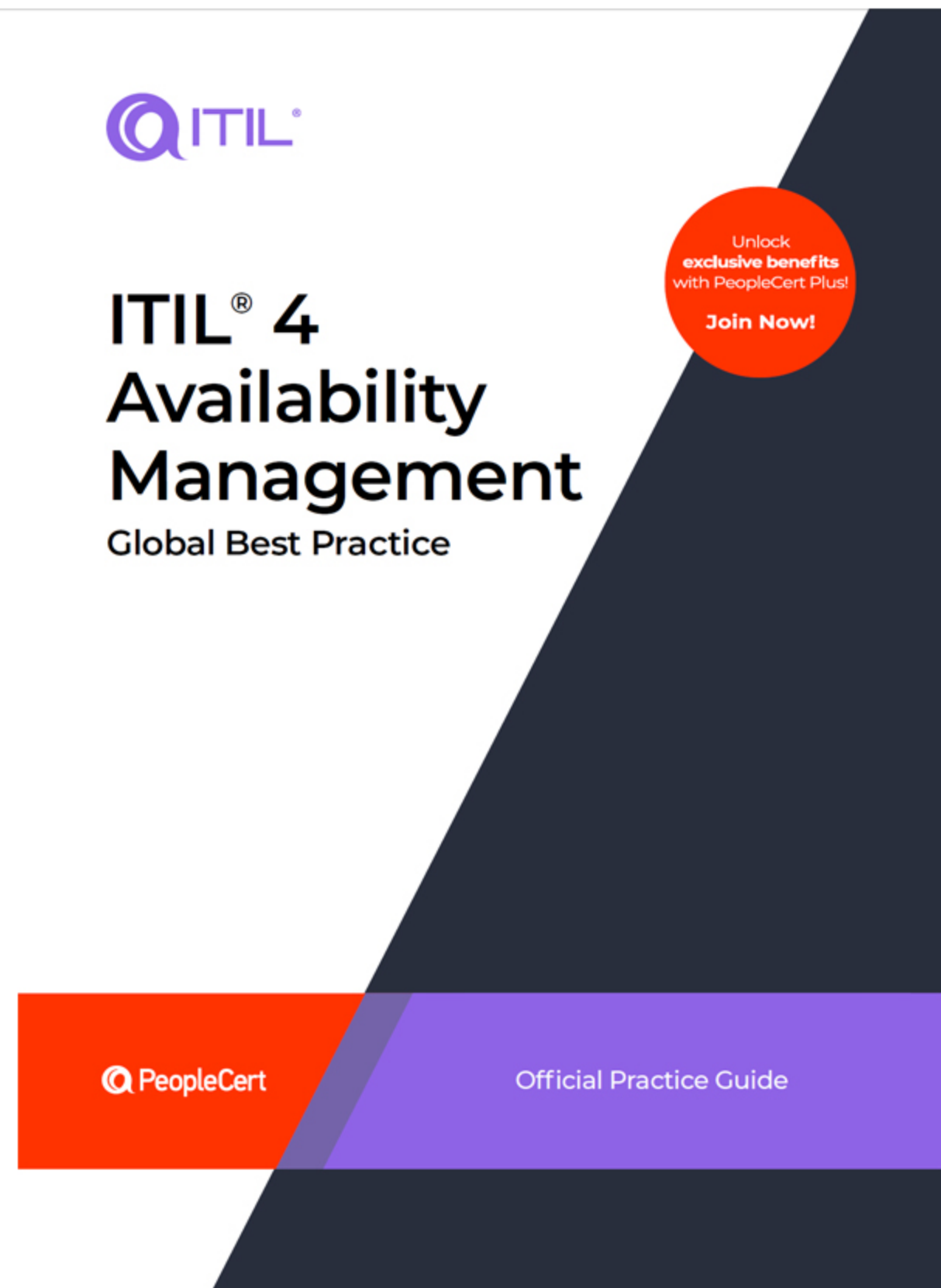


ITIL® 4 Availability management | Official Practice Guide

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ITIL[®] 4 Availability Management

Global Best Practice

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Welcome





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Authors

Pavel Demin

Reviewers

Roman Zhuravlev

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Antonina Douannes, Adam Griffith, Dmitry Isaychenko, Kaimar Karu, Stuart Rance, Roman Zhuravlev





Information icons



Key message



Definition



Tip



Chapter 1

About this guide

This Official Practice Guide provides practical guidance for the infrastructure and platform management practice. It is split into seven main sections, covering:

- general information about the practice
- the practice's processes and activities and their roles in the service value chain
- the organizations and people involved in the practice
- the information and technology supporting the practice
- considerations for partners and suppliers for the practice
- information on assessing and developing the capability of the practice
- recommendations for succeeding in the practice.

ITIL® 4 qualification scheme

Selected content from this guide is examinable as a part of the following syllabus:

- **ITIL® 4 Specialist:** High-Velocity IT

Please refer to the relevant syllabus document for details.

Chapter 2

General information

2.1 Purpose and description



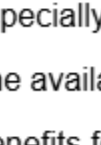
Key message

The purpose of the availability management practice is to ensure that services deliver the agreed levels of availability to meet the needs of customers and users.

The availability management practice ensures that requirements for the availability of services and resources are understood and fulfilled efficiently and in line with the organization's strategy and commitments. To enable this, this practice is applied throughout the organization's product and service lifecycle from ideation to operations.

This practice is extremely important when products and services are planned and designed, decisions made at this stage will affect availability levels and related constraints, as well as the organization's ability to monitor and manage these aspects.

Availability is an important service characteristic from the consumers' perspective, and therefore it is subject to negotiation, agreement, monitoring, and reporting. These activities involve multiple practices (including the business analysis, relationship management, service design, service level management (SLM), and measurement and reporting practices, among others), and the availability management practice is used in conjunction with those to ensure that availability is sufficiently and consistently addressed.



Availability

The ability of an IT service or other configuration item to perform its agreed function when required.

Theoretically, availability is simple to measure and understand, it depends on how frequently the service fails and how quickly it recovers after a failure. These characteristics are often expressed as mean time between failures (MTBF) and mean time to restore service (MTRS).

- MTBF measures how frequently the service fails. For example, on average, a service with a MTBF of four weeks fails 13 times each year.

- MTRS measures how quickly service is restored after a failure. For example, on average, a service with a MTRS of four hours will fully recover from failure in four hours.

In practice, availability is a complex characteristic. For it be measured and understood, multiple measurements and agreements about how these measurements should be understood in the context of a service are needed. Availability depends on the service architecture, importance of certain service components or service actions, criteria of unavailability, service hours, and other parameters.

Availability can be defined differently for different types of service offerings. The availability of some services may be measured and reported in terms of percentage uptime based on MTBF and MTRS, but other services may be measured in terms of the number of transactions that were lost due to downtime, or the average time to complete a long transaction. For example:

- A service that supports a loan approval process may report the percentage of loan applications that were not processed within five minutes due to IT failures.

- A service that provides network connectivity may be measured in terms of the number of minutes when the network was not available.

- A service that provides user support may be measured in terms of the percentage of requests that were not delivered in agreed times.

Availability from the perspective of a user or a group of users can be different from the availability measured from the provider's or customer's perspective. For example, a service that is unavailable to five users in a group of 200 will be perceived by the five as interrupted, but the agreed availability targets for the group may still be met.

The availability management practice should ensure a transparent, consistent, and practical understanding of availability (expected, agreed, designed, and actual) among all relevant parties.

When a service is provided to thousands or even millions of people, there is not usually a single generic availability agreement with customers, but the overall service availability is critical for the service provider. Such services are usually designed for high availability, where reliability (high MTBF) is balanced with fast recovery (short MTRS).

Availability is closely connected to service performance, capacity, continuity, and information security. The ITIL management Official Practice Guides that discuss these areas often address the same characteristics of configuration items and services but focus on different aspects of their quality. These practices can significantly benefit from sharing resources of all four dimensions of service management, however, clear separation of responsibilities is required in some cases, especially in heavily regulated areas, such as service continuity and information security.

The availability management practice has multiple benefits for both service providers and consumers.

Benefits for the service provider include:

- improved resource management
- ability to respond to changing service requirements quickly and effectively
- higher levels of customer and user satisfaction
- more effective performance management through optimizing the level of performance to meet valid service needs
- greater linkage between business and service provider objectives
- ensures that services are financially viable.

Benefits for the service consumer include:

- assurance that the quality of service required to meet business objectives will be delivered as needed
- clear expectations about what to expect from the service provider
- improved communication about service requirements
- improved ability to detect and communicate service exceptions
- ensures that services are financially viable.

2.2 Terms and concepts

Service availability is central to business success; there is a direct correlation between service availability and customer and user satisfaction. However, it is possible to achieve customer satisfaction when services fail. The way in which a service provider reacts in a failed situation has a major influence on customer perception.

It is difficult to improve availability without understanding how the services support the consumer.

2.2.1 Vital business function

A vital business function (VBF) is any capability or function of a business process that is required to ensure the success of the business. It is important to understand these VBFs in order to identify which service functions and capabilities are essential, and which are less important to the service consumers.

For example, a bank may provide ATMs that dispense cash, but these ATMs may also support balance enquiries, funds transfer between accounts, or other types of account support. The organization may decide that the ability to dispense cash is a VBF, but the other capabilities of the ATM are less important. This means that the IT services that support cash dispense are essential, but the other IT services are less important.

This distinction between vital and non-vital functions is important and should influence availability design and associated costs. Generally, the more vital the business function, the more resilient and available the supporting IT services need to be.

Where there is a narrow band of visibility and services are standardized, an SLA will contain a more public, or external, specification of service levels. For example, an SLA could be defined as:

- A description of the target service level and the approach to its monitoring, measurement, and reporting, used by a service provider to monitor and manage the quality of its services.

2.2.2 Availability criteria

Defining availability requirements for services is often complicated. A service may have multiple functions and customers, each of whom may have different availability requirements for each function.

Quite often for non-functional requirements, the line between underperformance (the service being slow, insecure, non-compliant, and so on) and unavailability is difficult to identify.

When defining service availability, it is essential to consider the following:

- the criticality of business functions that are enabled by the service
- thresholds for various forms of underperformance and unavailability, for example, a five-minute delay in sending or receiving e-mail may be treated as service level degradation, but a five-day delay could be treated as service unavailability. The SLA should include agreed thresholds for this type of distinction
- the number of users, business units, and/or sites that are impacted, for example, the service may only be considered unavailable if more than a certain percentage of users are impacted
- whether certain vital users, business units, sites, and so on, are impacted, for example, for an email service, it may be that, if users who need to communicate directly with customers and partners are able to use the service, the service is considered available

- the service delivery schedule and peak hours; a service that only has outages at night or on weekends may not be considered unavailable.

These factors reflect how the service provider and customers define unavailability. It is good practice to document the agreed availability criteria for the service in a service level agreement.

2.2.3 Availability metrics

Availability is one of the most essential aspects of service quality, so service providers must be able to measure, assess, and report availability. Widely accepted practice is to report availability as a percentage, which can be calculated using a simple formula:

- Availability = (agreed service time – downtime) / agreed service time

This formula can be useful, especially for resource provision services, but it does not reflect the business impacts of complicated service disruption scenarios.

The ideal availability metric would measure losses to service consumers caused by service unavailability. Unfortunately, it is often difficult or impossible to measure or estimate such a metric. Therefore, the service provider and the customer should define a set of acceptable metrics that reflect the impact of service outages on the service consumer's business results, even if these metrics may be slightly inaccurate.

The following factors should be considered, but these are only examples, and may not be true for some services:

- The longer the cumulative service downtime is, the higher the losses are.
- The longer a single service outage is, the higher the losses are. In most cases, financial losses grow exponentially during an outage. The service provider may face fines, regulatory judgments, diminished competitive advantage, reputational damage, and so on.
- The more frequent the outages are, the higher the losses are, because the expenses associated with managing a loss event and restarting business operations are high.

Availability measurements are based on accurately tracked periods of downtime. Therefore, one of the most important objectives for the Availability management practice is to design and manage availability monitoring tools and translate the resulting data into meaningful service availability information.

Table 2.1 outlines some common availability measurement methods.

Table 2.1 Availability measurement methods

Availability measurement methods	Description
Incident records	<p>Incident records usually include the timestamps when the incident was identified and resolved so that the duration of outage can be calculated. However, this method has limitations, including:</p> <ul style="list-style-type: none">• The incident may not be identified and recorded at the same time as the service becoming unavailable.• The incident may not be resolved, and its resolution may not be recorded, at the same time as service availability is restored.• Not all incidents are availability incidents (see section 2.2.2 for details about availability criteria).• Related incident records should be linked and the possible overlap of incidents over time should be considered in order to accurately estimate the period of downtime. <p>In small-scale service providers, this method of measuring availability may work well, but it is less useful in large-scale organizations due to the larger number of services and incidents.</p>
IT infrastructure monitoring	<p>Infrastructure monitoring tools are also sources of availability data. However, such tools measure CI availability, not service availability. Service and configuration models might be used to understand service availability based on components' availability data.</p> <p>However, this method's limitations should be considered:</p> <ul style="list-style-type: none">• The service component outage may not cause a service outage.• Service unavailability may be caused by underperformance, as well as the outage, of components.• Some service impacting incidents may not be detected by monitoring. For example, if all transactions are giving incorrect results, then the service is unavailable, but the tools may not detect this. <p>Some of these issues might be overcome by developing a service health model, a model that determines how the underperformance or outage of a component impacts other components in the service model.</p> <p>Developing a service health model is a time-consuming exercise that, in many cases, is not the best use of time because the IT infrastructure changes rapidly.</p>
Business transaction monitoring/real user monitoring	<p>Business transaction monitoring is a way of measuring the availability and performance of IT services from a business operations/transactions perspective. A variety of data collection methods might be used for the purpose, including network packet sniffing, log parsing, agent-based middleware protocol sniffing, reading database records, and others.</p> <p>Two particular methods of business transaction monitoring are:</p> <ul style="list-style-type: none">• Synthetic monitoring: a method for monitoring applications by simulating users' activity. Synthetic monitoring uses simulated transactions from a robot client that mimic typical user actions.• Real user monitoring (RUM): RUM may capture server-side data in order to reconstruct end-user experience or directly monitor user interactions with the application and what users experience at the point of service consumption.

For further discussion of how to measure, assess, and report service availability see section 2.4.2 below.

2.3 Scope

The availability management practice ensures that services deliver agreed levels of availability to meet the needs of customers and users cost-effectively. To achieve this, the practice includes the definition, measurement, analysis, and improvement of availability and provides a centre of expertise for availability matters to support other service management practices.

The scope of the availability management practice is very broad. Almost every ITIL practice contributes to service availability, directly or indirectly. Activities of other practices that are closely related to the Availability management practice are listed in Table 2.2. It is important to remember that ITIL practices are merely collections of tools to use in the context of value streams; they should be combined as necessary, depending on the situation.

Table 2.2 Activities related to the availability management practice described in other Official Practice Guides

Activity	Official Practice Guide
Negotiating and agreeing customer requirements for availability	Service level management
Designing availability controls as a part of the service model	Service design
Aligning availability controls with business architecture	Architecture management
Identifying risks associated with availability	Risk management
Analysing the impacts of changes on availability targets	Change enablement
Monitoring the availability of services	Monitoring and event management
Justifying new availability controls	Availability management
Implementing risk mitigation measures	Project management
Changing the IT infrastructure to improve availability	Change enablement
Testing availability controls during the service transition	Service validation and testing
Reacting to events which might affect the organization's ability to meet availability targets	Incident management
Managing availability incidents	Monitoring and event management
Managing and implementing improvements on an ongoing basis	Continual improvement

2.3.1 Scope

The line between the service continuity and availability management practices is subtle. Both practices involve the concept of risk and identifying and preparing for events that threaten to disrupt services. For both practices, either an understanding of VBFs and risk assessments, or a business impact analysis (BIA) of service failures is required. Ultimately, both practices ensure the organization's resilience to failures.

Some organizations prefer not to separate availability and continuity management. However, there are some differences, as are outlined in Table 2.3.

Table 2.3 The distinction between the availability management and service continuity management practices

Availability management	Service continuity management
Focuses on high-probability risks	Focuses on high-impact risks (emergencies, disasters)
Reduces the likelihood of unwanted events	Reduces the impacts of unwanted events
Focuses on technical solutions	Focuses on organizational measures
Focuses on optimization	Focuses on creating redundancy
Is not a part of the corporate function	Often is part of the corporate function
Ensures service quality during business-as-usual	Ensures service quality during force-majeure
Measured with MTRS, MTBF, mean time between service incidents	Measured with recovery time objective, recovery point objective, minimum target service level

The service continuity management practice does not cover minor or short-term failures that do not have serious impacts on the organization. It focuses on risks associated with significant damage, regardless of the likelihood of their occurrence. Often these are emergency situations, disasters such as fires, flooding, power outages, data centre or site failures, and so on. Although the Availability management practice does not ignore the negative impacts of failures on the service provider and the consumer, minor interruptions of individual components are also considered in the process.

There is a tension between the objectives of the practices. The availability management practice works with statistics and analyses trends; continuity management is concerned with how to respond to disruptive events.

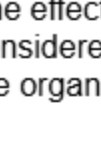
2.3.2 The role of availability management in managing service risks

The concept of risk is central to the availability management practice. In order to meet service availability targets, the practice needs information about risks, which can be provided by the Risk management practice.

An effective availability management practice can therefore contribute significantly to risk management. A large proportion of risk mitigation measures are related in some way to availability controls.

Availability management generally focuses on identifying and eliminating single points of failure or unreliable or weak components when it is cost-justifiable (see section 2.4.3 for details).

2.4 Practice success factors



Practice success factor (PSF)

The ability of an IT service or other configuration item to perform its agreed function when required.

A PSF is more than a task or activity, it includes components from all four dimensions of service management. The nature of the activities and resources of PSFs within a practice may differ, but together they ensure that the practice is effective.

The availability management practice includes the following PSFs:

- establishing a shared view of target service levels with customers
- identifying service availability requirements
- measuring, assessing, and reporting service availability
- treating service availability risks.

2.4.1 Identifying service availability requirements

To effectively manage availability, the service provider should identify the service availability requirements. These requirements should reflect how service customers may be impacted by service outages.

Identifying a service's availability requirements may be a separate activity, but it is more commonly a part of service level negotiation within the SLM practice, or a broader BIA performed jointly with the service continuity management practice. Availability requirements may also be identified as part of the business analysis that is carried out in the early stages of creating a new or changed service.

Identifying service availability requirements includes:

- **Understanding customer requirements for service availability:** the business analysis and SLM practices involve communicating with customers to understand their availability requirements for IT services and negotiating service level requirements. The availability management practice provides important support and input to the SLM, business analysis, and service design practices. Availability requirements always need to balance cost and quality, the availability management practice can play a key role in optimizing the availability of a service to meet increasing availability demands while deferring an increase in costs.

- **Determining availability criteria:** availability criteria should be defined, usually based on the suggestions in section 2.2.3 above. These should specify when a service is deemed to be available, and when it is unavailable, in clear, unambiguous terms that are easy for service consumers to understand.

- **Determining availability metrics and setting targets:** availability is the most crucial service quality indicator because service customers typically lose money or suffer other significant losses when there are service outages. Availability metrics and targets should accurately reflect how consumers are impacted by service unavailability.

2.4.2 Measuring, assessing, and reporting service availability

Service providers must be able to measure, assess, and report availability correctly. It is a widely accepted practice to report availability as a percentage, which can be calculated using a simple formula based on uptime and downtime. Although it can be suitable in many cases (especially for resource provision services), this method lacks visibility of the business impacts of complicated service disruption scenarios.

It is important to consider various ways of measuring, assessing, and reporting availability, including, but not limited to, the following metrics (see section 2.2.4 for details):

- MTBF
- minimum time between failures
- number of service disruptions
- total downtime over the period
- maximum single outage
- MTRS

Whichever set of metrics is suitable for a service, it is important to reflect the business impact of service disruptions, rather than the technical availability of service components.

One of the most important objectives for the availability management practice is to design and ensure sufficient availability monitoring, then to translate the monitoring data into meaningful service availability information.

Incident records are one obvious source of service disruptions data. However, it is often difficult to obtain reliable availability data based on incident records, especially for user-reported incidents. It is also difficult to align the data with agreed service availability metrics.

Infrastructure monitoring tools are more reliable sources of availability data. However, although they work well for measuring resource provision services, it is very difficult to measure the availability of services that enable business operations correctly based on infrastructure monitoring data. Tools such as real user monitoring, business transaction monitoring, and so on can help with this (see section 2.2.4).

2.4.3 Treating service availability risks

The availability management practice is not only about planning and monitoring availability. This practice includes the definition and management of controls to manage a range of risks that might impact service availability. For this, it is used in conjunction with the risk management practice and other risk-focused practices (including the service continuity management, capacity and performance management, and information security management practices). An effective availability management practice can make a significant contribution to risk management.

The measures outlined in Table 2.4 may be designed and implemented as a part of an overall risk mitigation plan.

Table 2.4 The four dimensions of availability management

Service management dimension	Countermeasures to availability risks
Organizations and people	Developing the people's capabilities with training
Information and technology	<p>The exploitation of fault-tolerant technology to mask the impacts of planned or unplanned component downtime</p> <p>Duplexing, or the provision of alternative IT infrastructure components, to allow one component to take over the work of another component</p> <p>Improving component reliability by enhancing testing regimes</p> <p>Improving software design and development</p> <p>Introducing a resilient telecommunication network</p> <p>Data protection in operation: RAID arrays and disk mirroring for LAN servers to prevent data loss and ensure the continued availability of data</p> <p>Procurement of high availability options from cloud service suppliers and partners</p> <p>Monitoring (to provide prompt alerts)</p>
Partners and suppliers	Improved externally supplied services, contracts, or agreements
Value streams and processes	<p>Improved incident management</p> <p>Improved testing, and regular testing of countermeasures to ensure that they remain effective as the service evolves</p> <p>Continuous integration/continuous delivery</p>

When choosing an availability control, the effectiveness and efficiency of each option should be assessed. It is also important to continually control and validate the effectiveness and efficiency of availability arrangements.

- **Effectiveness:** according to risk management principles, the effects of availability controls should be assessed and compared to the expected losses due to incidents.

- **Efficiency:** the costs of an availability control should also be assessed and compared to its benefits. Benefits are calculated by estimating the reduction in the likelihood of incidents after the control is implemented, then multiplying it by the severity of the impact the incidents would have if they occurred. This value should be compared in terms of cost to the cost of implementing the measure (cost benefit analysis can be used here).

It is usually cheaper to design the right level of service availability into a service from the start, rather than try and add it subsequently. Also, once a service gets a reputation for unreliability, it becomes very difficult to repair.

The following forms of loss, proposed by factor analysis of information risk (FAIR), might be useful when assessing service availability risks:

- **Productivity:** the reduction in a service provider's ability to deliver services.
- **Response:** expenses associated with managing a loss event.
- **Replacement:** the intrinsic value of an asset, or the expense associated with replacing lost or damaged assets (such as purchasing a replacement server).
- **SLA fines and regulatory judgments:** legal or regulatory actions levied against the service provider.
- **Competitive advantage:** losses associated with diminished competitive advantage.
- **Reputation:** losses associated with an external perception of the service provider.

It is also important to understand how impacts may change over time. Losses due to service outages often grow exponentially over time. Along with losses related to the reduction in an organization's ability to generate its primary value proposition, reputational risks and the threat of financial sanctions arise.

Agreed availability controls are implemented through the service design, software development and management, and infrastructure and platform management practices.

2.5 Key metrics

Key metrics for the availability management practice are mapped to its PSFs. They can be used as KPIs in the context of value streams to assess the contribution of the practice to the effectiveness and efficiency of those value streams. The key metrics are listed in Table 2.5.

The effectiveness and performance of the ITIL practices should be assessed within the context of the value streams to which the practices contribute. The context of the business and the value streams is important to define what is considered good or not so good performance of a practice. This is why this Official Practice Guide cannot recommend universal key performance indicators for availability management: the target values for each metric can only be defined in the organization's context.

Table 2.5 Key metrics for the practice success factors


Practice success factors	Key Metrics
Identifying service availability requirements	<p>Percentage of products and services with clearly documented availability criteria</p> <p>Percentage of (critical) products and services with availability requirements agreed with customers and documented in an SLA</p> <p>Timely updating of service availability requirements in case of service changes</p>
Measuring, assessing, and reporting service availability	<p>Percentage of products and services with determined availability metrics</p> <p>Percentage of products and services covered by availability and performance monitoring</p> <p>Percentage of products and services included in service availability reports</p>
Treating service availability risks	<p>MTBF</p> <p>Minimum time between failures</p> <p>Number of service disruptions</p> <p>Total downtime over the period</p> <p>Maximum single outage</p> <p>MTRS</p> <p>Percentage of effective availability controls</p> <p>Percentage of availability controls tested in the last period (six months / year)</p> <p>Ratio between actual losses and expected losses</p>

Chapter 3

Value streams and processes

3.1 Processes

Each practice may include one or more processes and activities that may be necessary to fulfil the purpose of that practice.

 **Process**

A set of interrelated or interacting activities that transform inputs into outputs. A process takes one or more defined inputs and turns them into defined outputs. Processes define the sequence of actions and their dependencies.

Availability management activities form two processes:

- **Managing product and service availability:** this process is focused on analysing, designing, and monitoring availability of resources, products, and services throughout their lifecycle. The process supports design, implementation, delivery, monitoring, and support of agreed levels of availability.
- **Measuring and reporting availability:** this process is focused on design, implementation, and continual improvement of availability measurement and reporting capabilities. It ensures sufficient understanding of product and service availability and supports agreed quality of products and services.

3.1.1 Managing product and service availability

This process includes the activities listed in Table 3.1 and transforms the inputs into outputs.

Table 3.1 Inputs, activities, and outputs of the 'managing product and service availability' process

Key inputs	Activities	Key outputs
Customer requirements Business and technology architectures Service catalogue Service specifications Service models and configuration models Agreements with suppliers and partners User and customer feedback Improvement plans and registers Financial information	Analyse availability requirements Propose and verify solution design Support and verify solution testing and implementation Support and verify availability monitoring and reporting Analyse availability data and initiate improvements	Availability requirements report Availability design solutions Availability test verification Resource, product, and service availability records and reports Periodic availability report Improvement initiatives

Figure 3.1 shows a workflow diagram of the process.

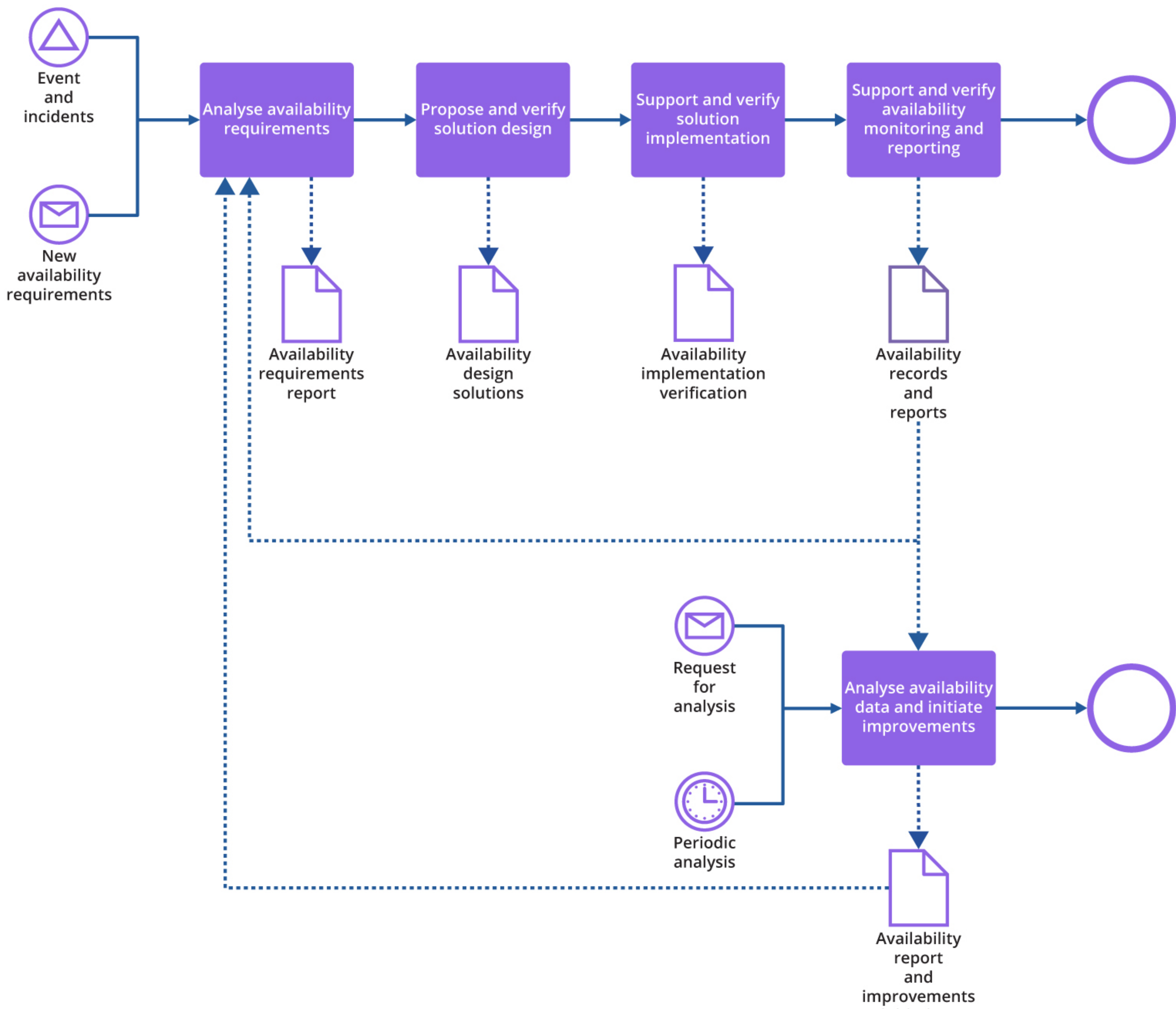


Figure 3.1 Workflow of the 'managing product and service availability' process

These activities may be performed with varying levels of formality by many people in the organization and may apply to resources, products, or services. Table 3.2 describes these activities further.

Table 3.2 Activities of the 'managing product and service availability' process

Activity	Description
Analyse availability requirements	Resource/product/service owner (depending on the level of availability requirements), service designer, infrastructure engineer, software developer review and analyse the availability requirements coming from either service customers or another service provider team. The requirements are mapped to the available resources and funds, architectural constraints, and other relevant factors. If the requirements are not viable, this conclusion is communicated to the originator of the requirements. Availability requirements analysis may be triggered by events or incidents indicating that previously agreed level of availability is not being reached or under threat. In such situations, relevant specialists review availability records and reports aiming to identify what can be improved in the current solution design or its implementation.
Propose and verify solution design	If the availability requirements are viable, resource/product/service owner (depending on the level of availability requirements), service designer, infrastructure engineer, software developer and other relevant specialists identify and propose one or more solutions to meet the requirements. These solutions serve as input to service design activities (see ITIL® 4 Service Design Official Practice Guide).
Support and verify solution implementation	During development, testing, deployment, and release of the selected solution, service owner (or another relevant owner role, depending on the level of the solution) ensures that the agreed availability solution is implemented correctly, and that availability levels are tested and confirmed. This activity adds availability perspective to many activities of the following practices. <ul style="list-style-type: none">• software development and management• infrastructure and platform management• service validation and testing• deployment management• release management.
Support and verify availability monitoring and reporting	When the solution (resource, product, or service) is live, agreed availability records and reports are generated manually and/or automatically. A relevant owner (resource, product, or service) reviews the records and reports to verify that they are produced in line with the agreed availability solution. If the records and reports are not valid, the owner reports an incident.
Analyse availability data and initiate improvements	Resource/product/service owner, together with other relevant specialists, regularly reviews availability records and reports to identify trends in resource, product, and service availability. Resulting availability review report may include improvement initiatives which may inform availability design. This review may also be requested by various stakeholders (customers, architects, executive leaders, and others).

3.1.2 Measuring and reporting availability

This process ensures an end-to-end availability measurement and reporting across the organization and its service ecosystem, including availability of relevant third-party services. It may also include certain level of visibility of the customer's resources involved in service consumption.

This process includes the activities listed in Table 3.3 and transforms the inputs into outputs.

Table 3.3 Inputs, activities, and outputs of the 'measuring and reporting availability' process

Key inputs	Activities	Key outputs
Availability reporting needs and requirements Customer requirements Business and technology architectures Service catalogue Service specifications Service models and configuration models Agreements with suppliers and partners	Analyse availability measurement and reporting needs and capabilities Agree availability measurement and reporting requirements Design availability measurements and reports Implement availability measurement and reporting Review availability measurement and reporting	Availability monitoring, measurement, and reporting designs Availability records and reports Improvement initiatives

Figure 3.2 shows a workflow diagram of the process.

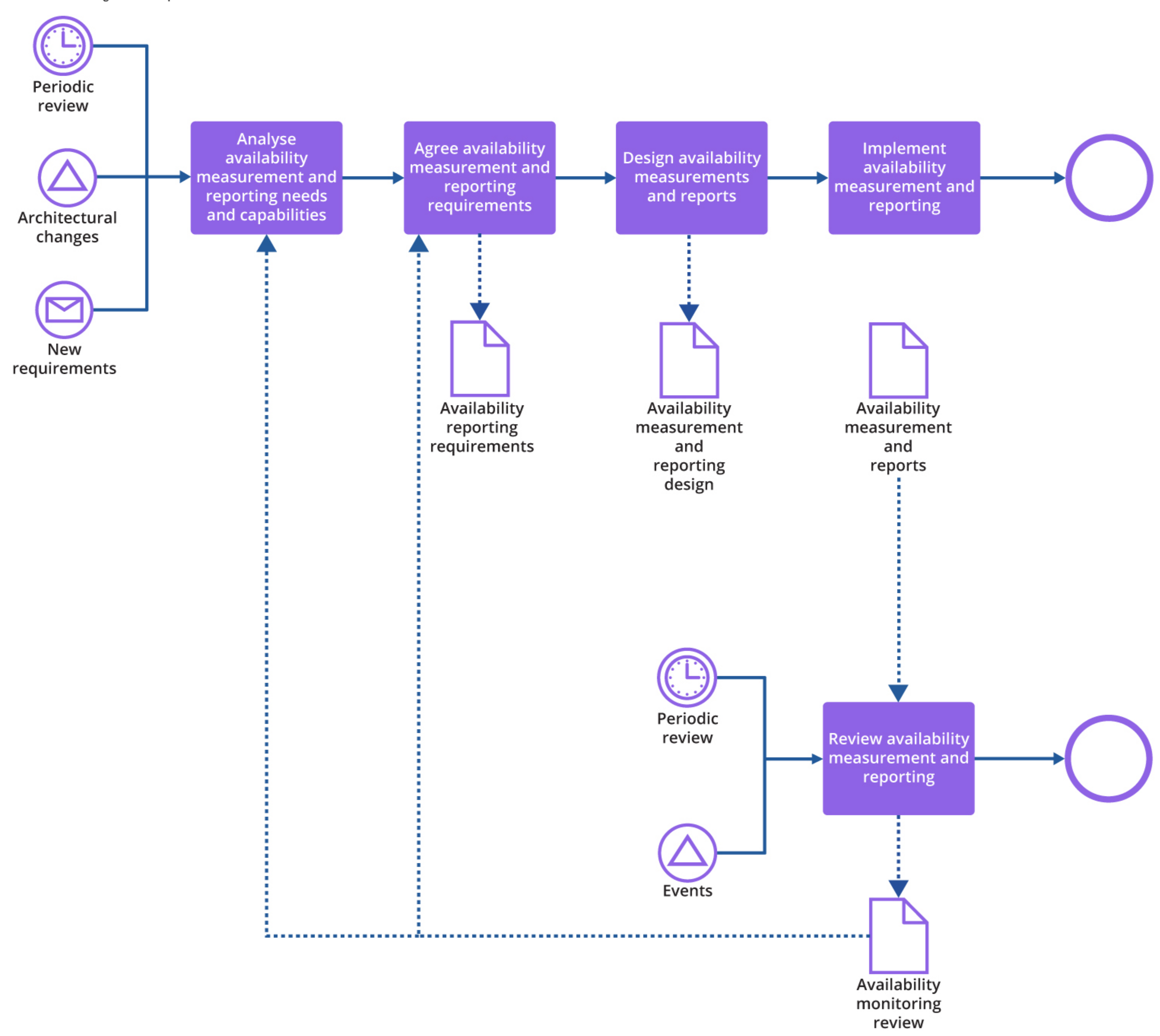


Figure 3.2 Workflow of the 'measuring and reporting availability' process

Table 3.4 provides an overview of the process activities.

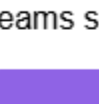
Table 3.4 Activities of the 'measuring and reporting availability' process

Activity	Description
Analyse availability measurement and reporting needs and capabilities	Availability manager collects and analyses availability reporting needs of resource, product, and service owners, customers, service continuity managers, information security managers, and other stakeholders. Together with business and technology architects and other specialists, availability manager reviews organization's availability measurement and reporting capabilities and constraints. Resulting report includes prioritized availability reporting requirements mapped to available monitoring, measurement, and reporting capabilities (or lack thereof).
Agree availability measurement and reporting requirements	Availability manager discussed the identified requirements and supporting capabilities with the stakeholders. Together they agree on realistic solutions based on the available capabilities or plan implementation of additional measurement and reporting capabilities to meet the requirements.
Design availability measurements and reports	Based on the agreed list of requirements, availability manager designs and proposes measurement and reporting solutions. They are discussed with relevant stakeholders. Discussions include financial and technical capabilities, timelines, and other relevant aspect of the measurement and reporting solutions.
Implement availability measurement and reporting	Agreed and approved measurement and reporting capabilities are implemented using such practices as Project management, Change enablement, Service design, Supplier management, and others, depending on the solution. Availability manager monitors the implementation and accepts the results. Implemented measurement and reporting capabilities are then used to monitor and manage availability of resources, services, and products, as described in section 3.1.1.
Review availability measurement and reporting	Availability manager, together with relevant stakeholders, reviews utilization, effectiveness, and efficiency of the availability measurement and reporting capabilities. Resulting report may include improvement initiatives which may inform availability design. This review is conducted regularly and may also be requested by various stakeholders (architects, executive leaders and others).

3.2 Value stream contribution

3.2.1 Service value streams

To perform certain tasks or respond to particular situations, organizations create service value streams. These are specific combinations of activities and practices, and each one is designed for a particular scenario. Once designed, value streams should be subject to continual improvement.

 **Value stream**

A series of steps an organization undertakes to create and deliver products and services to consumers.

In practice, however, many organizations identify the value stream concept after having worked for a while (sometimes for years) without the value streams being managed, mapped, or understood. This means that when the importance of the concept becomes clear, the first step is to understand and map the 'as is' situation and the true flows of work, then analyse them in order to identify and eliminate the non-value-adding activities and other forms of waste.

Identifying and understanding existing value streams is critical to improving an organization's performance. Mapping activities in the form of value streams allows the organization to understand what it delivers and how, and to make continual improvements to its services. Combined, an organization's value streams form an operating model which can be used to understand and improve how the organization creates value for the stakeholders.

Many organizations follow best practice recommendations for various service management practices, such as incident management, change enablement, software development, and many others. However, the practices are often adopted and organized in a siloed, isolated manner, just as they are presented in service management bodies of knowledge. In reality, a flow of work required to create or restore value, for a customer or another stakeholder, is almost never limited to one practice.

3.2.2 Availability management in service value streams

Availability management plays a key role in many different value streams. This practice contributes directly to the design, creation, maintenance, and continual improvement of services, and has important interactions with practices that resolve incidents.

Table 3.5 describes how the key service value streams involve availability management.

Table 3.5 Availability management in key service value stream

Value stream	The role of availability management
Creation of a new or changed product or service	Evaluating customer requirements for availability and helping to analyse the costs and risks of alternative solutions to achieve these Design for monitoring and reporting service availability to be included in the overall service design
Service delivery	Monitoring service availability and identifying trends and risks that could result in failure to meet agreed service level targets
Product and service support	Analysis of incident data that could impact availability targets Creation of problem records based on analysis of availability data
Product and service operations	Monitoring service availability and identifying trends and risks that could result in failure to meet agreed targets Proactively taking action when agreed availability targets are at risk. For example, by negotiating for additional resources to monitor services or purchasing additional vendor support for a short period of time Regular testing of availability controls, such as dual network routing or failover between instances of a service
Continual improvement of products and services	Identifying opportunities to improve service availability or reduce costs while still achieving agreed levels of availability Continual improvement of the availability management practice itself

The effectiveness and efficiency of many of the value stream activities is assessed based on the agreed service targets. This makes these value streams highly dependent on the availability and quality service level agreements. The availability management practice is therefore critical for many service value streams.

3.2.3 Analysing a service value stream

3.2.3.1 The key steps of a service value stream analysis

The following are some simple and practical recommendations for service value stream analysis and mapping.

1. **Identify the scope of the value stream analysis:** this can be mapped to a particular product or service or applied to most or all of them. Similarly, service value streams may differ for different consumers, for example, incidents can be solved and communicated differently for internal and external customers, B2B and B2C products, or services based on products developed in-house or sourced externally. Interactions with users and customers during incident handling and resolution may follow different models in each of these scenarios.
2. **Define the purpose of the value stream from the business standpoint:** make sure the stakeholder's concerns are clearly understood, since they are the ones defining value. The definitions of service quality should be aligned with the organization's strategy and support value creation for the organization and other stakeholders.
3. **Do the service value stream walk:** walk through or directly experience the steps and information flow as they go in practice (consider the Lean technique of Gemba walk).

a. Identify the workflow steps

b. Collect data as you walk

c. Evaluate the workflow steps:

typically, the criteria for evaluation are:

- value for the stakeholder (does the step add value for the business stakeholder? Does it support the relationship approach?)
 - effectiveness or performance (is the step performed well?)
 - availability (are required resources available to execute the step?)
 - capacity (are the required resources enough?)
 - flexibility (are the required resources interchangeable within the step?)
- d. **Map the activities and the information flows:** in an ideal situation, the flow goes smoothly without delays and pauses, there are no disconnections between the steps, and the workload is level with minimal (and agreed) variation.
- e. **Create and review the timeline and resource level:** map out process times and lead times for resources and workload through the workflow steps.

4. **Reflect on the value stream map (VSM):** identify factors that might not have been entirely apparent at first. The information collected is used at this step to find the waste. Some commonly performed interactions between stakeholders and team members can be undocumented or even contradict the agreed procedures.

5. **Create a 'to be' VSM:** this informs and drives improvement. The value stream should be managed holistically to ensure end-to-end efficiency and value creation, not just local improvements.

6. **Using the 'to be' VSM plan improvements:** refer to the ITIL® 4 Continual Improvement Official Practice Guide for a practical improvement model. Include relationship models in the continual improvement plan for the value streams.

3.2.3.2 Availability management considerations in a service value stream analysis

To ensure that relevant availability management activities are included in service value streams, the following steps can be added to the above recommendations:

- At the scoping step (1), identify the customers related to the value stream and other involved external and internal stakeholders. What are their service availability expectations? Do they use availability data and reports? Are these stakeholders satisfied?
- During the service value stream walk (3a), identify the practices involved at every step and how availability targets and metrics are used. What service availability targets and data are readily available? Are there situations where required availability information is not available? Is there any evidence that availability management controls are regularly tested?
- During the workflow steps evaluation (3c), evaluate the impact of availability management on the value stream's effectiveness and efficiency. Special attention should be paid to steps where required availability information is not available or insufficient. Do availability targets stimulate the right behaviour? Does availability management create any risks or delays in the value stream? Are availability management reports sufficient? Are they available when needed and in a convenient form? Are availability management activities automated where appropriate? Are steps taken to continually improve service availability and ensure that it meets or exceeds customer expectations?
- At the convention and planning steps (4-5), ensure that availability reports are available to the relevant stakeholders throughout the value stream and their provision and use are optimized for business value.
- Include the creation or update of the availability controls, measurements, dashboards and reports in the value stream improvement plans (6).

Chapter 4

Organizations and people

4.1 Roles, competencies, and responsibilities

4.1.1 Availability manager

In some organizations there is a dedicated availability manager; in other organizations this role may be combined with other IT service management roles.

This role is typically responsible for:

- establishing and communicating the scope and policy for availability management
- assigning responsibility and authority, for other availability management roles as appropriate
- ensuring that the availability requirements of customers are understood sufficiently early that these can be incorporated into the designs of new and changed services
- ensuring that availability controls are developed, tested, and updated as needed
- ensuring that availability measurement and reporting is carried out and that customers are satisfied with the reports
- ensuring that the availability of services continues to meet the evolving needs of customers in a cost effective way
- managing a centre of excellence (if one is needed) to ensure that best practice is shared across the organization and a consistent approach to availability management is taken where appropriate
- ensuring that the performance of the availability management practice is monitored, reviewed, and improved.

4.1.2 Availability management roles in an organization

The ITIL practices do not describe the practice management roles such as practice owner, practice lead, or practice coach. They focus instead on the specialist roles that are specific to each practice. The structure and naming of each role may differ from organization to organization, so any roles defined in ITIL should not be treated as mandatory, or even recommended. Remember, roles are not job titles. One person can take on multiple roles and one role can be assigned to multiple people.

Roles are described in the context of processes and activities. Each role is characterized with a competency profile based on the model shown in Table 4.1.

Table 4.1 Competency codes and profiles

Competency code	Competency profile (activities and skills)
L	Leader: decision-making, delegating, overseeing other activities, providing incentives and motivation, and evaluating outcomes
A	Administrator: assigning and prioritizing tasks, record-keeping, ongoing reporting, and initiating basic improvements
C	Coordinator/communicator: coordinating multiple parties, maintaining communication between stakeholders, and running awareness campaigns
M	Methods and techniques expert: designing and implementing work techniques, documenting procedures, consulting on processes, work analysis, and continual improvement
T	Technical expert: providing technical (subject matter) expertise and conducting expertise-based assignments

The roles which are typically involved in the availability management activities are listed in Table 4.2, together with the associated competency profiles.

Table 4.2 Roles involved in the availability management activities

Activity	Responsible roles	Competence profile	Specific skills
Managing product and service availability			
Analyse availability requirements	Product owner Service owner Resource owner Service architect Availability manager	TCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements for products, services, and resources
Propose and verify solution design	Product owner Service owner Resource owner Service architect Availability manager	TMCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements of products, services, and resources Expertise in availability measurement Good knowledge of service design
Support and verify solution implementation	Product owner Service owner Resource owner Service architect Availability manager	TMCA	Good knowledge of the organization's architecture, products, and services Good knowledge of the availability solutions Expertise in availability measurement Good knowledge of service implementation practices
Support and verify availability monitoring and reporting	Product owner Service owner Resource owner Service architect Availability manager	TMCA	Good knowledge of the organization's architecture, products, and services Good knowledge of the availability solutions Expertise in availability measurement Good knowledge of service operations and support practices
Analyse availability data and initiate improvements	Product owner Service owner Resource owner Service architect Availability manager	TMCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements of products, services, and resources Expertise in availability measurement
Measuring and reporting availability			
Analyse availability measurement and reporting needs and capabilities	Product owner Service owner Resource owner Service architect Availability manager Service designer	TCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements of products, services, and resources Expertise in availability measurement Expertise in measurement and reporting
Agree availability measurement and reporting requirements	Product owner Service owner Resource owner Service architect Availability manager Service designer	TMCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements of products, services, and resources Expertise in availability measurement Expertise in measurement and reporting
Design availability measurements and reports	Product owner Service owner Resource owner Service architect Availability manager Service designer	TMCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements of products, services, and resources Expertise in availability measurement Expertise in measurement and reporting
Implement availability measurement and reporting	Product owner Service owner Resource owner Service architect Availability manager	TCA	Good knowledge of the organization's architecture, products, and services Good understanding of the stakeholders' requirements of products, services, and resources Expertise in availability measurement Expertise in measurement and reporting
Review availability measurement and reporting	Product owner Service owner Resource owner Service architect Availability manager Service designer	TMCA	Good knowledge of the product and service architecture, configuration, and technical details Creativity Systems thinking

4.2 Organizational structures and teams

Although the role of availability manager may be supported with formal positions and job descriptions, it is unusual to see a dedicated organizational structure for the availability management practice. Service availability is usually managed by other practices and organizational functions, as described in Table 4.2.

In a large organization with many services there may be a dedicated availability management team, with specialist knowledge of availability controls, tools, and techniques. This team will provide guidance and support to the teams responsible for all aspects of designing, creating, maintaining, monitoring, and continually improving services, but will not typically design the services or implement the technology.

Even in the smallest organization, someone needs to take on the role of availability manager. This may not be a dedicated role and can be combined with many different service management roles, including service continuity management, risk management, problem management, and possibly even incident management. It is not usually appropriate to combine availability management with roles that are mainly focused on new or changed services (such as service design or release management) because this may lead to a lack of focus on maintaining, monitoring, and continually improving availability of services.

In product focused organizations the responsibility for developing, exercising, maintaining, and improving availability controls may be included in each product team. In this situation a centre of excellence for availability management can be created to ensure that best practice is shared across the product teams and a consistent approach to availability management is taken where appropriate. Management of this centre of excellence would typically be part of the availability manager role.

Chapter 5

Information and technology

5.1 Information exchange: inputs and outputs

The effectiveness of the availability management practice is based on the quality of the information used. This includes, but is not limited to, information about:

- consumer's business processes
- services and their architecture and design
- partners and suppliers and information on the services they provide
- regulatory requirements regarding service availability
- technology and services available on the market that may be relevant for service availability arrangements
- information about monitoring tools and techniques.

This information may take various forms, depending on the service relationship (internal or external service provision, tailored or out-of-the-box services, and so on). The key inputs and outputs of the practice are listed in Chapter 3.

5.2 Automation and tooling

The availability management practice can significantly benefit from automation. Where this is possible and effective, it may involve the solutions outlined in Tables 5.1 and 5.2.

Table 5.1 Automation solutions for the availability management practice

Automation tools	Application in availability management
Analysis and reporting tools	Analysis of availability data and creation of regular availability reports
Automated testing tools	Regular testing of availability management controls to ensure that they will work correctly when needed
Business process modelling tools	Identification and prioritization of VBFs
Availability and capacity modelling and management tools	Modelling the effect of availability controls to help predict availability of new and changed services
Collaboration and communication tools	Working across practices and teams to integrate availability management into value streams for designing, creating, maintaining, monitoring, and continually improving services
Architecture management tools	Integrating availability management into architectural plans to ensure it is used consistently
Knowledge management tools	Sharing knowledge and information about availability management tools, techniques, and controls
Monitoring and event management tools	Measuring availability of services and components to support creation of regular availability reports Triggering corrective action when trends indicate that availability targets might be breached
Risk management tools	Documenting availability related risks and managing them through their lifecycle
Service catalogue tools	Identifying services and service models to help identify the need for availability controls Service portal can be used for sharing availability dashboards and reports
Service configuration management tools	Identifying components that contribute to services to enable design and management of availability controls
Workflow and task management tools	Initiating changes to implement new or changed availability controls Identifying incidents that may impact availability of services

Table 5.2 Automation solutions for availability management activities

Process activity	Means of automation	Key functionality	Impact on the effectiveness of the practice
Managing product and service availability			
Analyse availability requirements	Analysis and reporting tools Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Architecture management tools Knowledge management tools Service configuration management tools	Business impact analysis Service configuration modelling Availability modelling and calculation Team collaboration Risk assessment	Medium to high
Propose and verify solution design	Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Architecture management tools Workflow and task management tools	Business impact analysis Service configuration modelling Availability modelling and calculation Team collaboration Risk assessment	Medium to high
Support and verify solution implementation	Analysis and reporting tools Automated testing tools Availability and capacity modelling and management tools Collaboration and communication tools Monitoring and event management tools Service configuration management tools Workflow and task management tools	Service configuration modelling Availability modelling and calculation Team collaboration Project reporting	High
Support and verify availability monitoring and reporting	Analysis and reporting tools Availability and capacity modelling and management tools Collaboration and communication tools Monitoring and event management tools Service configuration management tools Workflow and task management tools	Availability modelling and calculation Team collaboration Impact assessment	High
Analyse availability data and initiate improvements	Analysis and reporting tools Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Architecture management tools Knowledge management tools Risk management tools Service configuration management tools Workflow and task management tools	Business impact analysis Service configuration modelling Availability modelling and calculation Team collaboration Risk assessment	Medium to high
Measuring and reporting availability			
Analyse availability measurement and reporting needs and capabilities	Analysis and reporting tools Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Architecture management tools Knowledge management tools Monitoring and event management tools Risk management tools Service catalogue tools Service configuration management tools Workflow and task management tools	Business impact analysis Service configuration modelling Availability modelling and calculation Team collaboration Risk assessment	High
Agree availability measurement and reporting requirements	Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Workflow and task management tools	Business impact analysis Service configuration modelling Availability modelling and calculation Team collaboration	High
Design availability measurements and reports	Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Workflow and task management tools	Service configuration modelling Availability modelling and calculation Team collaboration	High
Implement availability measurement and reporting	Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Workflow and task management tools	Service configuration modelling Availability modelling and calculation Team collaboration Project reporting	Medium
Review availability measurement and reporting	Analysis and reporting tools Business process modelling tools Availability and capacity modelling and management tools Collaboration and communication tools Architecture management tools Knowledge management tools Monitoring and event management tools Risk management tools Service catalogue tools Service configuration management tools Workflow and task management tools	Business impact analysis Service configuration modelling Availability modelling and calculation Team collaboration Risk assessment	High

5.2.1 Recommendations for automation of availability management

The following recommendations can help when applying automation to availability management:

- **Visualize product and service models:** use service configuration management tools or other available systems to produce and analyse visual models of products, services, and components, to help identify availability risks and required availability controls.
- **Use automation to trigger availability controls from monitoring and event management:** whenever possible, availability controls should trigger automatically when they are needed. For example, failover between instances of an application, or between network paths, should happen quickly, and reliably, with no discernible impact on end users.
- **Monitor trends and take action before availability targets are breached:** availability management should not simply monitor and report that targets have or have not been achieved. It is possible to detect when a service is nearing a breach, or is not behaving in the expected way, and take proactive action to ensure that the availability targets are met. For example, it might be possible to purchase 24/7 support for a few weeks from a vendor when the contract normally only provides support during the working day, or to negotiate a temporary increase in budget for additional cloud infrastructure if excess workload is creating availability risks. It might even be possible to use AI to monitor and identify when this type of action is required and trigger the required actions.
- **Integrate availability targets in all relevant workflows:** link availability targets to the relevant workflows (such as incident management and service level management), monitoring data (such as incidents and performance of configuration items), and external service performance (such as cloud service availability and response time). Set notification thresholds in the context of the availability targets.
- **Use a wide range of monitoring and data collection tools:** availability is not a simple, one dimensional aspect of a service. Simply collecting incident data or component availability data is not sufficient. A wide range of different monitoring tools and techniques is needed to provide a holistic view of service availability.
- **Consider use of evolving AI tools:** AI tools may be able to create a consolidated view of availability based on a wide range of different data types collected in different ways from multiple sources. This is especially important for high volume services with large numbers of independent end users, where social media, email, or free text in incident records, may be able to provide critical availability data in an unstructured format.
- **Automate creation of dashboards and reports:** monthly reports can only give an outdated view of service availability. Automation can enable the creation of dashboards and reports on demand that will give customers and other stakeholders, an up-to-date view of service availability that is focused on their specific needs.

Chapter 6

Partners and suppliers

6.1 Dependencies on third parties

Very few services are delivered using only an organization's own resources. Most, if not all, depend on other services, often provided by third parties outside the organization (see section 2.4 of ITIL® Foundation: ITIL 4 Edition for a model of a service relationship). Relationships and dependencies introduced by supporting services are described in the ITIL® 4 Official Practice Guides for Service Design, Architecture Management, and Supplier Management.

Partners and suppliers may provide critical products and service components, such as cloud infrastructure, network connectivity, or components that are sold to the service provider. The service provider needs to negotiate and agree availability requirements with partners and suppliers in order to meet service availability requirements. These requirements may include:

- **High availability solutions for critical third party products or services:** so that these will remain available even if technology components fail.
- **Service continuity plans for critical third party products or services:** to ensure that these will be recovered in times that support the availability requirements of the organization
- **Access to a knowledge base:** to provide timely access to information about issues and workarounds related to the availability of the third party product or service.
- **Automated feeds of monitoring and event management data from the third party:** so that failures of third party services can be detected quickly.
- **Support hours that match the requirements of the service provider:** so that issues can be resolved in a timely way. This may be especially important if the supplier is in a different time zone to the service provider.
- **Updates to service components to maintain their reliability:** including software or firmware patches, driver updates, and any other updates that may be needed. The third party should specify the expected life of components and may need to provide a commitment to provide security and availability related updates for this lifetime.

6.2 Support from third parties

Partners and suppliers may also provide services and solutions for ensuring resilience, such as fault-tolerant and clustering technologies, load balancing, multi-level backup systems, monitoring tools, and so on. In these cases, they should consider service availability when designing and planning service provision.

Third party support for availability management may include:

- **Provision of software tools:** most software tools used for availability management are shared with other practices. However, some tools may be acquired and used exclusively to manage service availability. The organization should define the automation requirements from all related practices to ensure that the right tools are procured, implemented, and used in an optimal way.
- **Performing risk analysis:** a third party may have specialist knowledge of the risks related to a particular technology or industry. This can help to ensure that risks are correctly identified and analysed.
- **Designing high availability solutions or architectures:** a third party with specialist knowledge of the industry, and related products, may be well placed to design, or help with the design, of availability controls for a new or changed service.
- **Provision of products or services that contribute to availability controls:** a third party may provide products, such as network load balancing, or services, such as network monitoring, which can contribute to the service providers availability controls.
- **Consulting and advisory:** specialized suppliers who have developed expertise in availability management can help establish and develop the practice and adopt specific methods and techniques. However, availability management cannot be completely delegated to an external consultant.

Chapter 7

Capability assessment and development

7.1 The practice capability levels

The practice success factors described in section 2.4 cannot be developed overnight. The ITIL maturity model defines the following capability levels applicable to any management practice:

- Level 1** The practice is not well organized; it is performed as initial or intuitive. It may occasionally or partially achieve its purpose through an incomplete set of activities.
- Level 2** The practice systematically achieves its purpose through a basic set of activities supported by specialized resources.
- Level 3** The practice is well-defined and achieves its purpose in an organized way, using dedicated resources and relying on inputs from other practices that are integrated into a service management system.
- Level 4** The practice achieves its purpose in a highly organized way, and its performance is continually measured and assessed in the context of the service management system.
- Level 5** The practice is continually improving organizational capabilities associated with its purpose.

For each practice, the ITIL maturity model defines criteria for every capability level from level 2 to level 5. These criteria can be used to assess the practice's ability to fulfil its purpose and to contribute to the organization's service value system.

Each criterion is mapped to one of the four dimensions of service management and to the supported capability level. The higher the capability level, the more comprehensive realization of the practice is expected. For example, criteria related to practice automation are typically defined at level 3 or higher because effective automation is only possible if the practice is well-defined and organized.

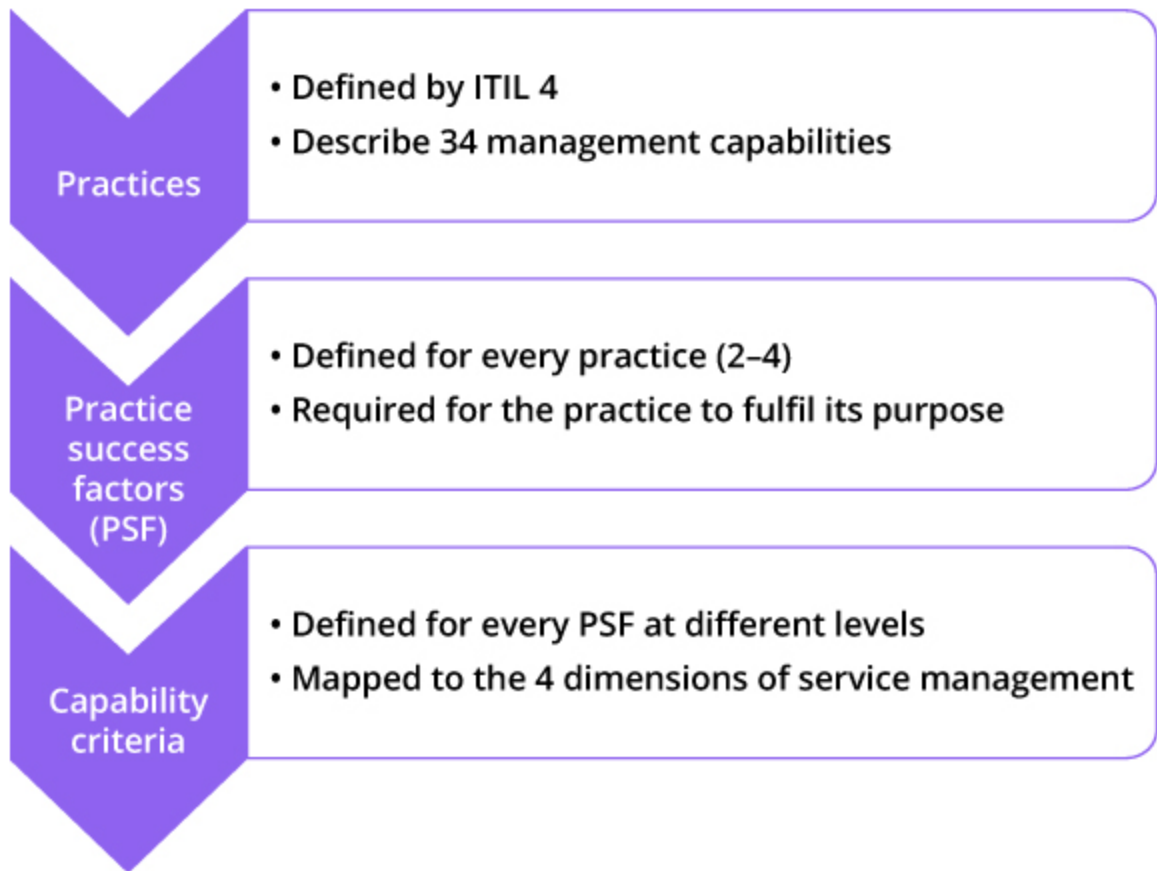


Figure 7.1 Design of the capability criteria

This approach results in every practice having up to 30 capability criteria based on the practice PSFs and mapped to the four dimensions of service management. The number of criteria at each level differs; the four dimensions are comprehensively covered starting from level 3, so this level typically has more criteria than others.

Table 7.1 outlines the capability criteria that are defined in the ITIL maturity model for the availability management practice.

Table 7.1 Availability management capability criteria

PSF	Criterion	Dimension	Capability level
Identifying service availability requirements	The stakeholders' requirements for service availability are identified	Value streams and processes	2
	The service availability requirements are analysed and addressed during product and service design, and service level negotiations	Value streams and processes	3
	The service availability requirements are translated into availability requirements for underpinning resources and services	Information and technology	3
	The service availability requirements are tracked and managed using an integrated information system	Information and technology	3
	The stakeholders' requirements for service availability are recorded and managed consistently across the organization and its services	Value streams and processes	4
	The effectiveness of the requirements identification is measured and reported	Value streams and processes	4
	The availability requirements identification is regularly reviewed and continually improved	Value streams and processes	5
Overseeing how the organization meets the defined service levels through the collection, analysis, storage, and reporting of the relevant metrics for the identified services	Service quality metrics are defined and collected for all services	Value streams and processes	2
	Service quality is reported to all relevant stakeholders	Value streams and processes	3
	Service quality metrics include the quality of internal and external underpinning services where appropriate	Partners and suppliers	3
	Service quality data is tracked and managed in an integrated information system	Information and technology	4
Measuring, assessing, and reporting service availability	Service availability is measured and reported	Value streams and processes	2
	The responsibilities for availability measurements and reporting are agreed and assigned	Value streams and processes	3
	The availability of third-party services is measured and reported	Partners and suppliers	3
	Availability measurement and reporting are automated where relevant	Information and technology	3
	The service availability measurements and reports provide information about the business impact of availability	Value streams and processes	3
	Availability measurement information is tracked and managed using an integrated information system	Information and technology	4
	The effectiveness of the availability measurement and reporting is measured and reported	Value streams and processes	4
	The effectiveness of the availability measurement and reporting is regularly reviewed and continually improved	Value streams and processes	5
Treating service availability risks	Availability risks are identified and managed	Value streams and processes	2
	The responsibilities for treating sustainability risks are agreed and assigned	Value streams and processes	3
	Availability risk controls are automated where relevant	Information and technology	3
	Partners and suppliers are involved in the management of availability risks, where relevant	Organizations and people	3
	The competencies required to manage availability risks are identified and qualified human resources are available	Organizations and people	3
	Availability risks information is tracked and managed using an integrated information system	Information and technology	4
	The effectiveness of the availability risks management is measured and reported	Value streams and processes	4
	The effectiveness of the availability risks management is regularly reviewed and continually improved	Value streams and processes	5

These capability criteria can be used by organizations for self-assessment and the improvement of the practice.

7.2 Capability self-assessment

A self-assessment can be conducted by the service provider's internal audit team, if the service provider has one, or by the respective team of the parent organization. If there is no specialized team in the organization, the assessment can be done by a team of practice owners and managers responsible for other management practices of the service provider, or a mixed team of the service provider's executive leaders and managers.

To perform a quick self-assessment using the capability criteria, the following rules should be followed.

- Start with the level 2 criteria. Based on the knowledge of the organization, answer the question, 'Is this a valid description of our organization in MOST cases?'
- If the answer to the question above is 'yes', make a list of at least three types of material evidence that could prove the answer. These can be records, documents, interviews with business stakeholders, or service provider's employees.
- If the answer is 'yes' to all criteria of level 2, this level is considered achieved. Proceed to the criteria of level 3.
- If not all criteria of level 2 are met, the practice is considered to be at level 1. Focus on the criteria that are not met; what is missing in the organization? Why? How can it affect the service consumer and the quality of the IT services? What can be done to meet the criteria that are currently missed?
- The same approach is applied at every next level; the practice is considered to be at the level where all criteria are met. It is important to focus on the missing capabilities and improvement opportunities, rather than on a formal achievement of a high capability level.

7.3 Availability management capability development

Management practices should support the achievement of the organization's objectives and enable the creation of value for stakeholders. Depending on the service provider's strategy, positioning, and business and operating models, some practices may be more important and therefore require a higher level of capability. No organization requires all management practices to be at capability level 5. A higher capability level provides higher assurance of the fulfilment of the practice's purpose, but it comes with a cost: the cost of management, automation, and training, for example. To achieve optimal performance with a sufficient level of assurance, organizations should define a target capability level for each management practice.

Figure 7.2 and Table 7.2 show the capability development model, which can be applied to every management practice. The structure of this Official Practice Guide is aligned with the development steps.

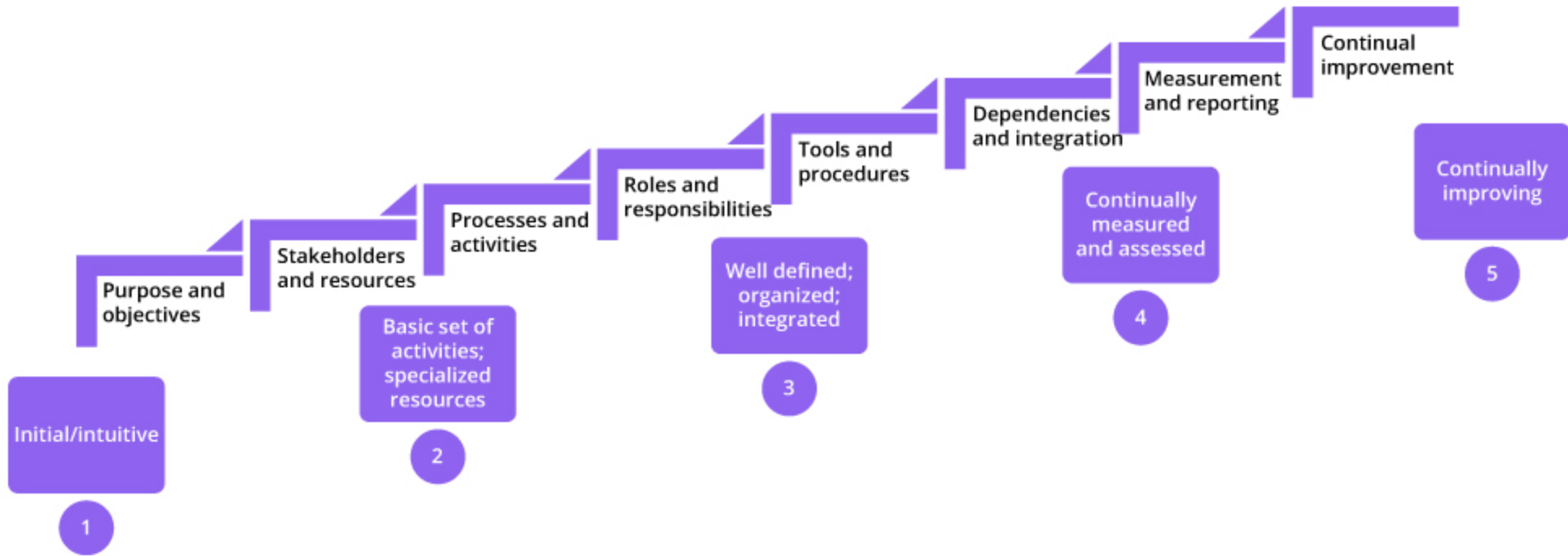


Figure 7.2 The capability development steps and levels

Table 7.2 The availability management capability development steps

Capability level	Define, agree, and implement	Comment for availability management	Chapter (for recommendations)
2	Purpose and objectives	Expectations of service consumers, regulators, and other key stakeholders	2.1
	Scope	Overlap/integration with service continuity management, risk management, and service design	2.3
	Processes and activities	Lifecycle management of availability plans and controls	3.1
	Roles and responsibilities	Roles and responsibilities	4
	Tools and procedures	Automation and information exchange	5
3	Dependencies and integration	Integration in the organization's service value streams	3.2
		Use of integrated information system	5
		Suppliers and other parties involved in availability management	6
4	Measurement and reporting	Metrics	2.5
5	Continual improvement	Regular review of practice and the availability management capability development	2.4, 2.5, 7

Chapter 8

Recommendations for practice success

Most of the content of the Official Practice Guides should be taken as a suggestion of areas that an organization might consider when establishing and nurturing their own practices. When using the content of the Official Practice Guides, organizations should always follow the ITIL guiding principles:

- focus on value
- start where you are
- progress iteratively with feedback
- collaborate and promote visibility
- think and work holistically
- keep it simple and practical
- optimize and automate.

In Table 8.1, recommendations for the success of the availability management practice are linked to the relevant guiding principles.

Table 8.1 Recommendations for the success of availability management

Recommendation	Comments	ITIL guiding principles
Ensure you understand service consumer needs and expectations	Availability management must manage a balance between availability and cost. A clear understanding of the needs and expectations of the service consumers will help to ensure that the service provider designs and manages services with just the right level of availability	Focus on value Collaborate and promote visibility Keep it simple and practical
Ensure you understand legal and regulatory requirements for service availability	Legal and regulatory requirements are non-negotiable. Ensure that all of these requirements are understood before agreeing on service availability targets, and definitely before starting designing availability controls	Focus on value Think and work holistically
Don't over-engineer availability solutions	It can be easy to get carried away and design high availability solutions that are not needed, and that increase service costs unnecessarily. The best solution is usually one that meets the requirements without adding significant costs	Focus on value Keep it simple and practical
Keep improving service availability when you can do this without significant cost	Achieving an availability target that was agreed sometime in the past may be sufficient, but service consumer expectations and market capabilities are constantly evolving. As part of continual improvement, the service provider should identify, and implement, low cost improvements to service availability even if targets are currently being met. This will help to ensure that the service remains competitive.	Progress iteratively with feedback Start where you are Focus on value
Automate availability controls where possible	Automation of availability controls will speed up response to failures and reduce the number of mistakes made. Failover between infrastructure components, and software instances, should be automated whenever this is practical and cost-effective.	Optimize and automate Keep it simple and practical Focus on value
Integrate availability management into the organization's value streams	Availability management does not create value for service consumers by itself, it needs to be integrated with many other practices to ensure that availability controls are designed, implemented, maintained, and continually improved. Integrate tools and processes for availability management with the tools and processes used for other IT service management practices, to ensure that triggers are in place and that information is shared in a timely way	Think and work holistically Collaborate and promote visibility Optimize and automate

Glossary

availability

The ability of an IT service or other configuration item to perform its agreed function when required.

four dimensions of service management

The four perspectives that are critical to the effective and efficient facilitation of value for customers and other stakeholders in the form of products and services.

information and technology

One of the four dimensions of service management. It includes the information and knowledge used to deliver services, and the information and technologies used to manage all aspects of the service value system.

ITIL continual improvement model

A model which provides organizations with a structured approach to implementing improvements.

ITIL guiding principles

Recommendations that can guide an organization in all circumstances, regardless of changes in its goals, strategies, type of work, or management structure.

ITIL maturity model

A tool that organizations can use to objectively and comprehensively assess their service management capabilities and the maturity of their service value system.

ITIL service value chain

An operating model for service providers that covers all the key activities required to effectively manage products and services.

metric

A measurement or calculation that is monitored or reported for management and improvement.

organization

A person or a group of people that has its own functions with responsibilities, authorities, and relationships to achieve its objectives.

organizations and people

One of the four dimensions of service management. It ensures that the way an organization is structured and managed, as well as its roles, responsibilities, and systems of authority and communication, is well defined and supports its overall strategy and operating model.

output

A tangible or intangible deliverable of an activity.

partners and suppliers

A tool that organizations can use to objectively and comprehensively assess their service management capabilities and the maturity of their service value system.

practice

A set of organizational resources designed for performing work or accomplishing an objective. These resources are grouped into the four dimensions of service management.

practice success factor

A complex functional component of a practice that is required for the practice to fulfil its purpose.

process

A set of interrelated or interacting activities that transform inputs into outputs. A process takes one or more defined inputs and turns them into defined outputs. Processes define the sequence of actions and their dependencies.

service provider

A role performed by an organization in a service relationship to provide services to consumers.

service provision

Activities performed by an organization to provide services and/or supply goods. Service provision includes:

- management of the provider's resources, configured to deliver the service
- ensuring access to these resources for users
- fulfilment of the agreed service actions
- service level management and continual improvement.

service relationship

A cooperation between a service provider and service consumer. Service relationships include service provision, service consumption, and service relationship management. Relationships can be basic, cooperative or collaborative (also known as a partnership).

service value system

A model representing how all the components and activities of an organization work together to facilitate value creation.

stakeholder

A person or organization that has an interest or involvement in an organization, product, service, practice, or other entity.

supplier

A stakeholder responsible for providing services that are used by an organization.

user

A person who uses services.

value

The perceived benefits, usefulness, and importance of something.

value stream

A series of steps an organization undertakes to create and deliver products and services to consumers.

value streams and processes

One of the four dimensions of service management. It defines the activities, workflows, controls, and procedures needed to achieve the agreed objectives.

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