

Yale University Problem Management Process Guide



Learn more:

(888) 440-2730 x702
info@FruitionPartners.com
www.FruitionPartners.com

**RESEARCH
EDUCATE
IMPLEMENT**
bring IT to fruition.[™]

Table of Contents

- Introduction 3
 - Purpose 3
 - Scope..... 3
- Problem Management Overview..... 3
 - Problem Management Key Concepts 4
 - Problem Management Policies 5
- Problem Management Process Flow 6
- Roles and Responsibilities..... 6
- Process Procedures..... 8
 - 1.0 Problem Detection 8
 - 2.0 Problem Logging & Categorization 9
 - 3.0 Problem Prioritization & Assignment 9
 - 4.0 Investigation & Diagnosis..... 10
 - 5.0 Workaround Creation 11
 - 6.0 Known Error Creation 12
 - 7.0 Problem Resolution..... 13
 - 8.0 Problem Closure..... 14
 - 9.0 Major Problem Review..... 14
- Problem Sources 16
 - Problem Types 16
 - Problem Prioritization..... 17
 - Problem Closure Codes..... 18
 - Problem States 19
 - Process Metrics..... 20
- Document History 21

Introduction

Purpose

This document will serve as the official process of Problem Management for Yale University. This document will introduce a Process Framework and will document the workflow, roles, procedures, and policies needed to implement a high quality process and ensure that the processes are effective in supporting the business. This document is a living document and should be analyzed and assessed on a regular basis.

Scope

The scope of this document is to define the Problem Management Process, and process inputs from, and outputs to, other process areas. Other service management areas are detailed in separate documentation. This document includes the necessary components of the Process that have been confirmed for the organization.

Problem Management Overview

What is Problem Management?

- To prevent problems and resulting incidents from happening
- To eliminate recurring incidents
- To minimize the impact of incidents that cannot be prevented

Why is Problem Management Important?

- Stability! Mature Problem Management directly correlates to increased Service Availability
- Increase end-user satisfaction and perception
- More efficient usage of resources (less repetition of work, less firefighting, less overtime, more time to do proactive work)
- Better prioritized workloads and resource allocation
- Increased accountability, decreased turnaround time for Root Cause Analysis (RCA) Requests
- Increased Knowledge Management
- Increased transparency and awareness

Problem Management Key Concepts

Problem	<ul style="list-style-type: none"> A Problem is the unknown cause of one or more (potential or occurring) incidents.
Known Error	<ul style="list-style-type: none"> A problem that has a documented root cause. Optimally, determination of the root cause includes the identification of a workaround.
Root Cause Analysis	<ul style="list-style-type: none"> A Problem which we investigate and document the Root Cause of and provide this information to the requestor.
Incident	<ul style="list-style-type: none"> Something has broken and needs to be fixed right away... Restore normal service as quickly as possible. If it breaks again, you have another incident.
Workaround	<ul style="list-style-type: none"> A temporary solution to a problem. Provides the ability to restore service for the customer, potentially through alternative delivery means (e.g. print on a different printer).
Assumptions & Observations	<ul style="list-style-type: none"> Incidents can exist without problems. Problems primarily exist with Incident associations (reactive problem management). Incidents do not become problems - incidents are symptoms of a problem. Problems do not become changes. A request for change is an output of problem management as a result of solution identification. A workaround can be identified prior to a root cause being determined and hence, a known error. Workarounds can be identified by the problem resolution team, or others (e.g. customer, help desk etc.)
Reactive Problem Management	<ul style="list-style-type: none"> Executed as part of regular operations and triggered through day-to-day operational support Primarily driven by incidents, where trends are identified or where major incidents prompt a root cause analysis (RCA) review to minimize future impacts Goal is to remove recurring incidents and to provide service interruption workarounds prior to problem resolution
Proactive Problem Management	<ul style="list-style-type: none"> Executed as part of Continual Service Improvement (through proactive data analysis activities) or Service Transition activities (through the identification of acceptable known errors prior to production release of a new or changed service) Primarily driven by events or activities that have yet to cause a service impact (i.e. Incident) Typically introduced as the problem management or other processes mature/evolve (e.g. Release and Deployment Management)

Problem Management Policies

There will be one Problem Management Process for all of the IT organization.

Service Ownership is a critical component to assuring the quality of services provided by IT. The Service Owner must be designated for each service to be managed by the Problem Management process. The Service Owner works to ensure that any Problem that may impact their service is controlled.

Each Problem Analyst who works on a problem will be responsible for updating the Problem record and Problem status on an ongoing basis.

A major Problem is declared when the degree of impact on the user community is high and the complexity is low (Priority 1). This is based on the normal Priority Table taking impact and complexity into account. The Major Problem procedure will be followed for these problems.

When the root cause of a Problem is identified the Problem status will be changed into a Known Error (KE). KE information (including a workaround or Quick Fix) will be made available for the Incident Management Process.

Each Problem will be assigned a Priority based on complexity and urgency. The impact of a Problem describes how broadly the Problem will be realized. Complexity represents the effort required (cost, resourcing etc.) to diagnosis and resolve.

Each Problem will be assigned a Category using the same classification system used by Incident and Change Management.

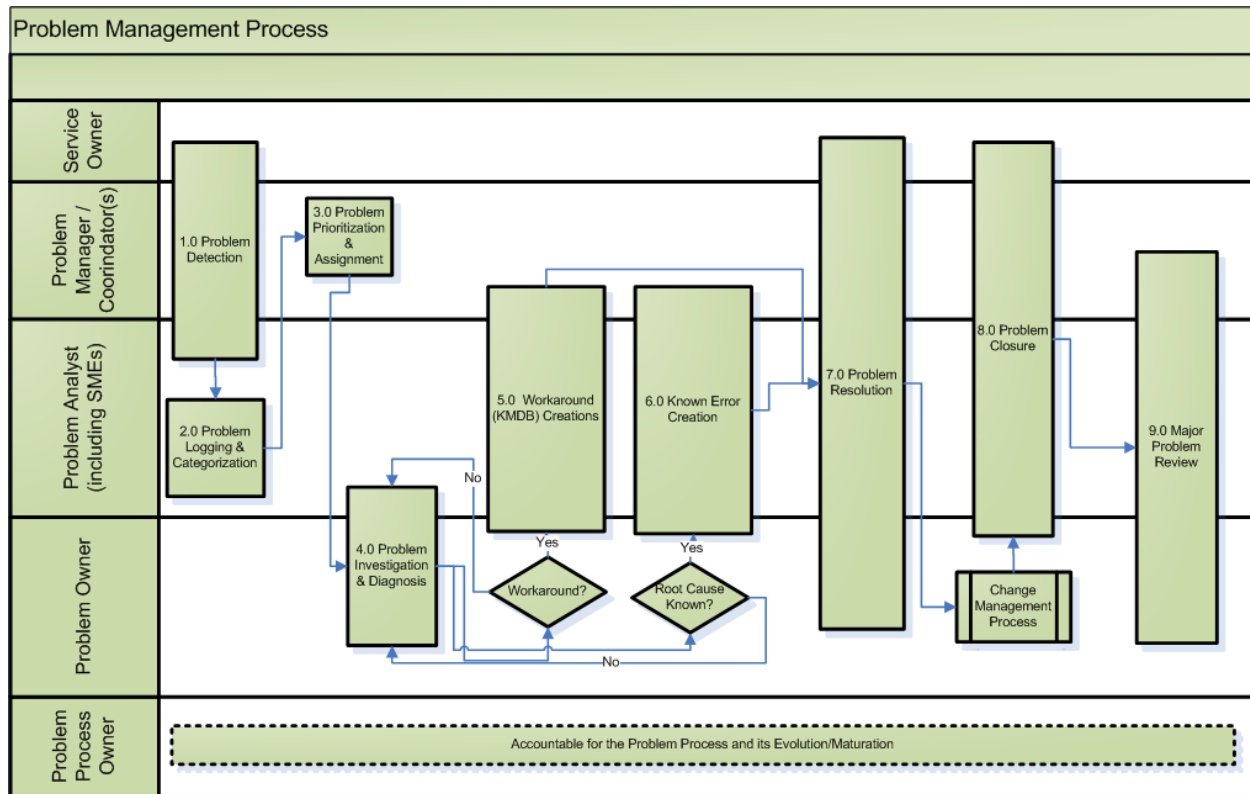
Problem investigations will determine the Root Cause and Configuration Item (CI) at fault.

The Problem Management process will identify the single best solution to the Known Error based on business requirements.

The Problem Manager will receive sufficient resources to perform the task of administrating the process of Problem Management. Resource requirements will be based on the scope of the problem. Resources from the business and technical analyst teams will be required. Problem teams may have the need to call on Users to help identify root causes. The business service owner will be responsible for arranging User support of problem teams.

After executing a successful Change resulting in the removal of a Known Error, that Change and that Problem will be evaluated for a period of time. This is to ensure that the Known Error has been permanently removed.

Problem Management Process Flow



Roles and Responsibilities

The following roles have been identified within the Problem Management Process.

Role	Description
Problem Management Process Owner	<ul style="list-style-type: none"> Ensures that all aspects of the problem management process are being executed effectively. The Problem Manager takes a quality assurance role over problem resolution teams and is responsible for assembling teams effectively.
Problem Owner	<ul style="list-style-type: none"> Assigned a problem and uses the Problem Analysts, Subject Matter Experts and others to help assess and resolve the assigned problem. In some cases, the Problem Owner will also be the Service Owner. The problem record will be assigned to the Problem Owner.
Problem Manager / Coordinator(s)	<ul style="list-style-type: none"> Manages execution of the Problem Management process and coordinates all activities required to respond to problems in compliance with SLAs and SLO's. Receives problem candidates, assesses against criteria and initiates the problem activities and eligible problems.
Service Owner	<ul style="list-style-type: none"> Ensures the service is managed with a business focus, the definition of a single point of accountability is absolutely essential to provide the level of attention and focus required for its delivery. The Service Owner is accountable for Continual improvement and the authorization of changes and improvements to the service and has financial accountability.

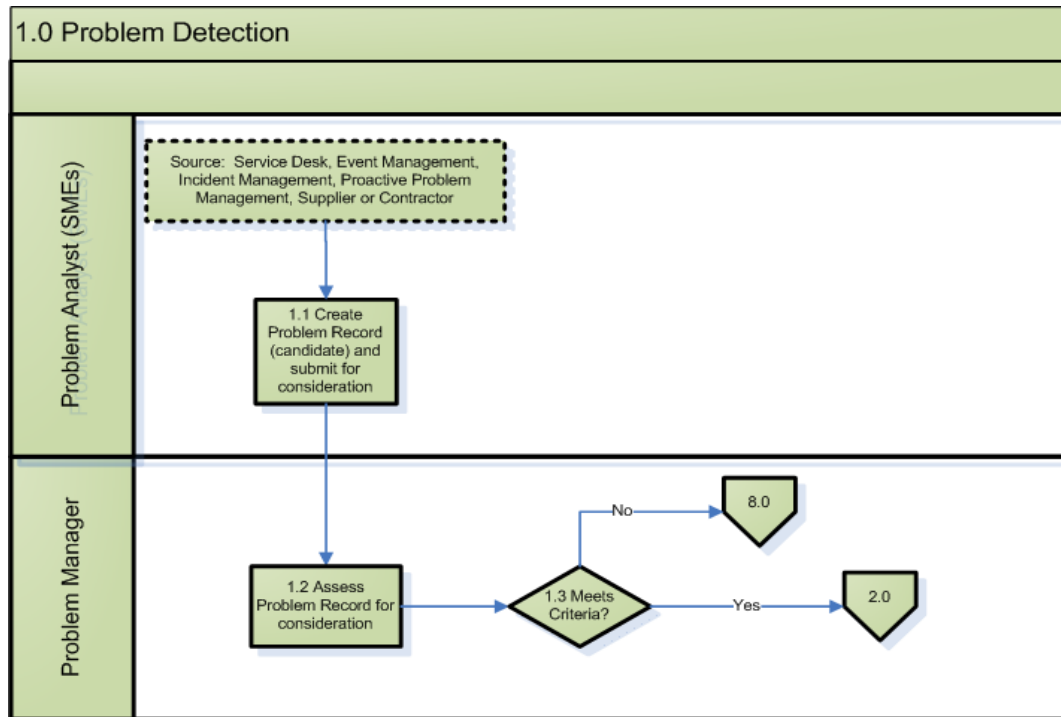
Role	Description
Problem Analyst (including SMEs)	<ul style="list-style-type: none"> As part of the resolution team, these resources come from stakeholders of a service and include but are not limited to the business analysts, technical analysts and Users of a service. Their responsibilities include assessing problems, investigating the root cause and evaluating workaround for effectiveness. The analyst is also responsible for producing the essential documentation. Subject matter experts may be called upon to provide specific guidance on a problem root cause or work around without actually be a member of the problem resolution team.

The following illustrates the Responsibility, Accountability, Consulted and Informed (RACI) matrix related to the key Problem Management Activities:

	Service Owner	Problem Manager / Coordinator	Problem Analyst (SMEs)	Problem Owner	Problem Process Owner
1.0 Problem Detection	R	AR	R		
2.0 Problem Logging & Categorization		A	R		
3.0 Problem Prioritization & Assignment	C	AR			
4.0 Problem Investigation & Diagnosis			R	AR	
5.0 Workaround (KMDB) Creation		A	R	R	
6.0 Problem Resolution	C	C	R	AR	
7.0 Problem Closure	C	C	R	AR	
8.0 Major Problem Review	C	A	R	R	C
Process Maturity and Evolution		R	R	R	A

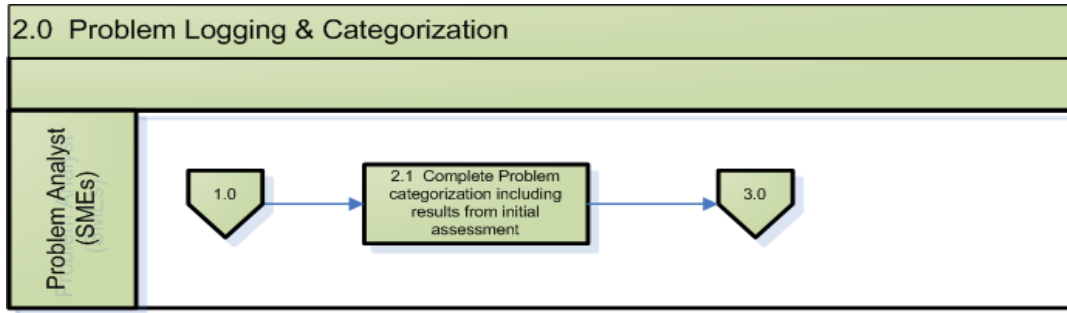
Process Procedures

1.0 Problem Detection



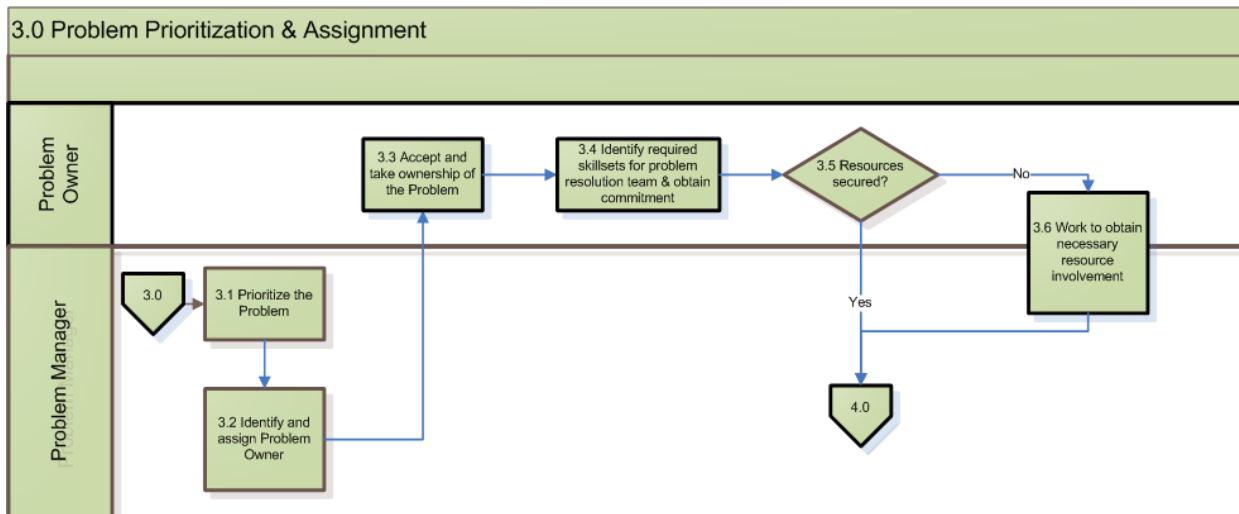
Step	Activities
1.1 Create Problem Record (candidate) and submit for consideration	<p>A problem can be triggered from a variety of sources. It generally is created from:</p> <ul style="list-style-type: none"> • Release Note or Vendor that states a known error • Major Incident where the root cause is unknown and problem investigation is requested by the Situation / Incident Manager • Proactive analysis of incident trend data <p>When a problem is detected, it is recorded with initial data and the rationale in considering the problem for further investigation. This could include the association of incidents, log reports through event management, written rationale from a Service Owner or notification from the developers or vendors stating a known error is released into the environment.</p>
1.2 Assess Problem Record for consideration	<p>Once a problem is detected it is assessed against pre-defined organizational criteria by the Problem Manager. During the initial stages of Problem Management, it may not be possible or logical to begin to work on ALL problems identified. There is some discretion the Problem Manager has to determine which ones will be addressed in what order. This criteria may simply based on the Priority of the Problem, ie only address Priority 1 Problems, or problems that have a minimum number of incidents associated, etc. The Problem Manager may choose to obtain input from a Steering Committee that can assist in committing resources.</p> <p>By implementing Problem Management, effort required for Incident Management will decline and resource effort will shift to Problem Management. Until PM is fully implemented and embraced in an organization judgment may be required in identifying the problems to be addressed.</p>
1.3 Meets Criteria?	<p>If the problem meets the criteria for continued investigation, move on to step 2.0 otherwise the problem record can be closed with rationale and notification back to the initial detector.</p>

2.0 Problem Logging & Categorization



Step	Activities
2.1 Complete Problem categorization including results from initial assessment	<p>Finalize all the coding and categorization (using same categorization as Incident) of the Problem making sure to associate all relevant incidents and include all relevant details, including but not limited to:</p> <ul style="list-style-type: none"> • User details • Problem details including service impacts, incident affects etc. • Equipment details • Priority and categorization • Associated Incidents • Details of all diagnostic or attempted recovery actions taken, for problem team consideration to create as a formal KM record <p>Also include a description of how the problem met the criteria to become a recognized problem.</p>

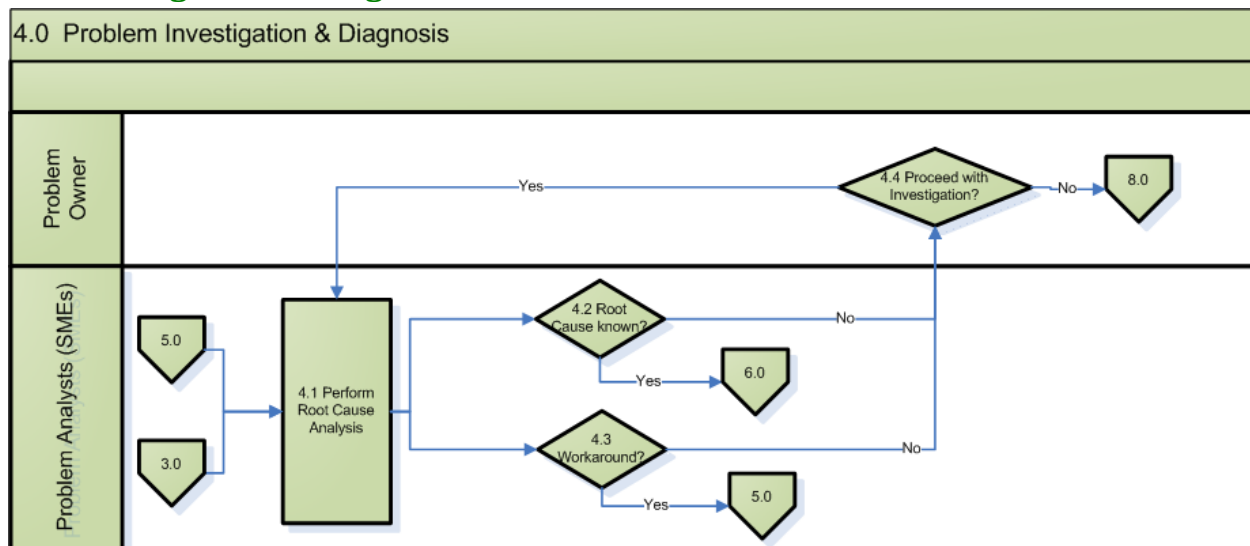
3.0 Problem Prioritization & Assignment



Step	Activities
3.1 Prioritize the Problem	Update the Problem record with Impact and Complexity based on the Priority Matrix. Problem prioritization is similar to Incident prioritization, however, it takes into account factors such as costs, effort to resolve etc.
3.2 Identify and assign Problem Owner	The Problem Manager determines who should be assigned ownership and assigns the Problem to the appropriate Problem Owner (which is often the Service Owner).

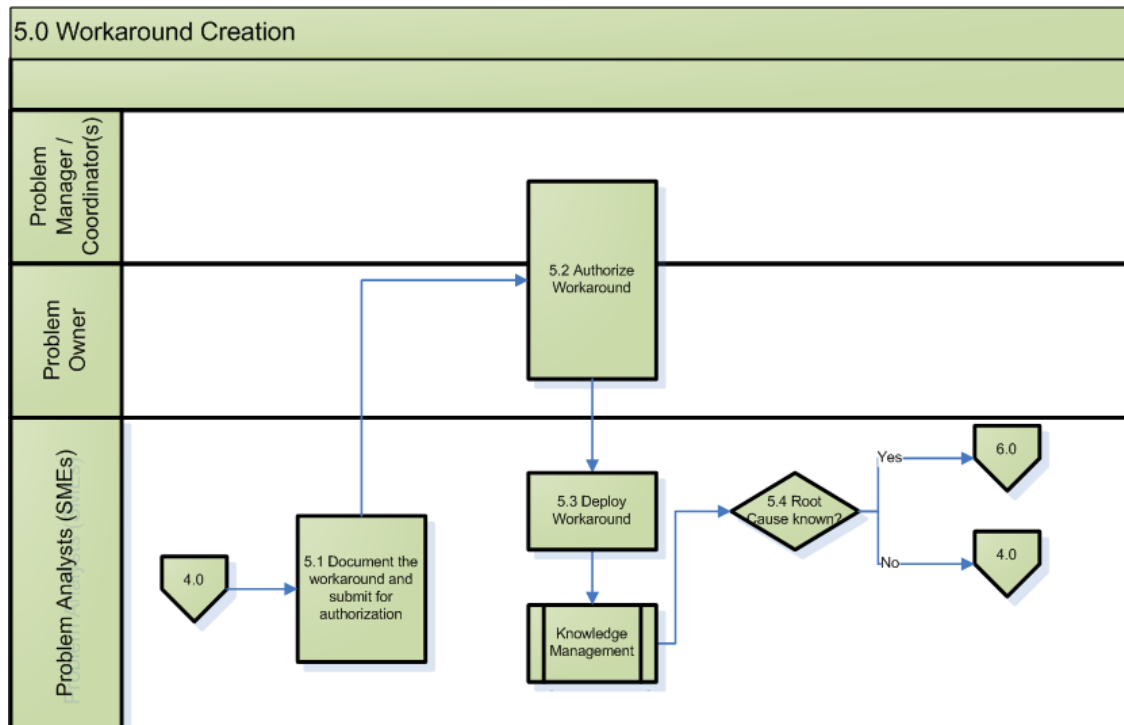
Step	Activities
3.3 Accept and take ownership of the Problem	The Problem Owner receives the problem record and accepts ownership.
3.4 Identify required skill sets for problem resolution team & obtain commitment	The Problem Owner determines who else is required to participate as part of the resolution team. The Problem Manager, along with the Problem Analysts identified are the core problem resolution team and SMEs can be called upon as needed to provide expertise during the investigation and resolution stage. Identification is performed through the creation of tasks that can be assigned to assignment groups for queue managers to identify a resource(s) to perform this activity. Assignees update the tasks as their investigation activities continue. The problem owner updates the problem task when/if required.
3.5 Resources Secured?	The Problem Owner seeks the required individual involvement and if successful the problem can continue on to the Investigation stage. If the Problem Owner is not successful in obtain resources the Problem Owner may need to work with the Problem Manager to escalate within the organization.
3.6 Work to obtain necessary resource involvement	The Problem Owner and Problem Manager may need to consider alternatives if desired resources are unavailable. For example, they may seek alternate SMEs, delay investigative activities, escalate to senior management, etc.

4.0 Investigation & Diagnosis



Step	Activities
4.1 Perform Root Cause Analysis	The resolution team, made up of Problem Analysts (and calling on SMEs as required), work at determining the root cause of the problem. The appropriate level of resource and attention is determined by the priority of the problem. Along with various problem solving techniques and tapping into available knowledge such as Known Error Database can help to pinpoint the point of failure. This step kicks off 2 potential questions... Is the root cause known and is there a workaround available. A workaround may not be known but root cause is known whereas a workaround may exist without knowing the root cause. These 2 streams can be done simultaneously.
4.2 Root cause known?	Once the root cause is known, proceed to the “known error creation” step.
4.3 Workaround?	If during the investigation and diagnosis stage a workaround is identified, process to the “workaround creation” step.
4.4 Proceed with investigation?	At any point in the process it may be determined that further investigation is not required. This decision is made by the Problem Owner in consultation with a variety of stakeholders including the Service Owner, SMEs, etc. It may be determined that the effort involved in further investigation does not out-weigh the benefit from resolving the problem. If the decision is made to NOT proceed with problem activities, it must be clearly noted in the problem record.

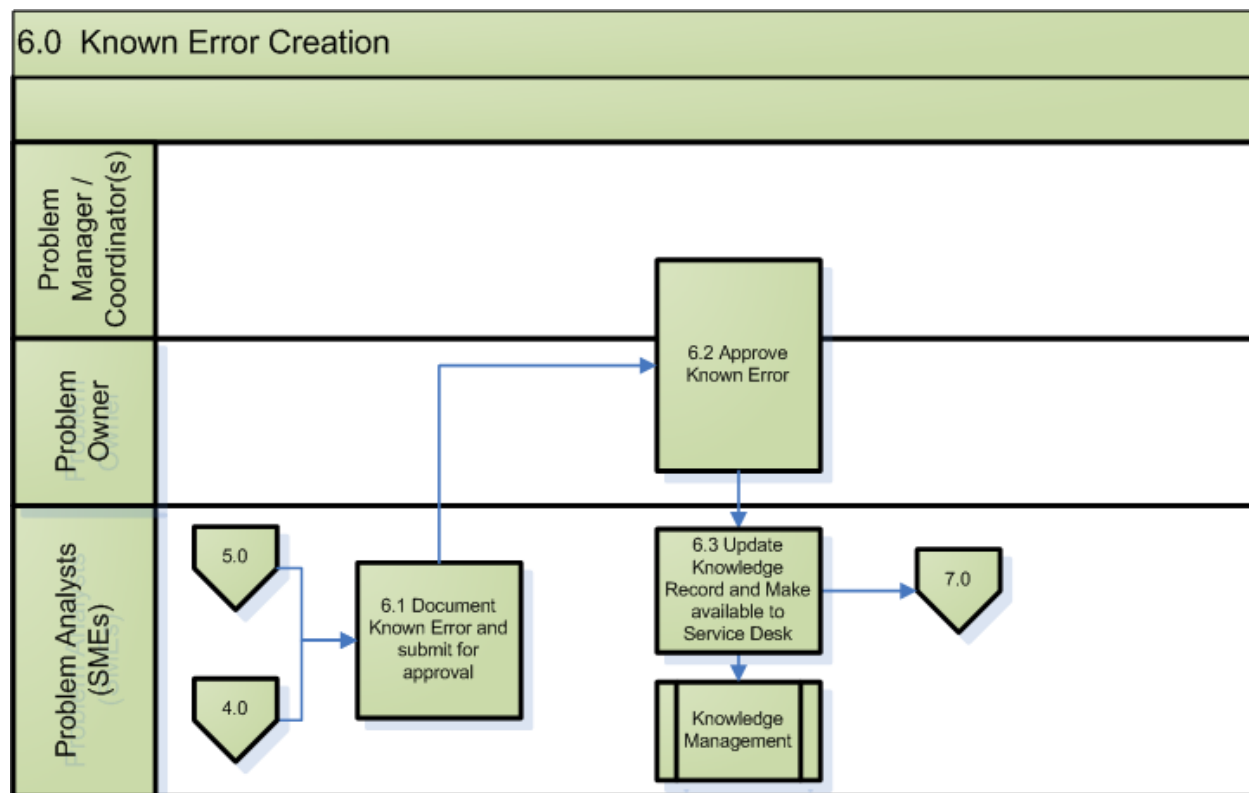
5.0 Workaround Creation



Step	Activities
5.1 Document Workaround and submit for authorization	Upon identifying a workaround, the problem resolution team documents the workaround for use by Service Desk and potentially by end users.

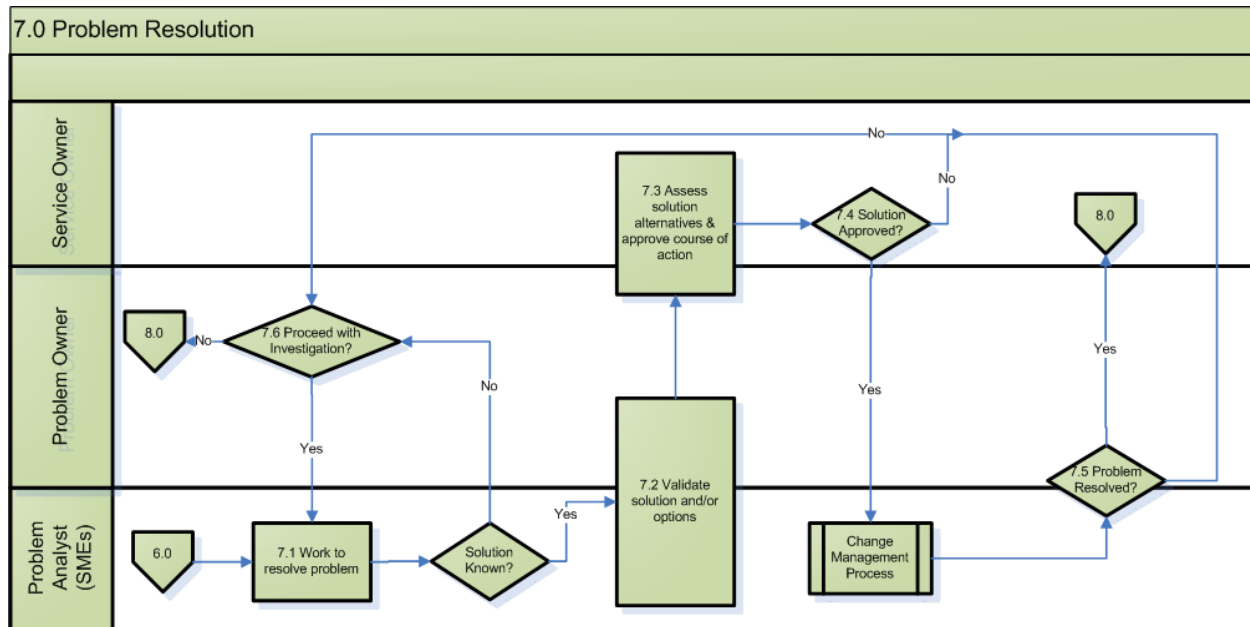
Step	Activities
5.2 Authorize Workaround	The Problem Owner, who is ultimately responsible for the resolution of the problem, authorizes the workaround.
5.3 Deploy Workaround	Upon authorization, the workaround is deployed to the appropriate levels in the organization.
5.4 Root cause known?	Although a workaround is identified, the Root cause may still not be known. If root cause is known proceed to the "Known Error Creation" step and if it isn't known, go back to the "investigation and diagnosis" step.

6.0 Known Error Creation



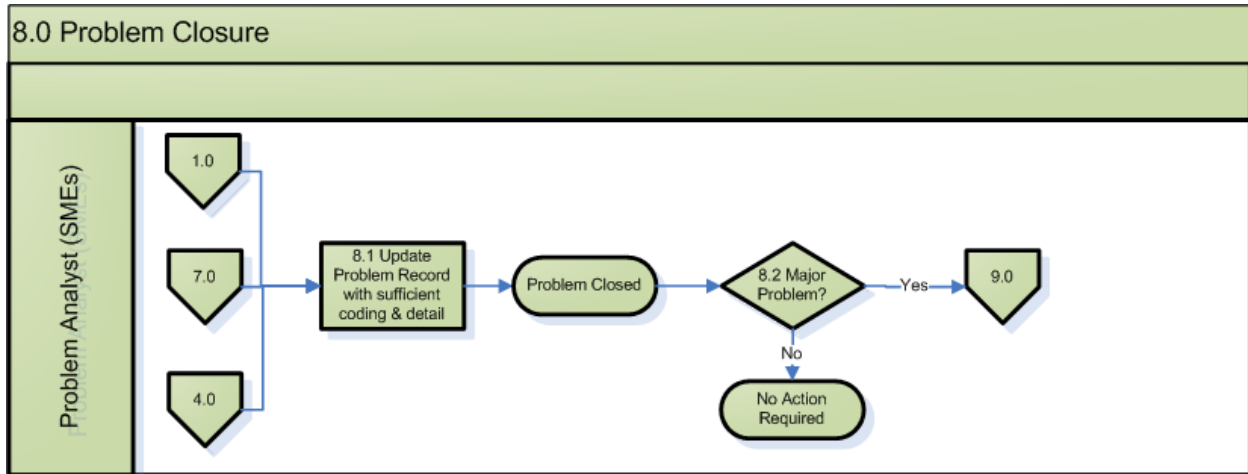
Step	Activities
6.1 Document Known Error and submit for approval	<p>Upon identifying the root cause, the problem resolution team documents the known error in assigned tasks. The problem owner reflects the consolidated root cause details in the problem record.</p> <p>It is important to note that occasionally Known errors are identified with new applications or by vendors, it is important to ensure these are recorded. This allows a mechanism to track how often these known errors are being encountered and will help to form the case towards a resolution.</p>
6.2 Approve Known Error	The Problem Owner, who is ultimately responsible for the resolution of the problem, approves the known error.
6.3 Update Knowledge Record and make available to Service Desk	Upon approval, the known error workaround is deployed to the appropriate levels in the organization.

7.0 Problem Resolution



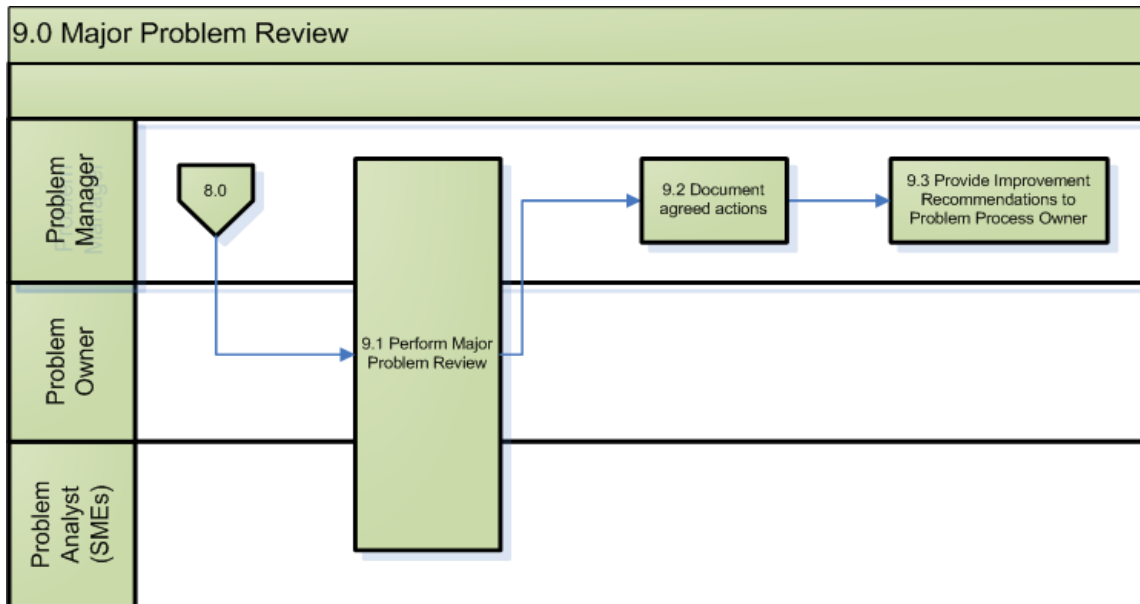
Step	Activities
7.1 Work to resolve problem	The problem resolution team works to identify temporary or permanent solutions or potentially alternatives to be considered by the Service Owner. The solution alternatives and options should be documented so the Service Owner has all the information necessary to make an information decision on the course of action.
7.2 Validate solution and/or options	The Problem Owner works with the resolution team to validate the solution options being put forward for approval.
7.3 Assess solution alternatives and approve course of action	The Problem Owner and Service Owner discuss the available options to determine the best course of action. In some cases the Service Owner may need to bring the decision to another decision-making body usually if additional funding is required.
7.4 Solution Approved	If the solution is approved, it will proceed through the Change Process. If the solution is not approved a decision is made to continue investigation to come up with an alternative solution or to discontinue efforts.
7.5 Problem Resolved?	Once the solution is implemented, the Problem Owner together with the Problem Analysts determine if the solution did in fact resolve the problem. If it did, proceed to close the problem. If it did not, a decision is made to continue investigation to come up with an alternative solution or to discontinue efforts.
7.6 Proceed with Investigation?	This decision is made by the Problem Owner in consultation with a variety of stakeholders including the Service Owner, SMEs, etc. It may be determined that the effort involved in further investigation does not out-weigh the benefit from resolving the problem. If the decision is made to NOT proceed with problem activities, it must be clearly noted in the problem record.

8.0 Problem Closure



Step	Activities
8.1 Update Problem Record with sufficient coding & detail	Once the Problem has been resolved or it has been decided that problem activities are to not continue, the problem record is closed. Note: This requires an opportunity to confirm that the problem has truly been addressed through the change, and may require an extended timeframe to validate (e.g. monthly batch processing may have to occur to be certain the change addressed the problem). Part of closing the problem record is to ensure all approvals are documented, the coding is accurate, any rationale for decisions are document.
8.2 Major Problem?	Once the problem has been officially closed, if it is a Major Problem, it requires a Major Problem Review.

9.0 Major Problem Review



Step	Activities
9.1 Perform Major Problem Review	<p>It is important to review the lifecycle of any Major Problems. Major Problems are those that have a high Priority and therefore have a large affect on the organization. The following are some items (not limited to) that are addressed in the review:</p> <ul style="list-style-type: none"> • Process adherence • Clarity of roles and responsibilities • Availability of resources to participate in problem activities • Proper supporting documentation • Follow-up actions required
9.2 Document agreed actions	<p>As part of the review a set of action items may be identified that are intended to improve service delivery and process capability.</p>
9.3 Provide Improvement recommendations to Problem Process Owner	<p>Often these reviews will identify improvements to the process. These recommended improvements are to be documented and provided to the Problem Process Owner for consideration as future enhancements to the Process.</p>

Problem Sources

Incident Management - Tier 1	• Identified by the service desk.
Incident Management - Tier 2+	• Identified by Tier 2+ resources.
Continuous Service Improvement	• Determined through service improvement activities.
Release and Deployment Management	• Acceptable known errors captured during release review.
Change Management	• The problem is likely related to an unsuccessful change.
Customer-Reported	• A functional enhancement request.
Vendor-Identified	• The problem is being managed or was reported by a vendor.
General Root Cause Request	• Typical problem manager trend analysis activities.
Problem Management	• The problem is related to a previous or inter-related problem.
Event Management	• The problem was identified through a non-impacting (i.e. no incident generated) event.
Other	• The problem was identified through some other means.

Problem Types

Level 1	Level 2	Level 3	Descriptions
Reactive	Trend	Consistent	The problem is based on a clearly identified and recurring associated incidents trend.
Reactive	Trend	Inconsistent	The problem is based on a trend of associated incidents that is inconsistent but recurring.
Reactive	One-Time	Authorized Change	The problem is related to incidents generated from a suspected authorized change.
Reactive	One-Time	Un-Authorized Change	The problem is related to incidents generated from a suspected unauthorized change.
Reactive	One-Time	Major Incident	The problem is related to a major incident where root cause analysis was requested directly or determined to be necessary in the major incident review.
Reactive	Other		The problem is related to one or more incidents that share some other characteristic(s).
Proactive	Release Pre-Deployment Known Error		The accepted known error was identified as part of release and deployment review activities. This also includes known errors identified for COTS packages (i.e. release notes).
Proactive	Event-Driven (Warning)		The problem is related to event monitoring warnings where the service has not yet been impacted from a customer's perspective.
Proactive	Other		The problem has been identified proactively through some other means.

Problem Prioritization

Unlike incident management where high impact and high urgency equals high priority, problems are focused on removing high impact and low complexity problems first. This approach provides the greatest gain to the organization for the least effort, and supports a reduction in Tier 2 firefighting activities, freeing up more time to work on more complex problems over time.

Problems often incur costs, either directly or through the assignment of critical support resources to perform diagnosis and resolution activities. In addition, there is significantly more subjectivity in the prioritization of problems vs. incidents, due to the nature of the process itself. The goal is to remove impacts to customers and thus, there are often competing factors that must be considered including cost to the business in lost revenue, technical complexity of the problem, relative impacts to customers and costs to determine root cause (direct costs such as licenses/hardware etc., or as a result of committing highly skilled, and therefore high cost resources to the problem teams).

Prioritization Matrix

Impact	N/A	N/A	N/A	N/A	N/A
	High	3	2	1	N/A
	Medium	4	3	2	N/A
	Low	5	4	3	N/A
		High	Medium	Low	N/A
		Complexity			

Impact Values

Value	Description
High	The problem is causing a high number of customer impacts, often derived through the volume and priority (e.g. high impact) of associated incidents. In addition, problems that are deemed to be incurring high expense or lost revenue would be considered high impact.
Medium	The problem is causing a some customer impacts, often derived through the volume and priority (e.g. medium impact) of associated incidents. In addition, problems that are deemed to be incurring expenses or potentially lost revenue would be considered medium impact.
Low	The problem is having a minimal impact on customers, often derived through the volume and priority (e.g. low impact) of associated incidents. No appreciable revenue lost is predicted.

Complexity Values

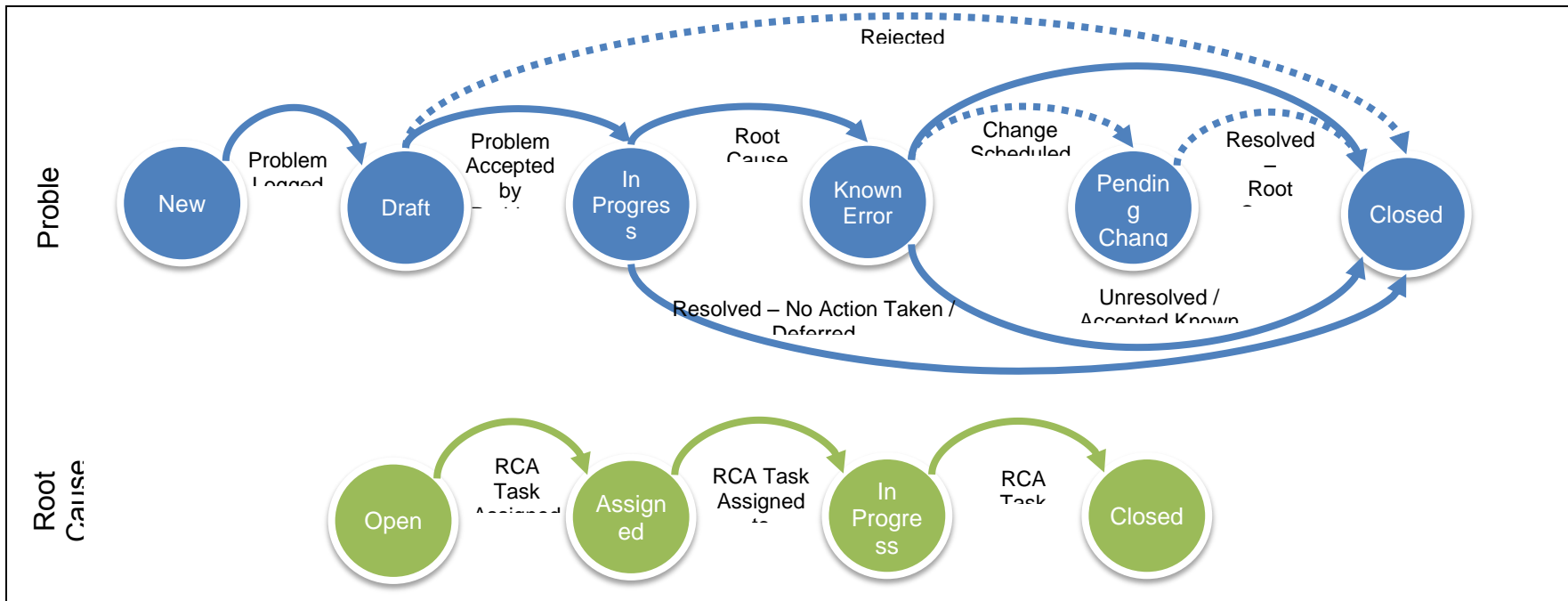
Value	Description
High	The problem is complex due to factors including very high costs and/or significant effort required by IT support staff to diagnose and/or remove the problem.
Medium	The problem presents some complexity due to a combination of cost and/or requirement to focus a large number of resources (or a select few who are critical) to diagnose and/or remove the problem.
Low	Acceptable or minimum complexity due to costs and/or resource requirements to diagnose and/or remove the problem.

Problem Closure Codes

Deferred	<ul style="list-style-type: none"> The problem was closed without root cause determination (e.g. costs are too high to diagnose, value to remove is too low etc.).
Accepted Known Error - Workaround Implemented	<ul style="list-style-type: none"> The problem will not be removed as the workaround is acceptable.
Accepted Known Error - No Workaround	<ul style="list-style-type: none"> The problem will not be removed and no workaround exists however the impacts are minimal/acceptable.
Resolved - No Action Taken	<ul style="list-style-type: none"> The problem affects stopped and during an accepted monitoring period the problem did not resurface.
Resolved - Root Cause Removed	<ul style="list-style-type: none"> The most common closure code, indicating that a change was successfully implemented to remove the problem.
Unresolved – Rejected	<ul style="list-style-type: none"> The criteria required to accepted a problem were never met and the problem has been rejected by the problem manager.
Unresolved – Cost	<ul style="list-style-type: none"> Used when a feature request has been raised, but the cost of the request is too high to action and acceptable to the business/customer (payer).
Unresolved - Future Release	<ul style="list-style-type: none"> The feature request was already defined for a future release. Unresolved problem may be associated to an originating problem for the initial request.

Problem States

A state model allows for the capture of key process milestones. Each milestone represents an important point in time within the process that needs to be captured, often for performance measurement purposes.



Process Metrics

The following table describes the Process KPIs identified.

Yale KPI	Fruition Partners Operational Measure / Notes
Ref #:4 % Repeat Incidents	Consider replacing with Incident to Problem Ratio?
Ref #:5 Variation in problems logged	N/A - Quickbase calculated? Future consideration to report on process consistency / QA / Audit
Ref #:9 % of problems not resolved within SLA targets	Recommend against SLA reporting for PM
Ref #:11 % problems reopened	Problems are not reopened – they are only resolved with problem removal is confirmed
Ref #:12 % of problems with customer Impact	Problems associated to incidents / Incident to Problem Ratio? (Exclude incidents resolved with workarounds)
Ref #:14 % Problems responded on time	Recommend against SLA reporting for PM
Ref #:15 % Problems resolved on time	Recommend against SLA reporting for PM
Ref #:16 Cost of solving a problem	Cost to resolve captured – calculate in QuickBase?
Ref #:6 % of problems resolved	Problem Resolution Rate
Ref #:7 Average problem resolution time	Mean time to close problem
Ref #:8 % of problems unresolved	Volume of problems not in resolved state
Ref #:10 % of problems not linked to Known Errors records	Volume of problems with Known Error Flag
Ref #:13 % Ageing problems	Volume of undiagnosed (i.e. no known error) problems – backlog
Ref #:17 Total number of problems caused due to unauthorized changes	Volume of problems by Incident Source = unauthorized change
Ref #:18 Problems not associated with incidents	Volume of problems with no associated incidents
Proposed	Mean time to known error identification
Proposed	Mean time to Workaround Deployment
Proposed	Volume of undiagnosed problems
Proposed	% Problems with Workarounds Published to KMDB

Document History

Version	Date	Changes	Author
01	02/03/2012	Initial Document	Angie Massicotte / Michael Oas
02	02/04/2012	Minor Updates	Michael Oas