ITIL v3 Problem Management Process

...root cause analysis
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Key definitions

**Problem**
The unknown cause of one or more incidents.

**Problem Record**
A record containing the details of a lifecycle of a single Problem.

**Known Error**
A Problem that has a documented Root Cause and a Workaround. Known Errors are created and managed throughout their Lifecycle by Problem Management.

**Known Error Database (KEDB)**
A database containing all known Error Records. It is created by Problem Management. KEDB is a part of the Service Knowledge Management System (SKMS).

**Problem Management**
The process responsible for managing the lifecycle of all problems. Includes activities required to diagnose the root cause of incidents, determine the resolution to those problems and it’s implemented through the appropriate control procedures, especially Change and Release Management.
Problem Management is forensics!
Purpose and objectives

Purpose

...identifies once and for all the root causes of problems.
...helps minimise the effects as well as preventing potential problems occurring in the future

...thereby attempting to minimise incidents and their causes

Objectives

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

• Also...maintain information about problems, workarounds and resolutions - strong interface with Knowledge Management
Opening a Problem- scenarios...

Incidents → Criteria → Problems

Critical / High Priority
Incidents with
Extensive Impact and potential
To re-occur

Critical Problem

Independent Incidents
With significant
Impact and possible
same root cause

High Priority Problem

Multiple moderate
incidents possible
Same cause or multiple
Causes.

Medium Priority
Separated Problems

Data analysis of incident
Records to determine
Process, system, or
Network issues

Determine
Problem Management
Inclusion.

Trend analysis to determine
issues

Determine
Problem Management
Inclusion.

While the incident record is open or after it has been resolved it is reviewed for problem management inclusion. If the incident (or group of related incidents) meet the criteria, a problem record is created to identify cause, solution, and control to prevent re-occurrence.
Problem Management

Scope

• Diagnosing the root cause of incidents and determining the resolution to problems.

• Ensuring that the resolution is implemented through the appropriate control procedures, especially Change Management and Release Management.

• Maintaining information about problems and the appropriate workarounds and resolutions, ...

... strong interface with Knowledge Management, and tools such as the Known Error Database will be used for both.

• Close integration with Incident Management ... same tools, and may use similar categorization, impact and priority coding systems. This will ensure effective communication when dealing with related incidents and problems.)
Value to business

Problem Management with Incident and Change Management...

- increase of IT service availability and quality
- less downtime and less disruption to business critical systems
- Known Error information reduce incident resolution times

Additional value....

- Higher availability of IT Services
- Higher productivity of business and IT staff
- Reduced expenditure on workarounds or fixes that do not work
- Reduction in cost of effort in fire-fighting (or resolving repeating incidents.)
Problem Management

Problem models

Pre-defined steps of handling problems in an agreed way.

- Problem Models may deal with the problem and any associated recurring incidents
- Creating a Problem model is an additional step building up from only creating a Known Error Record in the Known Error Database.

Problem Model should include the following:
- steps required to handle the incident and their order
- Responsibilities
- Timescales and thresholds for completion
- Any escalation procedure
- Any evidence prevention activities
Problem Management

Reactive and Proactive Problem Management

**Reactive PM**

Identifying problems, and finding an immediate workaround to allow the smooth continuation of business until the permanent resolution is implemented by Change Management.

Goal: To resolve problems quickly, effectively and permanently

**Proactive PM**

- forward-looking approach
- ongoing and methodical process
- using analysis of problem trends and statistics
- Preventive actions

Goal: To prevent/minimise issues occurring,

‘Prioritising in **pain factor order**’

Prioritise resources for the Problem according to the seriousness of the impact on the business.

Change Management
Process flow
Detection & Logging:
- Once a problem is detected all relevant details must be logged:
  - Problem unique ID
  - Date/time stamp
  - Reference to related Incidents, Known Errors, Cis...
  - Reference to RFCs

*Frequent and regular analysis of incident and problem records must be performed to identify trends*
Problem Management

Process flow – Categorization and Prioritization

- **Categorisation**: used mainly to determine an appropriate allocation of resources (often an extension of the Incident categorisation)

- **Prioritization**:  
  - Priority also consists of impact and urgency factors  
  - Priority also takes into consideration severity:
    - Can the system be recovered or needs to be replaced?  
    - How much will it cost?  
    - How much effort is needed to fix the problem?  
    - How long will it take?  
    - How many impacted CIS?
Problem Management

Process flow – Investigation & Diagnosis

Investigation & Diagnosis: Finding Root Cause of the problem

CMS will be used to determine the level of impact and incidents related

* These two stages are complex, and require a good technical knowledge, supported by problem-solving and diagnostic skills.
Problem Management

Process flow – Workaround, Known Error

Applying Workarounds:
- Workaround is a temporary resolution to an incident

Raising a Known Error Record:
- If there is a workaround:
  - Work on finding a permanent solution should continue (where justified)
  - The problem record should be open until permanent solution is found or if finding one has not been justified

- Documented in the Known Error Database

* Known Error Record will be raised as soon as a workaround or a permanent fix has been found (possibly even sooner)
Problem Resolution:

- Permanent resolution should be applied as soon as possible *(ideally)*...

- In many cases in order to apply the resolution RFC will be raised and transferred to Change Management for approval

* Until the permanent solution is in place Known Error Database will help in resolving any new occurrences
Problem Closure:

1. The resolution has been applied
2. Quality of information in the Problem Record has been checked
3. The status of any associated Kes has been updated
4. All related incidents have been closed

* User satisfaction must be checked
Process flow – Major Problem Review

Major Problem Review:
• Major Problem Review will examine:
  • Things that were done correctly
  • Things done wrong
  • Things that could be done better in the future
  • How to prevent recurrence
  • If follow up action is required after third party involvement
  • Knowledge learned will be shared with customers at Service Review Meetings

* Follow up actions are the normal part of Continual Service Improvement
Problem Records can be triggered:

- ...in reaction to one or more incidents, and many will be raised or initiated via Service Desk staff.

- ...in testing, particularly the latter stages of testing such as User Acceptance Testing/Trials (UAT), if a decision is made to go ahead with a release even though some faults are known.

- ...by Suppliers; through the notification of potential faults or known deficiencies in their products or services.
Problem Management

Process Interfaces

Incident Management
- Incidents (repeated) often point to problems
- Solving the problems should reduce the number of incidents

Change Management
- PM ensures that all resolutions or workarounds that require a change to a CI are submitted through Change Management through an RFC.
- Change Management will monitor the progress changes and keep PM advised.
- PM is involved in rectifying the situation caused by failed changes.

Asset & Configuration Mgmt
- PM uses the CMS to identify faulty CIs and also to determine the impact of problems and resolutions.
- The CMS can also be used to form the basis for the KEDB and hold or integrate with the Problem Records.

Release and Deployment Mgmt
- RADM is responsible for rolling problem fixes out into the live environment.
- RADM assists in ensuring that known errors are transferred from the development KEDB into the live KEDB.
- PM will assist in resolving problems caused by faults during the release process.
Process Interfaces – cont.

Availability Management

- AM has a close relationship with Problem Management, especially the proactive areas.

Capacity Management

- Some problems will require investigation by Capacity Mgmt teams and techniques, e.g. performance issues.
- Capacity Mgmt will assist in assessing proactive measures.

IT Service Continuity Management

- where a significant problem is not resolved before it starts to have a major impact on the business, PM acts as an entry point into ITSCM

Service Level Management

- Problem Management contributes to improvements in service levels,
- SLM also provides parameters within which Problem Management works,

Financial Management for IT Services

- FM Assists in assessing the impact of proposed resolutions or workarounds, as well as Pain Value Analysis.
- PM provides management information about the cost of resolving and preventing problems
Involvement in Information Management

Problem Record
- Reference Number
- CI Impacted
- Dates and Times
- Originator
- Symptoms
- Category, Priority
- Actions Taken
- Relationships
- Closure details
A major dependency for Problem Management is the establishment of an effective Incident Management process and tools.

This implies the following:

- Linking Incident and Problem Management tools
- Ability to relate Incident and Problem Records
- Good working relationship between the different levels of support
- All staff working on problem resolution fully understanding business impact
- Ability to use all Knowledge and Configuration Management resources available.
- Ongoing training of technical staff
Critical Success Factors (CSF) & Key performance Indicators (KPI)

- **CSF Minimize the impact to the business of incidents that cannot be prevented**
  - **KPI** The number of known errors added to the KEDB
  - **KPI** The percentage accuracy of the KEDB (from audits of the database)
  - **KPI** Average incident resolution time for those incidents linked to problem records

- **CSF Maintain quality of IT services through elimination of recurring incidents**
  - **KPI** Total numbers of problems (as a control measure)
  - **KPI** Size of current problem backlog for each IT service
  - **KPI** Number of repeat incidents for each IT service

- **CSF Provide overall quality and professionalism of problem handling activities to maintain business confidence in IT capabilities**
  - **KPI** The number of major problems (opened and closed and backlog)
  - **KPI** The percentage of major problem reviews successfully performed
  - **KPI** The percentage of major problem reviews completed successfully and on time
  - **KPI** Number and percentage of problems incorrectly assigned
  - **KPI** Number and percentage of problems incorrectly categorized
  - **KPI** The backlog of outstanding problems and the trend (static, reducing or increasing?)
  - **KPI** Number and percentage of problems that exceeded their target resolution times
  - **KPI** Percentage of problems resolved within SLA targets (and the percentage that are not!)
  - **KPI** Average cost per problem.
Roles

**PM Process Owner** - accountable for the process

- Liaison with all problem resolution groups to resolve problems within SLA targets
- Ownership and protection of the KEDB
- Gatekeeper for the inclusion of all Known Errors and management of search algorithms

**Problem Manager**

- Formal closure of all Problem Records
- Liaison with third parties to ensure they fulfil their contractual obligations, especially with regard to resolving problems and providing problem-related information and data
- Arranging, running, documenting and all follow-up activities relating to Major Problem Reviews.

**Problem solving groups**

- Technical support groups and/or suppliers or support contractors, working on problems
  - under the coordination of the Problem Manager.
THE END

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