Problem Management
A Practical Guide

JIM BOLTON AND BUFF SCOTT III

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About this guide

Who's it for?

One of the challenges in writing this guide was determining the target audience of readers. The smallest IT organization that we have worked with to successfully implement problem management had an entire staff of six people, including the CIO. We recall asking the CIO how they could expect to perform problem management with an IT staff of six. Their response was sincere, and should inspire us all: 'On Friday afternoons, if there are no major issues, we will stop doing reactive incident management and focus for the next four hours as a team to identify the root cause and resolve our top problem for the week.' If an IT organization of six can do problem management, then this title is for everyone. Small organizations will find guidance on initiating their problem management process, while large organizations will discover numerous ideas that may be quickly applied to elevate their problem management process maturity to levels 3 to 4 and higher on the Capability Maturity Model Integration (CMMI) process maturity scale.

This title is intended for those who wish to gain a working knowledge of industry best practices related to problem management. It is ideal for IT professionals who are working, or plan to work, within problem management, whether in a technical, managerial or operational role.

Why do you need it?

This publication serves as the definitive resource for individuals and organizations looking to establish and mature the problem management process within their organization. It consolidates concepts and principles found across numerous IT service management (ITSM) frameworks, then adds the collective experiences of industry experts into an easy-to-read, practical and insightful guide. The bonus materials in the appendices provide templates, workflows and tools that can be leveraged by the reader to accelerate the maturity of their problem management process.

Problem Management: A Practical Guide is fully aligned with and serves as an expanded resource for the Problem Management Professional certification course offered by HDI®.

Who's it by?

Jim Bolton

Jim has more than a decade of experience in designing and delivering ITSM solutions. He is the founder and president of Propoint Solutions, Inc. (www.propointsolutions.com), an ITIL® training and ITSM process consulting organization. Jim is an expert at diagnosing and

solving complex organizational and process challenges. Jim is an ITSM consultant, courseware developer, trainer, author and speaker at conferences around the world on ITSM topics. He received the IT Industry Legend award in 2014.

Jim's credentials include an MBA in technology management, ITIL v2 Manager, ITIL v3 Expert, ITIL Practitioner and Competency certificates and the *it*SMF ISO/IEC 20000 Consultant certificate.

Buff Scott III

Buff has more than 35 years of information technology experience, ranging from a technical programmer to an IT assistant vice-president of a large Fortune 500 company. He is a seasoned IT professional whose experience includes leading technical, operational, compliance, and process design and implementation teams. He has presented at numerous local and national ITSM conferences and forums and was the master of ceremonies at the 2006 *it*SMF-USA national conference.

Buff holds a BA in business administration and the ITIL v2 Manager, the ITIL v3 Expert and Certified Information Systems Auditor (CISA) certifications. He is an EXIN-accredited ITIL trainer, TIPA lead assessor for ITIL and the lead subject matter expert and instructor on the HDI Problem Management Professional certification course.

How is it organized?

As the title suggests, this is a practical guide to IT problem management, with an emphasis on providing ITSM and industry best practices and guidance. Examples, figures and tables, including personal examples based on Jim Bolton's experiences, are used throughout to illustrate the most important points, concepts and principles.

Designed to be read from start to finish, the text is organized into seven chapters, with the first two chapters setting the context for problem management as an ITSM process, and explaining problem management's interdependent relationship with incident management. Once the big picture has been explained, the subsequent chapters delve deeper into problem management activities; its relationship to other ITSM processes; and how to organize for, and measure, your problem management process.

The publication ends with several appendices that provide real-life examples of process artefacts that can be used in the design and implementation of a problem management process. A summary of what is covered in each chapter is as follows:

● **Chapter 1** Provides an introduction to IT service management and problem management as an ITSM process, and defines terms and definitions that will be used throughout the remainder of the text.

- **Chapter 2** Shows the relationship and interdependency between incident and problem management as service resolution and restoration processes. Their similarities and differences are explained as well as their common goals, objectives and activities.

- **Chapter 3** Explains in detail the major activities and tasks associated with problem management. It considers how problem management activities are performed and explores seven common industry root cause analysis techniques.

- **Chapter 4** Examines the relationship of problem management to other ITSM processes and functions, including their inputs to, and outputs from, problem management. Processes included are: service level management; incident management; change management; configuration management; release management; knowledge management; financial management; capacity management; and supplier/vendor management. The functions include infrastructure functions, customer-facing functions and operations functions.

- **Chapter 5** Describes the different primary and complementary roles and responsibilities associated with problem management, and provides examples of various organizational models that can be implemented for the performance of problem management activities.

- **Chapter 6** Presents the common critical success factors, key performance indicators, and metrics used to measure the effectiveness and efficiency of a mature problem management process.

- **Chapter 7** Provides a list and explanation of the common success factors for implementing problem management; how to avoid common pitfalls; and how to 'sell' the value of problem management to your organization.

Foreword

David Cannon, vice-president and consulting director, Forrester Research

Problem management exists in most organizations, yet often does not achieve its full potential – frequently being relegated to a call-out box in the incident management process: 'resolve root cause'.

Problem Management: A Practical Guide embraces and expounds on the progress made over the last two decades while addressing the challenges that many organizations have experienced in attempting to achieve everything that problem management promised. It addresses three important areas that have limited problem management's success:

- **Technologists** While technologists frequently know how to diagnose root causes, interpret trends and keep equipment running, they often restrict the scope of problem management to their technical expertise. This disconnects the activities of keeping systems running from the activities of delivering true business value.

- **Tool vendors** Many tool vendors find the complexity of problem management difficult to deal with and focus on basic reactive techniques, such as detecting repeat incidents. While tool functionality has expanded, most implementations do not go beyond these basic tasks.

- **Best practices** Practitioners sometimes treat guidelines as absolute rules, and spend more time arguing over 'what the book says' than what problem management needs to achieve.

Throughout this guide, the authors challenge practitioners to take a more practical approach to problem management, specifically addressing:

- The notion that 'incident management' equals 'service desk' and that 'problem management' equals 'technical support'. Any approach that confuses a process with an organizational unit will run into turbulent political waters.

- Approaches that view problem management as a component of incident management. Every practitioner agrees that incidents and problems are related (and sometimes coincide) but that they are also different. Yet some practitioners fuse the processes and dilute the effectiveness of both.

- The practice of separating problem management from technical groups that use the process most. This guide views problem management as essential to enhance existing technology management activities.

Most importantly, *Problem Management: A Practical Guide* shows problem management to be a core business competency that is critical for the reliability and availability of the technology that makes an organization successful.

Rick Joslin, former executive director, HDI

The problem management process should be a core process in every organization's service management strategy. Yet many organizations have not implemented it formally and others struggle with it, often because of the lack of industry guidance and the lack of best-practice understanding. Throughout this guide, Jim and Buff have continued their personal missions to help organizations be more successful by sharing their expertise with the industry.

Historically, support organizations have focused heavily on optimizing incident management. The support analysts are the first responders and in the frontline when their customers are in need of assistance. Like fire-fighters, support analysts respond to resolve incidents in order to quickly restore services. If that is all the support organizations did, they would always be in a reactive state of fire-fighting incidents. By implementing problem management support, organizations are proactively investigating high-impact incidents and frequently recurring incidents. Problem management professionals have a role similar to those of the fire marshal and fire investigators. They must investigate and identify the root cause of the problems that generate incidents, with the ultimate purpose of eliminating the causes and/or identifying more effective resolutions when an incident occurs.

Technical support professionals and problem management professionals must work as one team, capturing and sharing knowledge to improve the quality of products and services while improving the bottom line for stakeholders. Knowledge management is a key connector between incident and problem management. When knowledge is captured, improved and reused within incident management by support professionals, valuable metadata is created to aid problem managers. As problem managers learn through their investigations, they share that knowledge with the support professionals by updating the knowledge base. Thus, support organizations need to master incident, knowledge and problem management to better service their customers.

The ultimate goal of a problem manager is not to manage problems, but to determine how to eliminate them. *Problem Management: A Practical Guide* will help professionals improve their personal knowledge and skills to investigate the problems that exist within their organizations. Organizations no longer need to struggle and experiment with problem management, as they can now learn from the experts.

Preface

One of the characteristics that high-performing IT organizations have in common is that they have a formal and well-defined problem management process. They recognize the need to move beyond the futility of merely resolving recurring incidents, and are determined to invest resources in identifying, documenting, investigating and permanently removing underlying problems from their computing environment.

While incident management focuses on restoring service as quickly as possible, problem management focuses on determining the root cause, identifying temporary workarounds and applying permanent fixes so that incidents do not reoccur. By analysing real-time and historical data, problem management can identify potential failures and correct issues before the customer is affected. Imagine meeting with your customers to tell them about 'the incident that never happened'!

The content of this publication is not intended to provide detailed instruction on root cause analysis (RCA) techniques. There have been several good books written on this topic, and there are organizations in the industry that provide in-depth training on these techniques. We will, however, introduce seven common RCA techniques and provide examples of their application.

Several years ago Propoint Solutions developed a problem management course based on feedback from our customers who were asking for guidance on how to improve their IT services. Since then, problem management has been the most popular process course that we have offered. In 2013 we partnered with HDI to establish standards and develop an expanded problem management professional certification course. The first such course was delivered in 2014, and since that time we have continued to expand and mature a body of knowledge around problem management from the experiences shared by colleagues and students in the classes. Many of those students have asked if we would write a book to provide them with additional guidance, templates and tools to help them develop and mature their problem management process. It is our hope that this publication will serve the needs of those students, and many others in our industry who are looking for guidance to improve their problem management process.

Jim Bolton
Buff Scott III

Acknowledgements

About the reviewers

Maysam Abedian

Maysam is the change, service introduction and major incident manager at Williams Lea Tag (Deutsche Post DHL group) and is an ITIL qualified professional with more than 15 years of industry experience, from both a technical and an ITSM background. He has been involved in implementing ITSM and service transition processes, as well as service desk functions and ITSM toolsets within organizations. Maysam's background includes a BSc degree in mathematics and computing and an MSc degree in information systems management.

Andy Atencio

Andy is the chief technology officer for the City of Greenwood Village, Colorado, USA, where he and his team have implemented many of the ITIL best practices. He has been involved with ITSM for more than 15 years, and is ITIL Expert certified. Andy has been using his experience in psychological assessment tools and a master's degree in psychology to educate other technology leaders and organizations that true technology leadership begins with people.

John Custy

John is the managing consultant at JPC Group and has spent his career working in IT and service management organizations, providing a practical and pragmatic approach to service management by putting people and outcomes first, then the processes, and finally the technology. He has helped organizations to improve the value of their services by showing service providers how their services impact outcomes. He has worked with all types of organizations and business units, including financial services, healthcare, pharmaceutical, higher education, manufacturing, non-profit and government agencies. He is also a well-known educator and speaker on service management.

1 Problem management – an ITSM process

Learning from others – Jim's experience

Many years ago I was hired by a technology start-up to bring my manufacturing process background and quality engineering experiences to the IT industry. At the time, it seemed odd to me because the industries were so different. Manufacturing was focused on identifying bottlenecks, and developing processes to make sure every activity was repeatable and predictable. IT saw processes as 'boring and non-creative'.

As I had the opportunity to assess numerous IT organizations throughout this new career, I discovered that successful IT organizations often followed a very similar and effective set of processes, while unsuccessful IT organizations often expressed that processes were constraining and slowed things down. As I continued to observe successful IT organizations, I documented their processes and integrated those processes into our growing company.

At one point, a friend heard what I was doing and suggested I might be interested in taking an ITSM class to learn more about best-practice processes for an IT organization. Initially I disregarded the idea as I already had processes that were working for us. Months later, I purchased a set of books on ITSM best practices and began reading. Honestly, I was looking for mistakes in the books to prove my friend wrong and to validate my belief that no one had better IT processes than ours.

Initially I was surprised to find that the processes described in the books were very similar to the processes we were using. However, I did find some 'mistakes' in the books, which I happily highlighted with red adhesive tabs so I could later show them to my friend. Over the next months I tried some of the new ideas I found in the books and discovered they addressed issues that we were having with our current processes. I still have those books with the red tabs in my library as a reminder that we can all learn from the experiences of others.

Before jumping right into problem management, let's begin by introducing/reviewing some fundamental ITSM concepts and terms.

1.1 What is IT service management?

'Service' is work performed on behalf of another that delivers value to the customer by enabling the customer to achieve desired organizational outcomes. IT service management (ITSM) is a methodology for planning, developing, delivering and managing IT services that are customer-focused and process-driven. It is about delivering services that are reliable and available. It is the effective and efficient application and management of service assets by the IT service provider for the purpose of delivering services that bring value to the customer by enabling them to achieve their desired outcomes.

IT service providers continue to face new challenges and opportunities that require them to adapt to an ever-changing business environment. Successful and innovative companies develop good practices, which evolve into best practices and eventually accepted practice, and in some cases they even become industry requirements. There are several ITSM best-practice frameworks available and it is common for IT service providers to make use of one or more of these. Some of the more widely known and used ITSM frameworks are:

- ITIL®

- MOF (Microsoft Operations Framework)

- ITUP 7 (IBM® Tivoli® Unified Process Operations Framework).

While it can be argued that ITIL is the most globally known and widely accepted ITSM framework in the world, there are a number of best practices, frameworks and standards that IT service providers commonly use when delivering services, such as:

- COBIT (Control OBjectives for Information and related Technology)

- SDLC (Software Development Lifecycle)

- ISO/IEC 20000 (an international standard for ITSM)

- PRINCE2® (PRojects IN Controlled Environments)

- Six Sigma (elimination of defects)

- TQM (Total Quality Management)

- Deming Cycle

- Agile

- DevOps

- PMI® (Project Management Institute)

- CMMI (Capability Maturity Model Integration)

- KCS (Knowledge Centered Support).

As IT organizations successfully adopt and adapt best practices, they will mature in the way they deliver services. Successfully using these best-practice frameworks and the 'Plan–Do–Check–Act' (PDCA) cycle made popular by William Deming,[1] they are able to reach higher levels of maturity. Over time, organizations will move from a fire-fighting and reactive mode, to becoming more proactive and delivering services of value to the business that are aligned with business plans and objectives. Additionally, as best-practice frameworks are in place, they keep organizations from sliding backwards over time. Figure 1.1 shows the maturity progression of an IT service provider as they use best-practice ITSM standards and frameworks.

Using these best practices, standards and frameworks provides benefits for the IT service provider and the businesses they support. Those benefits include:

- Increased productivity

- Increased customer satisfaction

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1 Dr William Deming is credited with transforming the automotive manufacturing processes in Japan after World War II by using the continual service improvement model, often referred to as the 'Plan–Do–Check-–Act' cycle developed by Dr Walter Shewhart.
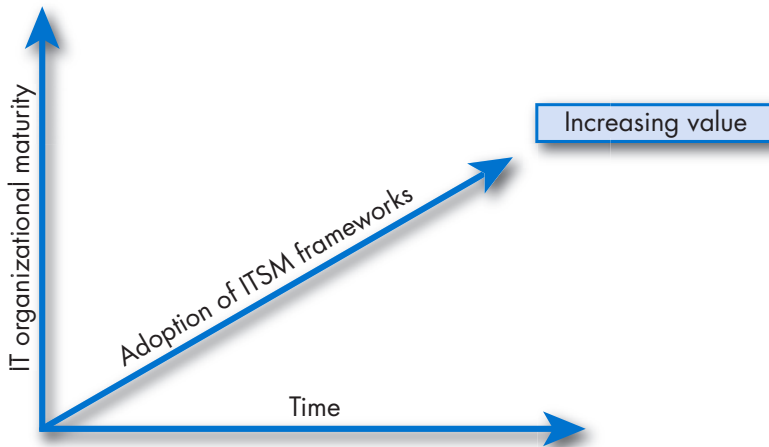
Figure 1.1 Using best-practice standards and frameworks for delivering IT services

- Reduced risk

- Reduced costs

- Improved communications and alignment between IT and the customer

- Consistent and predictable levels of IT support

- Customers know what to expect and what is expected of them

- Improved efficiency and effectiveness in delivering IT services

- IT services become part of the business strategy.

In Figure 1.2, we see a sample of services that an IT service provider might make available to its customers (e.g. email, web hosting, print services). The services should be delivered efficiently, effectively and predictably through the use of common and standardized processes.

Note
The customer may be internal (within the same organization) or external to the organization. Likewise, the IT service provider may be internal or external to the organization.

It's the outcome that's important – Jim's experience
As a customer, I take my shirts to a dry cleaning and laundry business. I don't know what kind of washing machine, or iron, or laundry detergent they are using, and I don't really care as long as my shirts are clean and pressed and delivered on time. It's the outcome, laundered shirts, which I am interested in.
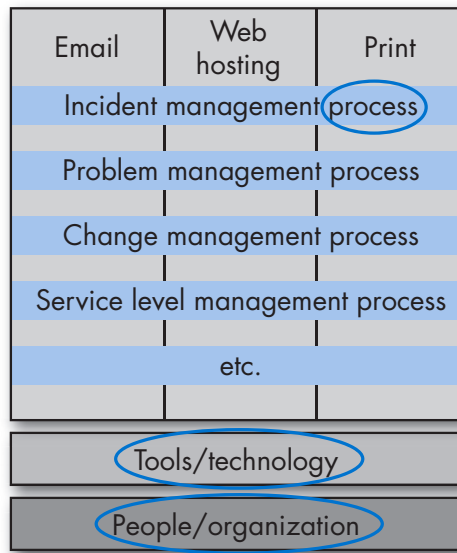
Figure 1.2 Services are delivered through a mix of people, process and technology

When we talk about IT services we're not simply talking about technology, we're talking about those services that directly support the business processes. In Figure 1.3 we see a number of different business units, each with their own business processes. We also see that the business processes are supported by IT services and those services are underpinned and supported by infrastructure. While it is necessary and important to manage servers, those servers are merely a means to the end. Delivery of a service that provides value to the customer is the goal.

If we identify IT service 1 as email, we can see that there are a number of technology components required to deliver the email service to the user. The user or customer is not interested in the technology components; they are simply interested in having email at their desk and knowing that when they hit the 'send/receive' button, their email will be successfully delivered and received.

Note
It is important to have your IT services well defined and documented, preferably in a service catalogue, for use by both IT staff and the business. If your services are not currently defined, begin with a list of strategic business customers or units and meet with key stakeholders in those areas to identify and define their vital business functions. A vital business function is a mission-critical function that the business depends upon and without which they cannot continue, where the financial or operational impact of the function becoming lost or degraded is not acceptable. Often, vital business function names reflect the actual service that IT is providing to the customer.
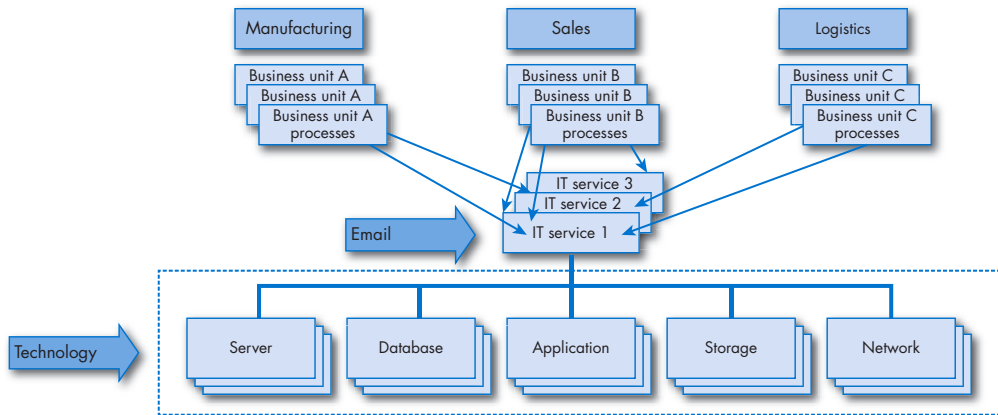
Figure 1.3 IT services supporting business processes

1.2 Processes and functions

> **We all need processes and functions – Jim's experience**
> Just as an IT organization needs processes and functions, so does my dry cleaners and laundry that I mentioned above. They have processes for receiving laundry, for washing, for drying, for ironing and for receiving payment. They also have people and/or equipment responsible for each of the specific functions within their organization.

Successful ITSM is dependent upon the use of well-defined, standardized and repeatable processes. In fact, one could say that ITSM is more process-focused and tied to process improvement efforts than it is about technology. Although not limited to just IT, these processes should span the various organizational departments or functional teams such as the applications team, the operations team and the network team. The reason we need processes to span these functional teams is because many of our daily IT organizational activities involve all of these teams working together. For instance, when email breaks and the user calls the service desk to report an outage, initially the service desk would not know whether the ticket should be assigned to the applications team, the operations team or the network team, because potentially the outage could need to be fixed by any of those teams. Thus, the incident management process spans all of those functional teams. With problem management the same is true. When we do a root cause analysis for email outages, we may need to pull together these same teams in order to get to the root cause. When scheduling a change to remove the error from the environment, the same is true again. We need to ensure that various functional teams approve the change and that the service desk has awareness of it so they can communicate any anticipated change-related impacts to the customer. From an ITSM perspective, processes span the functional teams and bring higher levels of efficiency and effectiveness.

In smaller organizations, the focus may not be on bringing together different teams, but rather about making sure the right individuals are involved. In a small organization the same person might be responsible for multiple functions, and in these instances the individual with responsibility for the service desk might also be required to assist in finding the root cause of a problem.

1.2.1 Processes

If manufacturers can do it, why can't IT? – Jim's experience
In manufacturing we had detailed processes for every activity on the production line. A new employee was able to pick up a process document (work instructions) and read how to successfully complete a specific manufacturing task. Any variation in manufacturing that was causing a product defect could be traced back to a poorly written process, lack of proper training, or an enforcement issue where an individual chose not to follow the process. Unfortunately, not all IT organizations are this disciplined. IT processes were often described as 'tribal knowledge'. I am frequently asked, 'Why do we need to write these things down when everyone knows the right thing to do'. Or, 'It's my job; I don't want someone telling me how to do my job.' Lastly, I sometimes hear about IT organizations that have documented their IT processes but failed to follow and/or enforce those processes. We refer to these procedures as 'write once read never'.

A process is a set of related activities that work together to provide value to the customer. They are designed to accomplish a specific objective by taking a set of inputs and transforming them into one or more outputs. Processes typically respond to a particular trigger or event. As an example, the incident management process may be triggered by a call to the service desk. The trigger for problem management will most often be one or more incidents.

A mature process is defined, documented, communicated/trained, measured and enforced. It should have an assigned owner, a set of activities, and procedures and work instructions that are performed by people and/or technology. It should be measured in terms of cost, quality, speed to delivery and compliance.

The three main components that make up a process are listed below and represented in Figure 1.4:

- Process controls
- Process structure
- Process enablers.

1.2.1.1 Process documentation

A well-documented process should have three process 'control' documents: the process policy, the plan and standard operating procedures (SOPs):
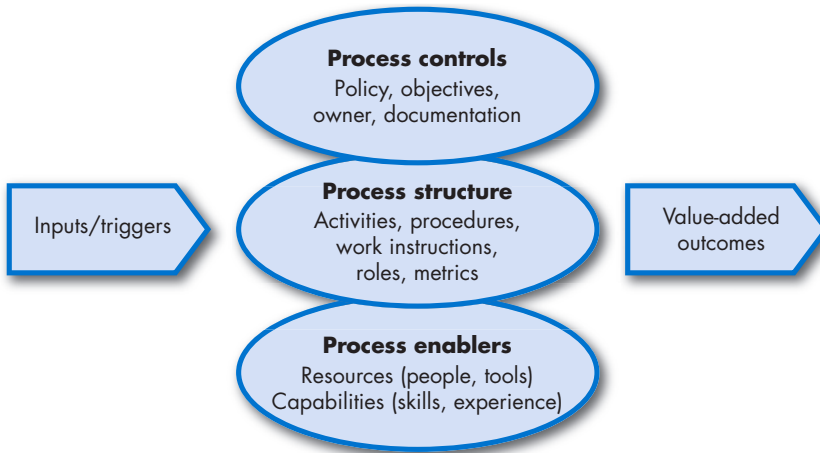
Figure 1.4 The main components that make up a process

- **Policy** Communicates management's intent and expectations regarding the process. (An example of a problem management policy is provided in Appendix A.)

- **Plan** Communicates the 'what' and the 'why' of the process, the goals and purpose, the roles and responsibilities, the metrics and the measurements to be used for the process, training requirements and tool access requirements. This plan needs to be specific to your organization (see the table of contents in Appendix B for help in structuring your problem management plan).

- **SOP** Communicates how to perform the process using the supporting tools. The SOP shows who's doing what tasks and in what order, and screenshots and detailed work instructions explain how those tasks and activities are performed using available tools that support the process (see Appendix C for an example of a problem management SOP).

These documents are necessary to ensure enterprise-wide understanding, and for the successful implementation and performance of the process. Documentation should be detailed, include activities, tasks and procedures, and must be complete, available and maintained to reflect the current process requirements.

1.2.1.2 Process roles

There are three common roles for every ITSM process. These roles are process owner, process manager and process analyst (also called 'process engineer' or 'process practitioner'). Table 1.1 provides a summary of the responsibilities of each of these generic roles. (We will discuss the specific roles related to problem management in Chapter 5.)

Table 1.1 Generic process roles and responsibilities

Role	Responsibilities
Process owner	Has overall accountability for a specific process, any design effort associated with that process, and ongoing process performance and improvement
	Ensures that the process and related policies are clearly defined, designed, documented, communicated, trained and performed to meet the needs of the customers/stakeholders
	Addresses process compliance issues
Process manager	Responsible for daily operational management of a process and for monitoring compliance with the process
	Works with the process owner to plan and coordinate all process activities and ensures all activities are carried out
	Monitors and reports on the performance of the process and identifies opportunities for improvement
Process analyst	Responsible for carrying out one or more process activities
	May be internal or external personnel (e.g. suppliers, contractors, service partners, or even customers/users)
	Works with other stakeholders (e.g. process manager, co-workers, customers) to ensure their actions are effective
	Ensures all their process activities, including inputs, outputs and interfaces to other processes, are properly executed
	Creates or updates problem records throughout their lifecycle to show that activities have been carried out correctly

1.2.2 Functions

Functions and processes – Jim's experience
When the service desk receives a phone call from a user complaining that their email is not working, this could be a network issue, a server issue, an application issue, a desktop issue, a mobile device issue, or possibly even operator error. IT organizations typically have functions (sometimes referred to as technical support groups) that are responsible for each of these technology domains. Each of these functions has their own body of knowledge and expertise. The processes we described earlier allow each of these functional teams to focus on their area of expertise while working together seamlessly with no overlaps and no gaps.

Functions, or functional teams, are units of organizations specialized to perform certain types of work and to be responsible for specific outcomes. They consist of a group of people and the service assets they use to carry out one or more process activities. These functional teams are often referred to as technical support groups within IT organizations and are typically defined by the technology domains they support.
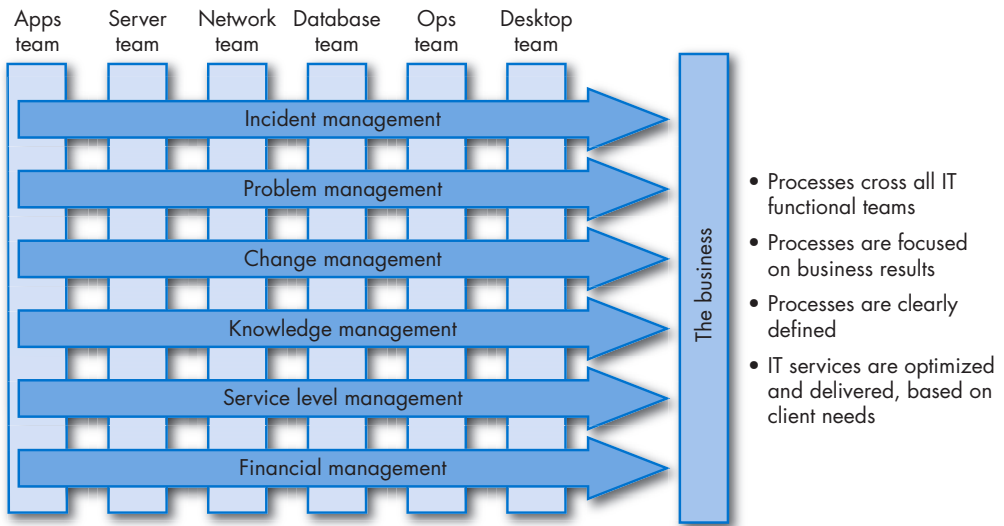
Figure 1.5 Processes cross organizational boundaries

Functions:

- Have defined roles and the associated authority and responsibility for specific performance and outcomes

- Have their own body of knowledge (that accumulates from experience)

- Provide structure and stability to organizations

- Optimize their work methods locally to focus on assigned outcomes

- Have their own terminology/language.

Processes help to improve cross-functional coordination and to ensure that functional teams are focused on business outcomes. Poor coordination between functions, combined with an inward focus, can lead to functional silos that hinder alignment and feedback critical to the success of an organization as a whole. Well-defined processes will reduce 'finger pointing' and improve productivity within and across the functional teams. Figure 1.5 illustrates how processes span organizational boundaries.

1.3 ITSM terms and definitions

ITSM provides a common language to facilitate the sharing of ideas. This has become even more important as organizations consider outsourcing portions of their IT operations. As an example, imagine how confusing it can be when many different words are being used to describe a service that is not performing as expected. Historically, those terms have included error, failure, outage, ticket, break fix, incident, event, problem and issue.

Before we go any further, we need to introduce some other terms that will be used throughout the rest of this publication:

- **Configuration item** (CI) An IT component that is recorded, managed and reported on via the configuration management process and controlled via the change management process. Examples of CI categories typically include IT services, hardware, software, buildings, people, and formal documentation such as process documentation and service level agreements.

- **Configuration management database** (CMDB) The CMDB is a database used to store configuration records throughout their lifecycle. Each CMDB stores attributes of CIs and their relationships to other CIs. The CMDB is the foundation of the configuration management process and is used by a number of ITSM processes. The CMDB is part of the configuration management system.

- **Configuration management system** A system and set of tools used for storing various types of data and process records, including incident, problem, change, release and configuration management records.

- **Customer** A person who purchases goods and services and is authorized to negotiate service level agreements. A customer may also be a user.

- **Incident** An unplanned event that disrupts the normal operation of a service, or causes a reduction in the quality of that service. This can include the failure of an IT component that has not yet impacted a service. In essence, something is broken or not working as expected. Incidents may be one-time events, major events or repetitive in nature.

- **Knowledge base** A searchable database of structured information and data pertaining to specific topics.

- **Known error** A problem that has a documented root cause and workaround.

- **Known error database** A database (or in some organizations a knowledge base) used to store previous knowledge of incidents and problems (symptoms, workarounds and solutions) enabling quicker diagnosis and resolution in the future.

- **Problem** The cause or potential cause of incidents where the root cause is not usually known.

- **Root cause** The cause of an incident or problem to which a fix may be applied to resolve or prevent recurrence.

- **Solution** An identified means of resolving an incident or problem that permanently fixes the underlying root cause.

- **User** A person who uses IT services as part of their day-to-day work activities.

- **Workaround** A temporary method of reducing or eliminating the impact of an incident until a permanent resolution is available.

1.4 What is problem management?

> **Tip**
> Problem management is one of the core ITSM processes that an IT service provider should have in their service delivery toolkit. Providing a stable and available computing environment is not possible when the IT service provider does not possess the ability to effectively react to and prevent service disruptions.

Problem management is recognized as the ITSM process where trends and causal factors are analysed to determine the root cause of one or more incidents. This information is then used for the development of workarounds and resolutions to those incidents. As we will see in later chapters, problems have a lifecycle. The purpose of problem management is to manage all problems throughout their lifecycle from detection, to logging, to categorizing and prioritizing, investigation and diagnosis, documentation and eventual removal of the error from the computing environment. Problem management records and reports information that enables end-to-end visibility of problems. It provides accurate and reliable data on problem management activities to IT and the business. This information includes the status of problems and known errors, root causes and trend analysis, workarounds and resolutions, and compliance with the process.

The activities associated with problem management can be organized into four major categories:

- **Detection and categorization** Those activities focused on identifying, logging, classifying and prioritizing problems

- **Investigation and diagnosis** Those activities focused on identifying root causes and transforming problems into known errors

- **Resolution and recovery** Those activities focused on identifying, approving, applying and validating permanent fixes to problems and known errors

- **Closure** Those activities focused on closing problems, known errors and related incidents with updated and reusable information

Figure 1.6 reflects these four categories of major activities and provides a summary of the tasks associated with each.

1.4.1 Reactive versus proactive

The scope of problem management includes two different aspects – reactive problem management and proactive problem management.

Reactive problem management is focused on solving problems in response to one or more incidents as they occur. Proactive problem management is focused on identifying and solving
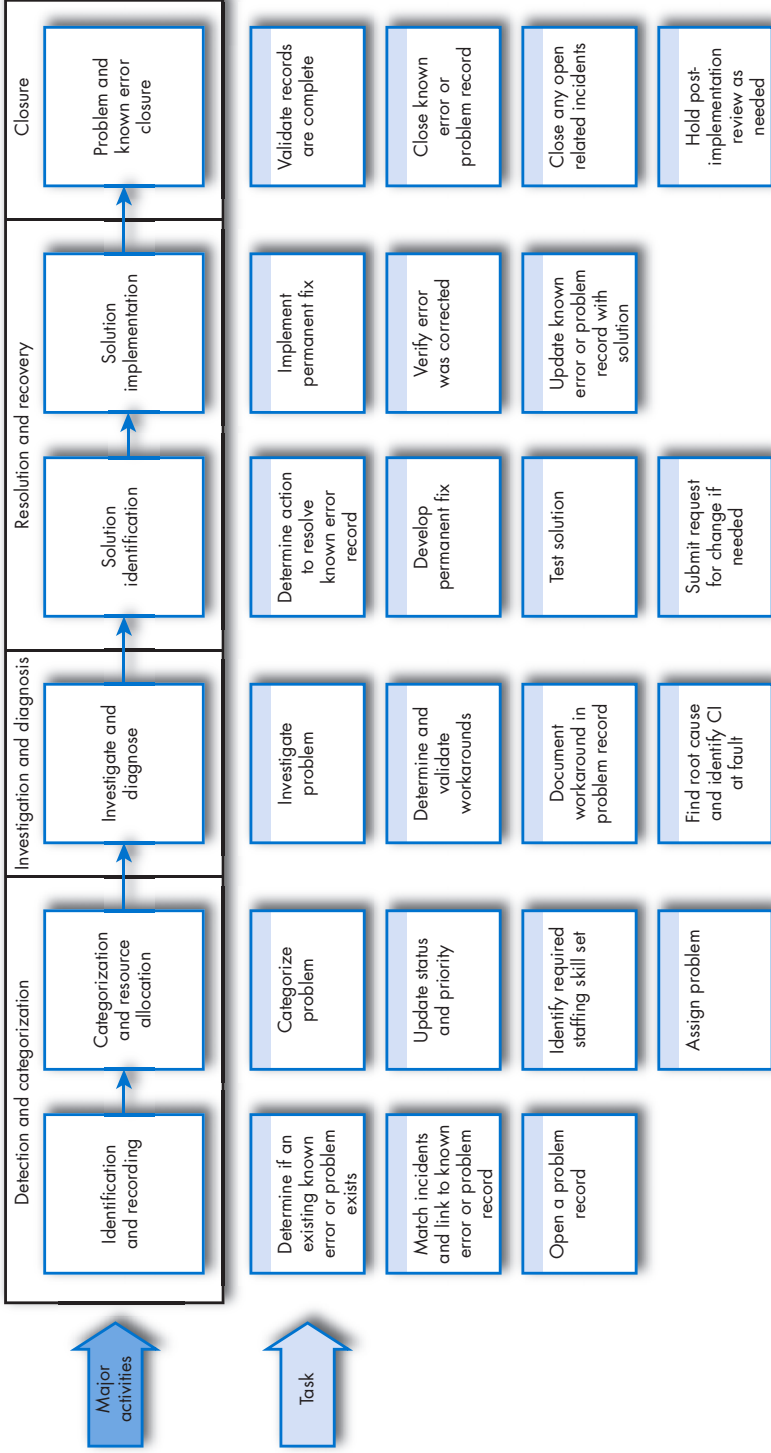
Figure 1.6 High-level overview of the problem management process

Is it worth being proactive? – Jim's experience

We frequently experience internet service outages in the neighbourhood. When I call our service provider to advise them of the outage they say they are sorry and hope to have it repaired soon. They always offer a service credit to my next bill reflecting the duration of the service outage. The credit amounts to around one pound when the internet is down for an entire day. It's my opinion that bad service for free is still bad service. In contrast, our local utility company sends out an advance notice to let us know that they will be performing preventive maintenance to replace a water line which is aging and nearing the end of its useful life. Our utility company even sends out a newsletter each month to let us know about proactive work they are doing in other parts of our city. I love our utility company for being proactive. It's possible that we pay a bit more because of their proactive work. However, I suspect that it's much less expensive to schedule the replacement of a water line than it would be to call out an emergency crew and equipment after a pipe bursts. Perhaps our internet service provider could learn a lesson from our utility company. Perhaps there is a lesson in this for all of us.

problems and known errors that might otherwise be missed (e.g. a database gradually running out of disk space), looking for trends and patterns, staying abreast of known errors from suppliers and community groups, and solving problems before incidents occur or reoccur. This analytical activity by problem management captures and reviews operational, maintenance and event logs to identify underlying problems and to understand the IT infrastructure's stability, usage and criticality in support of the business environment. By analysing that information, problem management is able to foresee and correct errors before the manifestation of incidents. In this sense, the process becomes proactive.

Proactive problem management is focused on:

- Identifying problems before they are experienced by the business

- Preventing problems from occurring (i.e. eliminating potential incidents and conflicts within the infrastructure)

- Reducing the probability that an identified risk will occur and/or implementing steps to reduce the impact should the problem occur

- Gathering lessons learned from major problem reviews for continuous improvement purposes

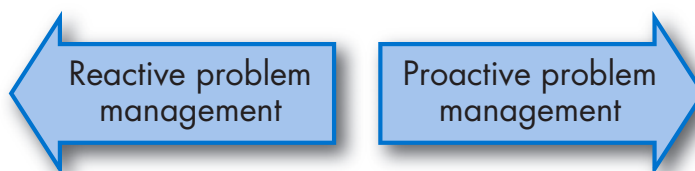- Improving service quality and reliability.

Figure 1.7 The two main aspects of problem management

Figure 1.7 reflects the two aspects of problem management. Notice the reactive arrow is pointing backwards (i.e. an incident has occurred) while the proactive arrow is pointing forward (i.e. looking ahead to identify potential incidents).

Problem management is more than just restoring services and applying permanent fixes to incidents, it is also about providing a stable and available infrastructure that supports business processes. Common benefits of implementing problem management are:

- Higher availability and reliability of IT services – i.e. improved service quality

- Higher productivity of the users and IT staff

- Increased customer satisfaction with IT

- Shorter resolution times (i.e. improved time to restore service) through collaboration and use of workarounds

- Improved management information reporting on problems and their status

- Reduction in costs for the management and resolution of incidents and problems

- Higher levels of compliance with service level agreements

- Reduction in time spent resolving problems by having a standardized approach – no more trial and error

- Reduction in incident volume (by eliminating recurring incidents)

- Improved first-call resolution through better information in the known error database or knowledge base

- Improved use and allocation of IT support staff

- Reduction in duplication of effort among functional teams in the development and application of workarounds and solutions to incidents

- Improved information, documentation, knowledge transfer and decision-making for support of the infrastructure

- More effective purchasing and asset management through a better understanding of problematic IT components

- Ability to identify under-engineered systems.

When performed well, problem management is an indication of a more mature IT service provider. However, research has shown that problem management is not performed at all, or is merely 'under development' in 51% of IT organizations surveyed.[2] Implementing problem management can be challenging; however, for those companies who have invested in implementing a best-practice problem management process, the payoff has been significant. So, how did they do it? What made them successful where others have failed?

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2   Rains, Jenny (2014). Problem management in technical support. *HDI Research Brief,* April 2014.