is your RTO? Do you have a DR Plan?
- Did anything change? (i.e. scheduled change, certificate expires, patching, Microsoft push)
 - What is the related CRQP?
- What communications should be issued - (Advised by CIO Comm team)

Service Restoration Team

List all personnel involved in the restoration effort.

Team/Support Group Name (i.e., Network)	SME Name (i.e., Joseph Maures, Jim Smith)

Timeline

☐ Type your task here, using "@" to assign to a user and "/" to select a due date

Please include details including updates, log entries, or any other data used to identify

Date	Time	SME	

MITI Emails

MITI Meeting Agendas

Sandia Duty Manager

Incident Management ITSM Page

Link to create: Outage Record

Critical Services List

Tier 9	Service Owner

What are the emergency changes submitted to resolve this issue? (list all)

What went well during the change or recovery?

Lessons Learned:

Supporting information: (i.e. Attachments, SOC Screen Shot, Email Threads or process reference)

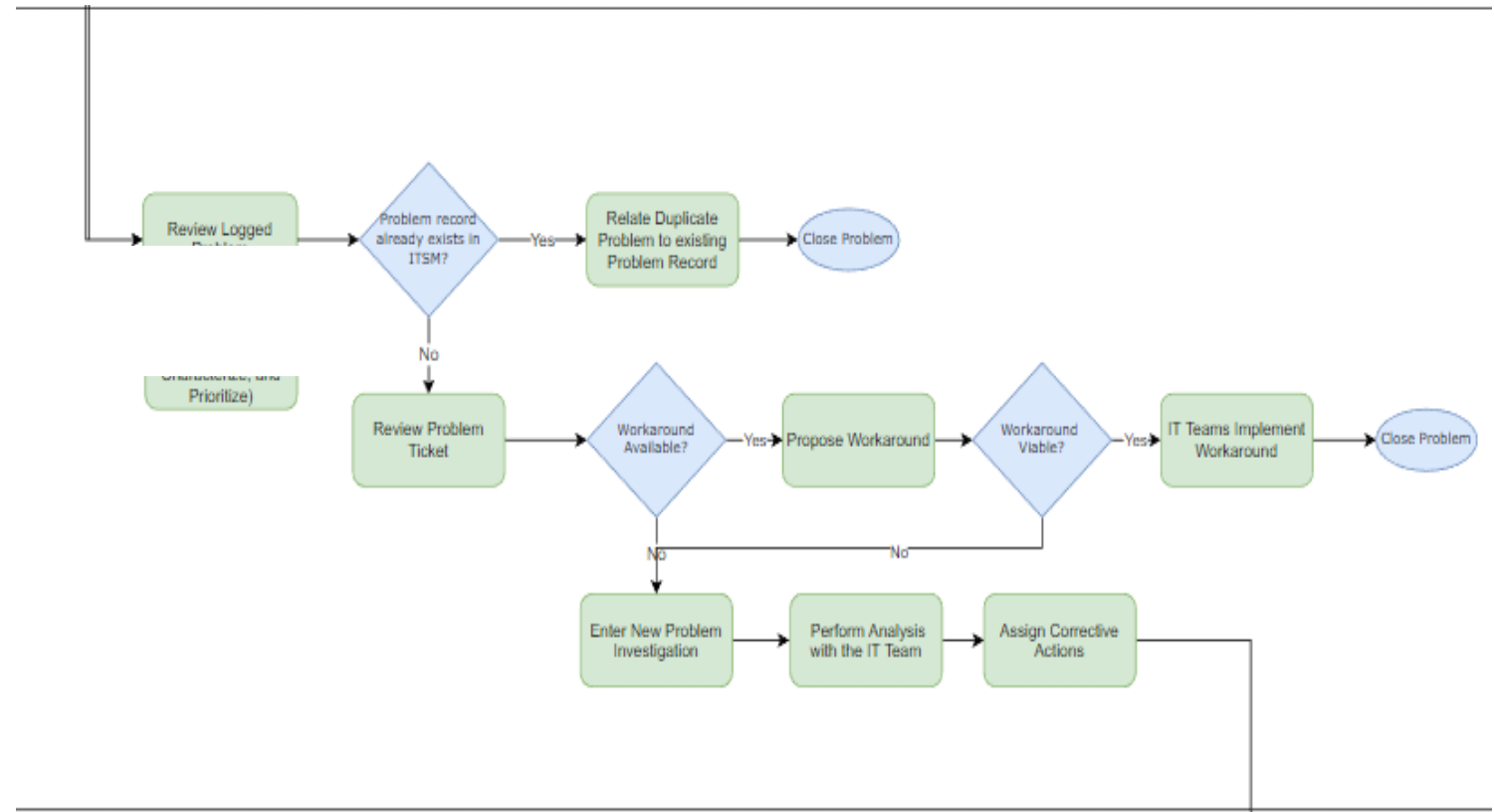


Problem Management Process



Problem Management

- Review Logged Problem and PIR report
- Open Problem Record in Confluence
 - If Problem is known relate to existing record
 - If Workaround exist, IT Team Implements, relate workaround to record
- Schedule Problem Investigation
- Hold Problem Investigation with identified SMEs
- Record Corrective Actions





Problem Investigation



Page title

Cause Analysis for: PBI Ticket Link MITI Ticket Link: MITI Incident Ticket Link Date: 10 Feb 2022

PM Lead:

Services that were impacted:

Problem Investigation Activities

Activity	POC	Date	Update
Capture communication, meeting and communication information here			

- Is automated monitoring in place for the service or asset affected? What system is used _____
- Was an FMEA completed for the service or asset? If FMEA in place was this Failure noted and what restoration was required and was it used? _____

Lessons Learned: (from Post Incident Review (PIR) stored in MITI Ticket)

Problem Statement: _____

Problem Investigation: (5 Whys, Causal Map, etc.)

Why 1	Why 2	Why 3	Why 4	Why 5	Root Cause
1					
2					

Team Notes (Additional Information or Parking Lot Items):

Note	POC

Corrective Actions: (Actions assigned that when put in place will prevent problem from occurring in the future)

Create tasks in the CA Task column by using the ☒ icon or typing "[" then "]", Type the CA summary, using "@" to assign to a user and "/" to select a due date

CA Number	CA Task	Reminder Date	Response
PIO#-0#	use the <input checked="" type="checkbox"/> icon or type "[" then "]"	Use Handy Reminder Macro for Reminder Date Notification	Describe the Definition of Done for the CA
PIO#-+1			

Problem Template Captures:

- Problem Title
- Links to SmartIT Records
- PIR – Data
 - Services Impacted
 - Lessons Learned
- Questions on
 - Automation
 - FMEA
- Problem Statement
 - 5-Why's
- Team notes
- Corrective Actions

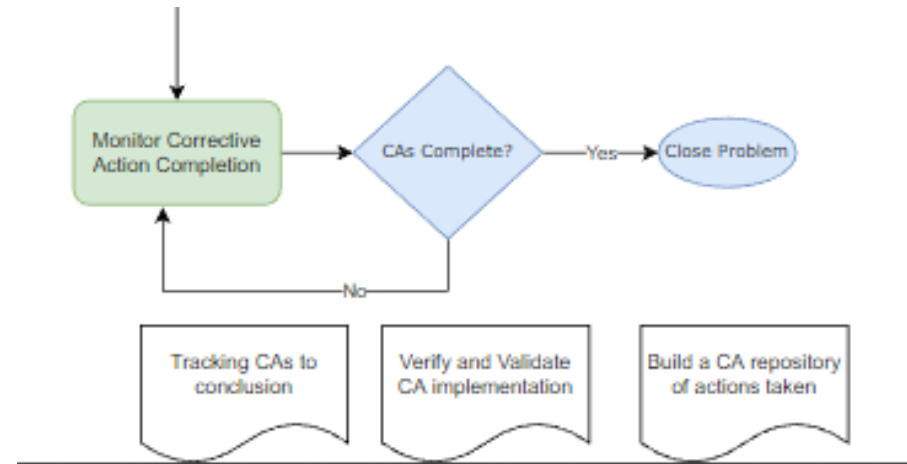


Corrective Actions



Action Reporting

- Using Automated Reminders
- Visual Review of Problem Investigation Reports
- Task Report
- MITI Log Reviewed Daily in CIO Dashboard





Managing Corrective Actions

- Task Assignments generated during Problem Investigation
 - Assigned
 - Date
 - Definition of Done
- Electronic Reminders
- MITI CA Log Review

Corrective Actions: (Actions assigned that when put in place will prevent problem from occurring in the future)

Create tasks in the CA Task column by using the ☒ icon or typing "[" then "]", Type the CA summary, using "@" to assign to a user and "/" to select a due date

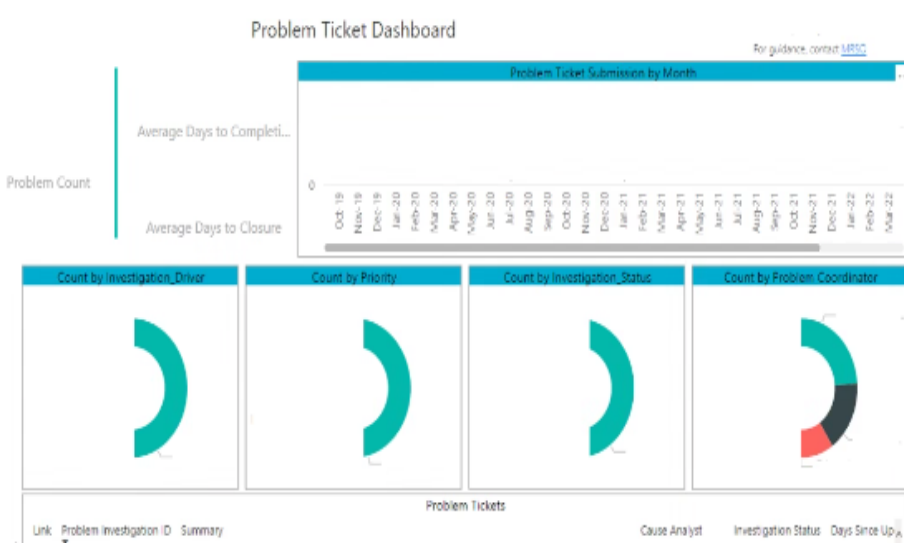
CA Number	CA Task	Reminder Date	Response
PI0#-0#	use the <input checked="" type="checkbox"/> icon or type "[" then "]"	Use Handy Reminder Macro for Reminder Date Notification	Describe the Definition of Done for the CA

Date Issue Observed	Status	Issue Description/Confluence Problem Ticket	MITI Ticket Or Incident Link	Cause Analysis Report (CAR)	Problem Ticket Link	Actual Time Between MITI (days)	FY Average Time Between MITI (days)	Rolling 90 Day MTBM	FY-nth	Change Related	CAs Status
COMPLETE			INC000003418442	5 Whys	PBI000000065612	0	14.42	14.07	12	yes	
COMPLETE			INC000003428735	5 Whys	PBI000000065611	24	14.42	14.07	11	yes	
COMPLETE			N/A	5 Whys	PBI000000064412	-	-	-	-	yes	COMPLETE
COMPLETE			NA	5 Whys	PBI000000065111	-	-	-	-	yes	4/4 Complete



Metrics FY23 Plan

From This



To This

FY23 Metric Plan – Automated Reporting

- Age of Open Records
 - Age of Open Corrective Actions
 - Record Status
- Actual Time Between MITI (days)
- Rolling 90 day MTBM
- Resolution Effectiveness Reviews
 - Repeated Problems





Technology Wins the Day





Problem Investigation Templates in Confluence

Our team used Confluence Templates to create a template to record new Problem Investigations and used Labels to organize the Problem Investigations on our home page

- With templates you can create multiple Problem Investigations that follow the same format
- You can easily modify the template at any time
 - Note: Changes made to the template will only apply to new Problem Investigations
- Labels can be used to organize pages on your Confluence Space using the Content by Label Macro
- You can automatically label pages that are created from your Template



Problem Investigation Template Example

Page title



^----Name your investigation first with the incremental number then your Problem: 0# - Problem Investigating. Make sure to delete this section afterward 😊 ----^

Cause Analysis for: PBI Ticket Link **MITI Ticket Link:** MITI Incident Ticket Link **Date:** 📅 10 Feb 2022 ← Change this

PM Lead:

Services that were impacted:

- Is automated monitoring in place for the service or asset affected? What system is used _____.
- Was an FMEA completed for the service or asset? If FMEA in place was this Failure noted and what restoration was required and was it used? _____.

Problem Investigation Activities

Activity	POC	Date	Update
Capture communication, meeting and communication information here			

Lessons Learned: (from Post Incident Review (PIR) stored in MITI Ticket)

Problem Statement: _____



Problem Investigation Template Example Continued

Problem Investigation: (5 Whys, Causal Map, etc.)

Why 1		Why 2		Why 3		Why 4		Why 5		Root Cause
1										
2										
3										
4										
5										

Arrow Toolbar



Team Notes (Additional Information or Parking Lot Items):

Note	POC


- Capture the 5 why's, can either be vertical or horizontal
- Parking lot area to capture info that is relevant to the 5 why's



Problem Investigation Template Example Continued

Corrective Actions: (Actions assigned that when put in place will prevent problem from occurring in the future)

Create tasks in the CA Task column by using the  icon or typing "[" then "]" , Type the CA summary, using "@" to assign to a user and "/" to select a due date

CA Number	CA Task	Reminder Date	Response
PIO#-0#	use the  icon or type "[" then "]"	Use Handy Reminder Macro for Reminder Date Notification	Describe the Definition of Done for the CA
PIO#-+1			

Extent of Condition (EoC) Review:

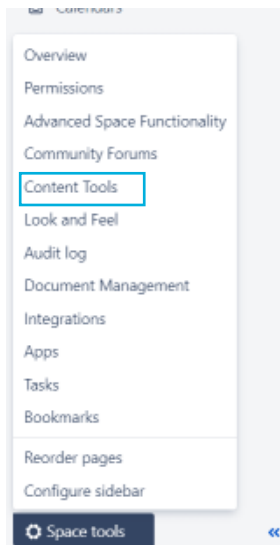
	Pre-Causal Analysis	Post-Causal Analysis
Situation:	N/A	
EoC Review:	N/A	



Creating a Template in Confluence

- You will need Admin permissions to the Space you wish to create a template in

Navigate to Space Tools -> Select Content Tools



On the next screen, you will click on the **Create New Template** button to create your template

Space Tools

Overview Permissions Advanced Space Functionality Community Forums Content Tools Look and Feel Audit log Document Management Integrations Apps Tasks

Bookmarks

Templates Reorder Pages Undefined Pages Attachments Trash Export RSS Feeds

User Created Templates

Create New Template

Name	Description	Last Updated By	Updated	Operations
Evidence Sheet Template	No description	Marquita Apodaca	Nov 06, 2019	Unpromote · Edit · Delete
SPARA Evidence Sheet Template	No description	Marquita Apodaca	Feb 24, 2021	Unpromote · Edit · Delete



Adding Labels to your Template

- When you add a label to your template, every page that is created using that template will automatically be labeled with the label name you created for it
- In our example here, we are using Label's to organize our home page using the Content by Label Macro.
- When you click on the label icon at the top of your template page, it will open a screen to add one or more labels

ITSM Problem Management Investigations / Templates



Problem Management Investigation

^-----Name your investigation first with the incremental number then your Problem

Cause Analysis for: PBI Ticket Link **MITI Ticket Link:** MITI Incident Ticket Link **D**

PM Lead:

Services that were impacted:

- Is automated monitoring in place for the service or asset affected? What system is used
- Was an FMEA completed for the service or asset? If FMEA in place was this Failure noted and what restoration was required and was it used?



Organizing Pages using Content by Label Macro

Here is a view of our home page, As you can see, we have the top 5 recent Problem Investigations

- These are automatically added to this section using the Content by Label Macro

📘

Create New Investigation from Template

Create New Problem Management Investigation

Recent Announcements

Blog Posts

📘

ITSM Problem Management Investigations Feb 17, 2022

📘

ITSM Problem Management Investigations Dec 03, 2021

Problem Analyses

Search

5 most recent Problem Investigations:

📘 23 -

📘 22 -

📘 21 -

📘 20 -

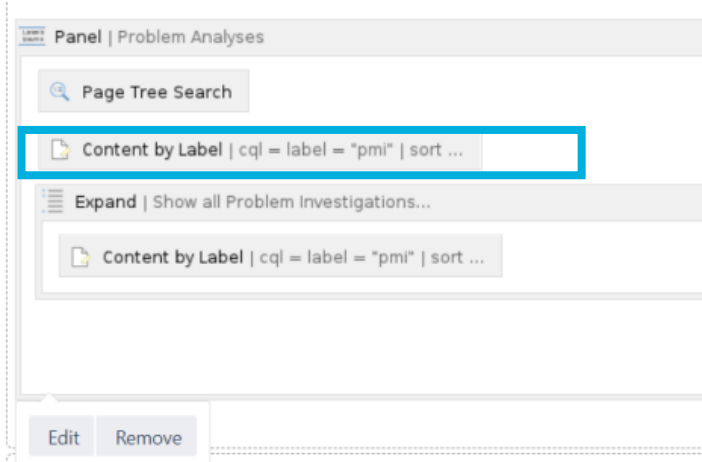
📘 19 -

[Show all Problem Investigations...](#)



Organizing Pages using Content by Label Macro

- To use the Content by Label, you will need to be in edit mode on your Confluence Page
- In our example we placed the Content by Label Macro within a Panel
- Once you are in edit mode for the Content by Label Macro, you can specify the name of the label you would like to organize
- We added a limit of 5 pages that will be displayed on the home page



Edit 'Content by Label' Macro

Label *
pmi x

[Add a filter](#)

Options [Hide](#)

Sort By
creation

☒ Reverse Sort
Used only in conjunction with the 'Sort By' parameter.

Maximum Number of Pages
5

List Title
5 most recent Problem Investigation



Task Tracker

In the Problem Investigation Template we created a space to track corrective actions and assign tasks to individuals

- The task tracker was added in order to easily indicate assignee, due date, and when a corrective action is completed

Corrective Actions: (Actions assigned that when put in place will prevent problem from occurring in the future)

Create tasks in the CA Task column by using the ☒ icon or typing "[" then "]". Type the CA summary, using "@" to assign to a user and "/" to select a due date

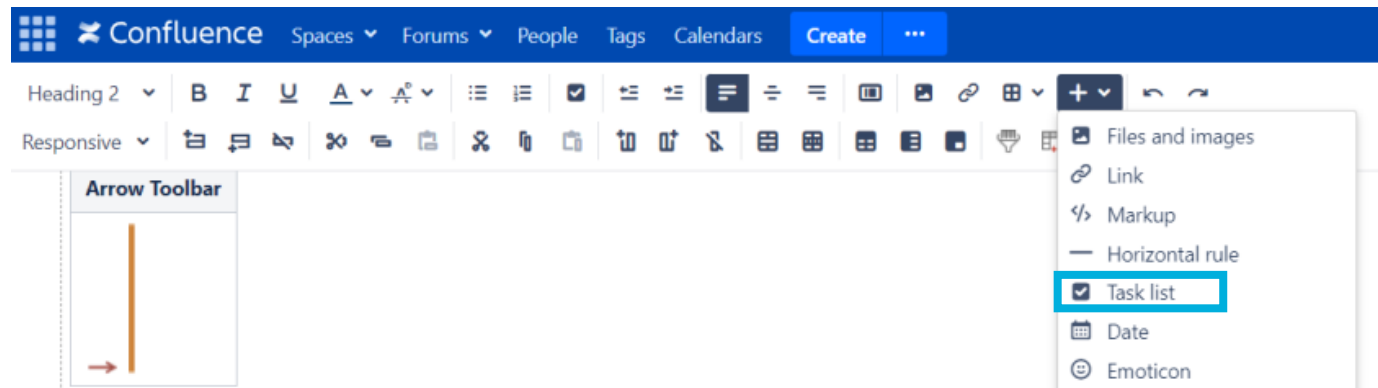
CA Number	CA Task	Reminder Date	Response
PI0#-0#	use the <input checked="" type="checkbox"/> icon or type "[" then "]"	Use Handy Reminder Macro for Reminder Date Notification	Describe the Definition of Done for the CA
PI0#-+1			



Task Tracker Continued

Adding a Task List can be accomplished in two different ways

1. Select the + at the top of the toolbar and select Task list



2. Type [] on the page

PI0#--+1	<input type="checkbox"/> Type your task here, using "@" to assign to a user and "/" to select a due date
----------	----------------------------------------------------------------------------------------------------------



Task Report Macro

We used the Task Report Macro to organize all open task assignments and display due dates and assignees

-The Task Report Macro displays a list of all open task assignments

All Corrective Actions from Investigations

Corrective Actions:

Description		Due date ↓	Assignee	Task appears on
<input type="checkbox"/>	[Redacted] @ [Redacted] 06 Jan 2022	06 Jan 2022	[Redacted]	[Redacted]



Task Report Macro Configuration

We configured the Task Report to only display open tasks and list the title of the task, the assignee, and the due date

-We also used Labels to only capture tasks on the Confluence Space that were labeled PMI

Edit 'Task report' Macro

Create a report of tasks from specific locations, people, status and more.

Space(s) and page(s)

Only show tasks from these spaces or pages

Label(s)

Only show tasks on pages with this label

Assigned to

Only show tasks assigned to these people

Created by

[Select macro](#)

Edit 'Task report' Macro

Only show tasks created on or after this date. Dates must be entered as dd-mm-yyyy.

Task status

Number of tasks per page

Columns to display

Allowed columns are description, duedate, assignee, location, completedate, labels

Sort by


☐ Reverse sort



Handy Reminder

The Handy Reminder Macro is used to send notifications to individuals assigned to corrective actions when their task is coming due

- To use the handy reminder tool you can type "{handy reminder}" or add it to the page using the + symbol at the top of the tool bar

PI0#-+1	<input type="checkbox"/> Type your task here, using "@" to assign to a user and "/" to select a due date		
---------	----------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	--



Handy Reminder Continued

Edit 'Handy Reminder' Macro

Message

Message to be sent in wiki format

☐ Show message next to icon

Next date *

27.09.2022

The next date to send remind notification

☐ Show date

Time to send *

8 : 00

Time in current time zone

Period *

Preview



Remind notifications will be sent on:
Tuesday, September 27, 2022

Edit 'Handy Reminder' Macro

27.09.2022

The next date to send remind notification

☐ Show date

Time to send *

8 : 00

Time in current time zone

Period *

Once

Recipients

Start typing user or group name

☒ Enabled

[Send test email](#)

When in edit mode for the Handy Reminder, you can

Set the notification date

Assign Recipients

Add a message to be included in the notification



SMART IT

Why we moved from BMC SMART IT to Atlassian Confluence:


- Simplification
 - Several Confluence Macros available for use
 - Tracking tasks can be done all on one page
 - Working the Problem on one page (documentation all in one place)
 - Easier to grant permissions to several users on a Confluence Space or Page
- SMART IT is not as user friendly
 - Configuration of permissions is more involved
 - Must configure reminders in SMART IT





How we use SMART IT for Problem Investigations

Problem Ticket in SMART IT

 Remedy Dashboard Console ▾ Calendar Smart Recorder More ▾ 🔍 👤 ▾

Create Problem Complete fields and "Save" to open Problem

Problem Title (required)

Impact (required)
4-Minor/Localized ▾

Urgency (required)
4-Low ▾

Calculated Priority:
Low

Company (required)
Sandia × ▾

Problem Status (required)
Draft ▾

Problem Description

0 / 100

Problem Location
TEMP × Unknown × TEMP / TEMP ×

Investigation Driver (required)
Non-Routine Incident ▾

Affected Service

Affected Asset

Operational Category ?

⚠️ 1 more required field(s).

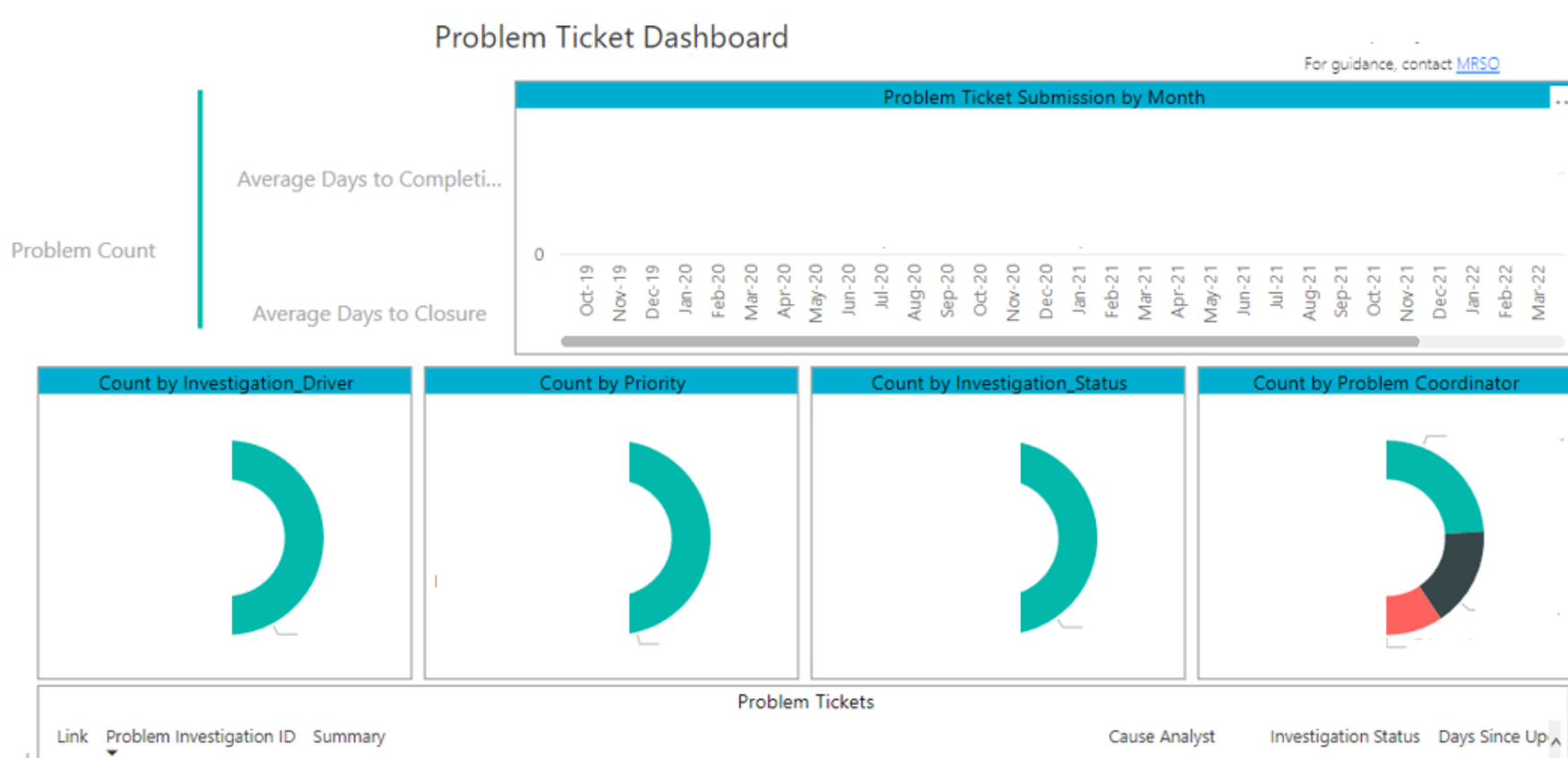
Save Ticket

Cancel



Metrics

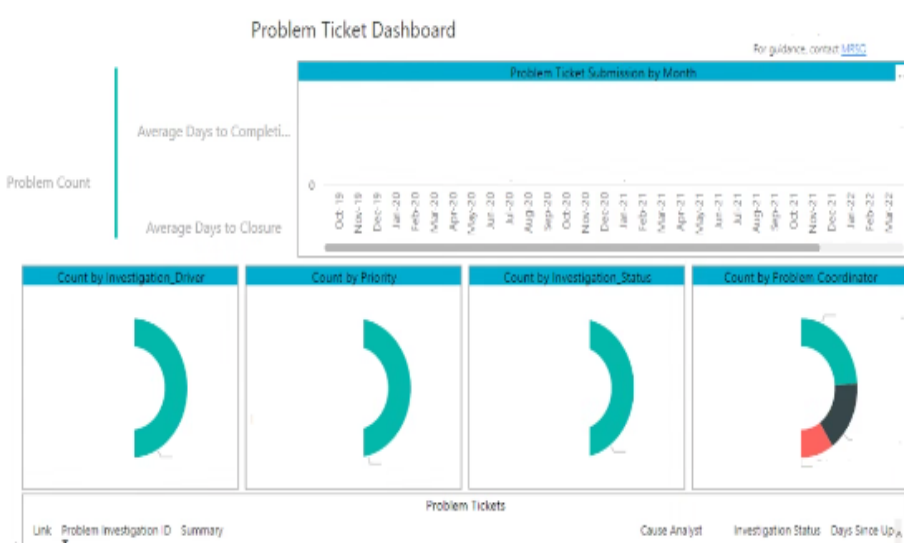
We use PowerBI to create a Problem Ticket Dashboard from the data in SMART IT





Metrics FY23 Plan

From This



To This

FY23 Metric Plan – Automated Reporting

- Age of Open Records
 - Age of Open Corrective Actions
 - Record Status
- Actual Time Between MITI (days)
- Rolling 90 day MTBM
- Resolution Effectiveness Reviews
 - Repeated Problems





Questions?