Key Aspects for a Mature IT Problem Management Process

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Abstract: **This article gives key aspects that are recommended to be followed to elevate the maturity level of IT Problem Management Process. This includes the use of an integrated system, the focus on proactive problem management, and the establishment of well-defined KPIs. The article explains those aspects in details.**

Keywords: **IT Problem Management, IT Service Management, ITIL, KPI, CSF, Best Practices.**

I. INTRODUCTION

The purpose of IT Problem Management process is to manage the lifecycle of problems from first identification to resolution. It aims to prevent incidents caused by errors within the IT infrastructure from happening or to minimize the impact of incidents that cannot be prevented. IT Problem Management is a key catalyst for increasing the quality and availability of IT Services.

Problem Management process delivers the following values to the business:

- Higher availability of IT services

- Higher productivity of business and IT staff

- Lower expenditure on workarounds and fixes that do not work

- Lower cost of efforts in fire-fighting or resolving repeated incidents [1]

ITIL provides a general framework to follow when operating IT Problem Management process as well as other IT Service Management processes. However, from personal experience gained through running IT Problem Management process for over a decade in a large enterprise, there are a few aspects that were found to be keys to successfully elevate the maturity level of the process. This includes the use of an integrated system, the focus on proactive Problem Management, the establishment of well-defined KPIs, and the level of commitment, skillset, and investigation cooperation of the involved IT staffs. The following sections of the article explain those aspects in details.

II. INTEGRATED SYSTEM OF RELATED IT PROCESSES

There are many factors to consider when evaluating Problem Management software solutions. The most important feature is to cover the basics of Problem Management lifecycle to create, categorize, investigate, edit, resolve, and close problem records. Other important features include date/time tracking of the investigation and resolution, reporting and Key Performance Indicators (KPIs), as well as the availability of a Knowledge Management Database (KMDB). A very key factor that tends to be missed, is the integration with other IT Service Management (ITSM) processes.

IT Problem Management process is very interrelated to the Incident Management process. In fact, people usually mix between the two processes. To clear the difference, "an incident is an unplanned interruption to an IT service or reduction in the quality of an IT Service. A problem presents a different view of an incident by understanding its underlying cause, which may also be the cause of other incidents." [1] While the Incident Management process is focused on restoring the

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service, the Problem Management process is focused on preventing incidents from recurrence. Major incidents are usually the trigger of reactive Problem Management; and repetitive incidents are the main input to trigger proactive problem management's trend analysis. Therefore, it's highly recommended to have both Incident and Problem Management processes integrated within the same system, to better streamline the two processes. It helps to relate a problem to associated incidents, and identify if certain incidents are related to an on-going problem. In addition, it simplifies the proactive trend analysis, which relies on the incident data.

Change Management process is also connected to Problem Management. Failed changes require root cause investigation by Problem Management, if the root cause could not be identified as part of the Change Management post implementation review process. In addition, problem resolutions and workarounds require a Request for Change (RFC) to be implemented. The RFC is governed and tracked by the Change Management process. Having both, Problem and Change Management processes integrated within the same system, provides Problem Management with a better visibility on related RFCs, and streamline the two processes.

Asset/Configuration Management process also plays an important role in IT Problem Management process. Problem Management uses the Configuration Management System (CMS) to determine affected configuration items (CIs) as well as to assess the impact of a problem. An integrated system for Asset/Configuration Management and Problem Management allows a long-term tracking of all CIs and the problems related to them. It helps to identify if a specific component has repetitive failures, or a problem requires implementing a fix proactively on similar components.

It's not required for ITSM processes to use the same system, however having them integrated, elevates the maturity level of the processes. There are many ITSM tools that provide integration in the market. Examples include Service Now, SolarWinds Service Desk, HaloITSM, BMC Remedy, ServiceDesk Plus, and SysAid. It's worth to keep in mind features like automation, self-service, and customization capabilities when looking for an integrated tool. [2]

III. FOCUS ON PROACTIVE PROBLEM MANAGEMENT

Problem Management process has two aspects: Reactive & Proactive. "Reactive Problem Management is concerned with solving problems in response to one or more incidents. Proactive Problem Management is concerned with identifying and solving problems and known errors before further incidents related to them can occur again." [1] While Reactive Problem Management is considered the foundation level of implementing the process, Proactive Problem Management is what elevates the maturity level of the process. Proactive Problem Management includes ongoing service improvement activities that requires trend and data analysis. It aims to improve the quality and availability of IT services, which leads to a better user experience and a higher customer satisfaction.

A variety of methodologies can be used in Proactive Problem Management and Process Improvement. These include Lean Six Sigma, Agile Management, and Total Quality Management. Organizations should evaluate the methodology that fits their needs the best. In general, all the process improvement tools share many common features. They adopt the idea that all processes can be improved and that measurement and statistics are the key to improvement., but Lean Six Sigma "is proving to be the best approach developed yet. It adds more tools, looks at more situations, and achieves results faster." [3] Lean Six Sigma uses DMAIC approach for service improvement. It's a 5-phace process, which includes Define, Measure, Analyze, Improve, and Control. The Define phase identifies the service or product to be improved, the Measure phase determines the magnitude of the problem, the Analyze phase identifies the possible causes of the problem, the Improve phase defines the solutions to the problem, and the Control phase helps to maintain the implemented improvement [4]

Data analysis/mining is a time-consuming effort, and there are many data analysis/mining tools in the market to automate the process, or at least part of it. RapidMiner is considered one of the best data analytics solutions. Other recommended tools include Tableau, Looker, Microsoft Power BI [5]. In addition, Microsoft Excel has powerful capabilities that are usually underestimated, due to lack of training. "A wide range of functionalities accompany Excel, from arranging to manipulating, calculating and evaluating quantitative data to building complex equations and using pivot tables, conditional formatting, adding multiple rows and creating charts and graphs – Excel has definitely earned its place in traditional data management." [6]

IV.   USE OF APPROPRIATE KEY PERFORMANCE INDICATORS (KPIS)

Establishment of KPIs should not be a random process. "Each organization should develop KPIs that are appropriate for its level of maturity, its Critical Success Factors (CFSs) and its particular circumstances" [1]. In addition, a study of best practices provided by IT Service Management frameworks should be conducted to build knowledge of CSFs and KPIs that suit the organization. Furthermore, benchmarking with similar organizations, would also help identify comparable measures and KPIs. After the definition of suitable KPIs, comes setting-up the right targets that are both challengeable and achievable. This can be achieved by conducting a study on the historical data of the process, as applicable. Finally, KPI results should be monitored and evaluated on regular basis, in order to identify continuous improvement opportunities.

After running IT Problem Management process for several years, and searching for the best KPIs in the market as well as conducting a benchmarking study with competitive oil and gas companies through the Oil & Gas Benchmarking Group (OGBG), following are three recommended KPIs for a mature process. First, percentage of problem records closed with identified root cause. This KPI measures the efficiency of the Problem Management process in closing problem cases, with an identified root cause. Identifying the root cause of problems is one of the main goals of IT Problem Management, that will ensure a proper solution is in place, and lead to eliminating or minimizing future recurrence. The Second KPI is the percentage of on-time root cause investigations. This KPI measures the compliance of the root cause investigation for problem records with preset SLAs. In many cases, taking a long time to investigate the root cause of the problem, would lead to missing system logs, which makes it harder to investigate. Identifying the root cause on time, increases the reliability of the Problem Management process. The Third KPI is the percentage of on-time problem resolution. This KPI also measures the compliance of the resolution implementation of problem records. Ensuring a proper solution is implemented will save time, effort, as well as cost of future recurrence. In addition, it helps to maintain business confidence in IT capabilities. A definition of what is considered "on-time" should be setup based on operation and type of problems faced.

The more mature the Problem Management process gets, the more details can be captured and measured. KPIs can be cascaded by department level, where each department can measure its performance separately. In addition, KPIs can be sub-divided by problems that require vendor involvement and problems that do not, as vendor involvement usually require more time to investigate and resolve. They can also be segregated by problem type; for example, resolving a network outage would take a different time than resolving a server or an application failure. It's always a good practice to record as much details as possible of a problem record, as some information can depict a certain trend, which could be used in setting up a new KPI at a later stage.

V.   IT STAFFS' COMMITMENT, SKILLSET, AND INVESTIGATION COOPERATION

One of the critical success factors (CSFs) of the Problem Management process is to "provide overall quality and professionalism of problem handling activities to maintain business confidence in IT capabilities" [1]. Such CSF heavily depends on human factor, where involved IT Subject Matter Experts (SMEs), including Problem Managers, need to be fully committed, having the right skillsets, and are willing to fully cooperate during problem investigations.

In a large enterprise, the IT Organization is usually large in size, which comprises multiple departments, such as Network, Application, Computing, Information Protection, IT Engineering, etc. Such formation causes silos to exist between the departments, and leads such departments to be independent of each others, which does not help during problem investigations, as it breaks the one-team spirit. In fact, in many cases, SMEs who get assigned from various departments to investigate a problem's root cause, their main concern during root cause investigations, is to prove that the problem is not related to their technical domain, which hinders the problem's root cause investigation and slows down its resolution. Unfortunately, such practice increases silo, and introduces unwanted politics.

Moreover, we found in many scenarios that some of the IT SMEs, lack necessary skillsets and trainings that are necessary to investigate problem root causes, where such cases start bouncing between the IT teams, and later end up getting transferred to the relevant vendors for further analysis, and thereby delay resolution. In fact, after repeatedly escalating such issues to management level, some cases get closed without identifying their root causes, thereby introducing a great risk for failure of IT services to potentially reoccur again.

On the other hand, the centralized Problem Management team, in-charge of governing the process, must possess a strong appetite and willingness to continuously/aggressively pursue problem root cause investigation and resolution, without any external influence or pressure. Therefore, it is highly recommended that such governing process must report directly to the CIO office. Not only Problem Management, but other important governing processes, such as Change Management, Asset Management, etc. should also report to directly to the CIO, to maximize their governing power, and ensure neutrality.

VI.   CONCLUSION

Maturity is a long journey process. The more the Problem Management process is operated, the more well-defined it will be. The more integrated the system is used, the more the process will be mapped with other related processes. The more well-established KPIs are managed, the more improvement opportunities will be identified. And the more enhancements are implemented, the more mature the process gets.

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