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**SECTION G5  
TEAM 7**

**SMART CONTRACT PRODUCT (SCP)**

**PROBLEM MANAGEMENT PLAN**

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# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Version | Description | Author |
| 16-3-2019 | 1.0 | Initial write-up | Kenny Kwek, Ong De Lin, Janell Lee, Mark Tan, Lau Jun Rong |
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## 

# Introduction

## Purpose

The purpose of this document is to provide a general overview of the Problem Management Process. It includes Problem Management goals, objectives, scope, benefits, key terms, roles, responsibilities, authority, process diagrams and associated activity descriptions. This document is developed based on the ITIL framework.

As such, the Problem Management process manages the lifecycle of all problems, of which a problem is defined as the unknown cause of the same incident occurring many times.

The scope of this Problem Management Process would then include any unresolved incidents with no known root cause.

## Goals

The main goal of Problem Management include minimizing both the frequency and impact to the business of incidents that are caused by errors within the infrastructure.

The goals for the Problem Management process also include:

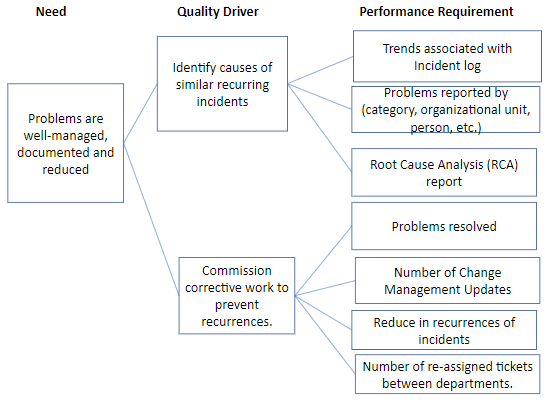
* Detect problems before users are affected
* Identify causes of similar recurring incidents
* Provide the relevant Workarounds for potential future recurrences
* Prevent repeated incidents by addressing their underlying causes
* Minimize impacts of unpreventable incidents

## Types of Problem Management

Problem Management processes are both reactive and proactive.

1. **Reactive** Problem Management is the problem solving reaction that occurs when one or more incidents arise and the Support team proceeds to find a workaround as well as a permanent resolution.
2. **Proactive** Problem Management deals with identifying and solving Problems before any Incidents have occurred.

## Critical-to-Quality (CTQs) & Key Performance Indicators (KPIs)



# Roles and Responsibilities

## IT Operations Manager & Quality Assurance

IT Operations Manager & Quality Assurance are the owners of the Problem Management process. They are responsible for all aspects of its coordination.

The role includes responsibility for:

* Acting as the liaison with personnel responsible for Problem resolution
* Ensuring Problems are resolved
* Ownership and management of the Known Error Database (KEDB)
* Closure of Problems
* Coordinating major Problem review

## Support Manager, Tier 1 - Communication, Tier 2 - Business Analyst, Tier 3 - Dev and Infrastructure & Security

Solving Problems may be handled by internal technical support team members. In situations where a serious or major Problem occurs, the IT Operations Manager & Quality Assurance may formulate a dedicated Problem Management team that is made up of resources with specific expertise.

# Problem Management Process Activity

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## Problem Detection

Other than problems that are raised in response to incidents by Tier 1, the IT Operation Manager and Quality Assurance will perform an Incident Request Review at regularly scheduled intervals. During the review, they will analyze the incident request information to identify the problems with the services they are responsible for. As such, all personnel who have the right to raise a problem will be termed Problem Reporters.

## Problem Logging

Upon recognizing that a problem exists, a problem record will be created to contain all the relevant information and the problem records will be linked with the associated incident reports. Additionally, the details from the incident report that is to be included in the problem record will include when the incident was reported and who reported it, the service affected, a description of the incident and the actions taken, the incident report number and the incident priority and category.

However, it is important to note that the incident itself must continue to be managed to resolution whether the problem is resolved or not.

## Problem Categorization

Problems will be categorized in the same way as incidents based on the same categorization scheme to maintain consistency and more clarity in determining a trend.

## Problem Prioritization

Similarly, the priority of a problem will also be determined based on the Incident Matrix based on impact and urgency that is used to determine the priority of an incident.

Aside from the impact and urgency, the frequency of occurrence is also considered by the IT Operation Manager and Quality Assurance during the Incident Request Review with the main consideration of the impact to the business.

## Initiate the problem investigation

If a problem investigation already exists for an incident request, the IT Operation Manager and Quality Assurance relate that incident request to the existing problem investigation. When a new problem is identified, the IT Operation Manager and Quality Assurance will initiate a problem investigation and relate it to the corresponding incident requests. Afterwards, they will assign the task to the specialists (Tier 2 - Business Analyst, Tier 3 - Dev and Infrastructure & Security) to perform a root cause analysis.

Problem investigations can also be triggered by other members of the team. For example, Tier 1 (Communication) can initiate a problem investigation if they think that an incident request was caused by an underlying problem.

## Identifying a Workaround

When a problem investigation is assigned to a specialist for root cause analysis, the specialist looks for a temporary workaround to restore the affected service. If the specialist develops a workaround, they provide information on the workaround to Tier 1 so that the incidents can be resolved by Tier 1. This helps Tier 1 resolve future incidents caused by the problem until a permanent or structural solution is implemented. As such, the problem record still remains open and the details of the workaround is to be documented in the problem record.

## Root-Cause Analysis (RCA) and Known Error Record

Next, the specialist looks for the root cause of the problem. The specialist will also create a known error record related to the problem investigation and store it in the known error database (KEDB). If the specialist finds a root cause, they update the problem investigation with information about the root cause, workaround, and resolution.

Thus, information about all known errors and which problem record the known errors relate to is kept in the KEDB for the convenience of the support team when repeat incidents occur.

Regardless of whether a structural solution is proposed or implemented, the specialist informs the IT Operations Manager and Quality Assurance when the root cause analysis is completed.

## Identify changes

If the specialist thinks that a change is required to remove the root cause or to enable a workaround, they will need to inform the IT Operations Manager and Quality Assurance. Otherwise, the specialist implements the preferred structural solution.

In the case whereby the specialist cannot find the root cause or cannot propose a structural solution, the specialist adds the reason to the problem record.

## Close or reassign problem investigations

After the root cause analysis is completed, the IT Operations Manager and Quality Assurance reviews the analysis. If they are unsatisfied with the root cause analysis, they can reassign the problem investigation for further analysis. If the problem is resolved, the IT Operations Manager and Quality Assurance close the problem investigation. During closure, the IT Operations Manager and Quality Assurance perform a final assessment of the problem investigation. If the IT Operations Manager and Quality Assurance are satisfied that the root cause of the problem has been permanently removed, they will close the problem investigation. If the root cause analysis concluded that no permanent workaround or solution to the root cause exists, and the IT Operations Manager and Quality Assurance agrees, they will indicate that the problem investigation is on hold. This indication leaves the investigation open for periodic review in the event that an appropriate solution becomes available in the future. If, however, the resolution did not remove the root cause, or if the IT Operations Manager and Quality Assurance think that an appropriate solution is available, they can reassign the problem investigation for further analysis.

The IT Operations Manager and Quality Assurance also close the investigation if the specialist performed a sound analysis but could not propose a structural solution. If the specialist did propose a structural solution but did not implement it because the specialist believes that a change is required, the IT Operations Manager and Quality Assurance must confirm that the change is required. If a change is required, the IT Operations Manager and Quality Assurance will generate a known error and will inform COO and Product Manager if necessary. This action will start the Change Management process. Later, after the change is implemented, the problem investigation will be closed.

# Possible Problem Areas

|  |  |  |
| --- | --- | --- |
| **Area** | **Description** | **Solutions** |
| Hardware | Port down | Restart port |
| Software | Unexpected behaviour /bugs | Patch the code |

# RCA Methods

Though there are several Root Cause Analysis methods, our team has decided to start with the Timeline Analysis to understand the situation and identify all the information that is available.

## Timeline Analysis

Conducting a Timeline Analysis helps the team to investigate an incident or problem by providing a visual story of the situation. Thus, the team has decided to employ the Timeline Analysis in the following order:

1. Get all data from multiple sources for everything that happened
2. Sort the data by date and time, regardless of where it came from.
3. List the events chronologically
4. Look for patterns

The solving team will analyze the timeline of the incident to gather as much information as they can. This will provide the team with a better understanding of the situation and the information will be used to complement the Fishbone diagram to explore the possible root causes.

## Ishikawa Fishbone Diagram with the 5 Whys Analysis

The team will use these two methods to explore the different possible root causes with the use of 5 Whys analysis. The team is required to brainstorm at least four causes that contribute to the incident. They will then analyze and breakdown each cause into different possible reasons using the 5 Whys. This step will be repeated continuously until the root causes have been identified.