Knowledge management
ITIL® 4 Practice Guide

AXELOS.com

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1 About this document

This document provides practical guidance for the knowledge management practice. It is split into five 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.

1.1 ITIL 4 QUALIFICATION SCHEME

Selected content from this document is examinable as a part of the following syllabuses:

- ITIL Specialist: Create, deliver and support
- ITIL Specialist: Direct, plan and improve

Please refer to the respective syllabus documents for details.

2 General information

2.1 PURPOSE AND DESCRIPTION

Key message
The purpose of the knowledge management practice is to maintain and improve the effective, efficient, and convenient use of information and knowledge across the organization.

The knowledge management practice is a way of transforming information and organizational intellectual capital into persistent value for employees and service consumers. This practice aims to provide the right information to the right people at the right moment to build an evolutionary environment where:

- absorptive capacity is continually improved
- people are eager to learn new knowledge, unlearn old knowledge, and gain and share their experience and insights
- decision-making capabilities are improved
- an adaptive change culture exists
- performance improves, supporting the organizational strategy
- data-driven and insight-driven approaches are used throughout the organization .

This is achieved by establishing integrated and systematic processes for knowledge asset management, building a high interoperability knowledge environment and empowering people to develop and share knowledge. This includes knowing and using modern technologies, data/information/knowledge management methods, approaches for training and mentoring according to the organizational vision and needs.

The knowledge management practice contributes to every component of the ITIL service value stream. This practice incorporates the following premises:

- Knowledge is processed and used in the context of value streams. This practice is integrated into value streams and ensures that information is provided effectively and on time to meet the stakeholders' expectations.
- This practice should focus on discovering and providing high-quality information (available, accurate, reliable, relevant, complete, timely, and compliant in a defined scope).

2.2 TERMS AND CONCEPTS

There are several concepts that are important for establishing an effective knowledge management practice in an organization. These concepts have been developed from scientific studies and practical management experience. The concepts are recommended for organizations aiming to increase value from the information assets that they have access to.

2.2.1 Absorptive capacity

The ability to learn is an important aspect of a person or an organization. In the case of an organization, it is enabled and limited by the organization's absorptive capacity. Absorptive capacity stands for an organization's ability to recognize the value of new information, to embed it into an existing knowledge system, and to apply it to the achievement of business outcomes. In order to be innovative and adaptive to change organizations should continually develop absorptive capacity. Absorption of new knowledge from

outside of an organization and integrating it into the knowledge system is complex and should occur simultaneously on various levels (external, organizational, teams, and individual). It should also consider the four dimensions of service management[1].

2.2.2 Data and knowledge management

To represent the relationship between data, information, knowledge, and wisdom, the data, information, knowledge, wisdom pyramid (DIKW), also known as the knowledge pyramid, is usually used. However, the divisions in the management of each of the levels are not clearly defined. The organization chooses how to name the related activities, and whether data management should be considered a part of knowledge or information management or a separate entity focused on the management of raw data. In addition, wisdom is usually vaguely described and not included in the description of structured processes. In this guide the term wisdom is not discussed, apart from implying that organizations should aim to use knowledge for value co-creation.

Organizations should define and agree the definitions and taxonomy for the knowledge management practice to gain effective outcomes. These definitions may vary depending on the type of data involved and the industry.

Valuable knowledge for decision-making may be obtained from outside of an organization, as well as from inside. This may include information from articles and posts in social and corporate media; data from surveillance and web cameras, audio recordings, and Internet of Things (IoT) devices. Much of this data is unstructured[2].

Big data management systems have emerged to work with the huge volumes of raw and often unstructured data, and to analyse it for predictive insights. Big data analytics (BDA) introduces both challenges and opportunities for knowledge management[3].

Big data is often defined by three words, known as the 3Vs of big data: volume, velocity, and variety. However, there are more Vs available, for example value, veracity, validity, and so on. The first 3 Vs are essential to understanding whether an organization is dealing with big data or more traditional forms of data.

One of the Vs is variety; which is the range of sources and the formats of the raw data, and the criteria that may impact the knowledge management practice the most as it represents the challenge that big data brings

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[1] Mikhailava, I., (2011). *Absorptive capacity: towards a practice based view*. PhD, Lancaster University Management School, Lancaster, UK.

[2] L. Uden et al. (Eds.), (2014). *Knowledge management in organizations,* Santiago: Springer International Publishing pp. 1–10

[3] Crane, Lesley & Self, Richard. (2014). Big Data Analytics: A Threat or an Opportunity for Knowledge Management? [Accesses on 28/10/2019] https://www.researchgate.net/publication/265531901_Big_Data_Analytics_A_Threat_or_an_Opportunity_for_Knowledge_Management

to the practice. A variety of sources results in both a technical challenge and a risk to the veracity and validity of the connected data.

To be able to trust the analysed information and accept potential knowledge, the techniques and algorithms used for connecting data need to be carefully verified and validated.

The value of data, information, and knowledge is determined by the outcomes that it produces for stakeholders and consumers. Knowledge does not have an intrinsic value. Knowledge should be only be considered valuable and effective when it leads to the desired outputs and outcomes. Outcomes may be assessed in terms of the organization's goals and strategy, consumer satisfaction, improved practices, and so on, depending on the context[4].

2.2.3 Knowledge assets and multi-base knowledge management environment

Organizations manage many different information assets including documents, records, databases, and so on. These assets are also connected to many external information sources with various levels of access to the information. Many of these assets and sources are specific to service management activities and are useful in an organization's development and realization of an organization's mission and strategy. Record management and the general administration of information assets are often the responsibilities of specific teams that are driven by respective practices. For example, financial records are managed as a part of the service financial management practice, and configuration records are managed as a part of the service configuration management practice.

Knowledge asset

This is an organization's specific information resource that is important for that organization's operations and value co-creation.

The knowledge management practice adds a knowledge focused view on an organization's information sources and assets. From this perspective, information assets are evaluated and managed as knowledge assets. The importance of knowledge assets can be characterized by its criticality, rarity, and appropriability:

- Critical knowledge assets have a significant impact on an organization's performance and strategy realization.
- Rare knowledge assets are hard to find and hard to replace in the event of a loss.
- Appropriate knowledge assets can be transferred from one organization to another without a significant loss in value.

The knowledge management practice aims to identify the most important knowledge assets across the organization and ensure that they are effectively managed and utilized (see section 3.2.3 for details). It is

[4] https://www.forbes.com/sites/stevedenning/2012/05/31/ten-things-you-need-to-know-about-managing-knowledge/#bf6da2d118f2 [Accessed on 28/10/2019]

also important to ensure that an organization's knowledge assets are effectively integrated into a knowledge management system, where information can be accessed and used in the most effective and efficient way.

Usually, organizations use multiple independent and dependent, internal and external data sources (databases, clouds, and so on) for knowledge management. An organization's knowledge management system should consider multiple heterogeneous, autonomous, and distributed data sources, and provide high interoperability across multiple information sources. This depends on the architecture of the information and supporting information systems (see the architecture management practice guide), but also requires agreed process and standards for information and knowledge asset management.

An organization's knowledge management system consists of knowledge assets and information management systems, including, for example, configuration management database, reports and monitoring records, tickets system storage, financial reports, and other repositories. These repositories are handled as part of the respective practices such as: portfolio management, service financial management, IT asset management, service catalogue management, and so on. These repositories are managed according to the common approach defined in the knowledge management practice to ensure high interoperability and the effective use of information across the organization.

2.2.4 SECI model of knowledge dimensions

To provide informational support for innovations and an adaptive change culture, organizations should continuously develop their absorptive capacity through creating and using new knowledge. A knowledge management models that can be used for this purpose is the SECI model[5].

The socialization, externalization, combination, internalization (SECI) model of knowledge dimension was developed by Ikujiro Nonaka and refined by Hirotaka Takeuchi. It is used to described knowledge sharing and the transformation process at any level of an organization.

The model is based on two types of knowledge, explicit and tacit:

- **Explicit knowledge** can be transferred to others, codified, assessed, verbalized, and stored. It includes information from books, databases, descriptions, and so on.
- **Tacit knowledge** is difficult to transfer to others, difficult to express, codify, and assess. It is based on experience, values, capabilities, and skills.

It also considers two dimensions for knowledge creation:

- The conversion of tacit knowledge to explicit knowledge and vice versa.
- The transfer of knowledge from an individual to groups/organizations.

The SECI model identifies four ways of how knowledge is combined, transferred, accepted, and shared.

Table 2.1 How knowledge is used according to the SECI model

Knowledge sharing type	Description	Example
Socialization (tacit to tacit).	Sharing knowledge face-to-face or through experiences, such as coaching, meetings, and so on.	A specialist could share their ideas based on his/her technical experience from previous cases with peers during an incident or problem investigation.
Externalization (tacit to explicit).	Describing the experience or formulating the process/guidelines.	A specialist documents a solution in a knowledge base article, or a manager describes a procedure for the team to follow.
Combination (explicit to explicit).	Combining, analysing, and presenting data from inside and outside an organization to form new knowledge.	A vendor's solutions are published, assessed, and adopted in the organization's solution base. ITIL best practice recommendations are adopted by the organization and included in their practice guidelines. This can be supported by large-scale databases and AI.
Internalization (explicit to tacit).	An individual develops their knowledge independently or through formal training. The development of knowledge is transformed into organizational knowledge assets.	A specialist develops his own routine by systematically following the organization's guidelines and vendor recommendations in the diagnosis and repair of a configuration item, or by attending formal training.

The use and exchange of knowledge is a continual process. Figure 2.1 includes a spiral to represent the continuity and evolution of knowledge. Knowledge sharing supports organizations and individuals by providing them with data for data-driven decisions. It also helps to accumulate, combine, and share knowledge to make insight-driven decisions.

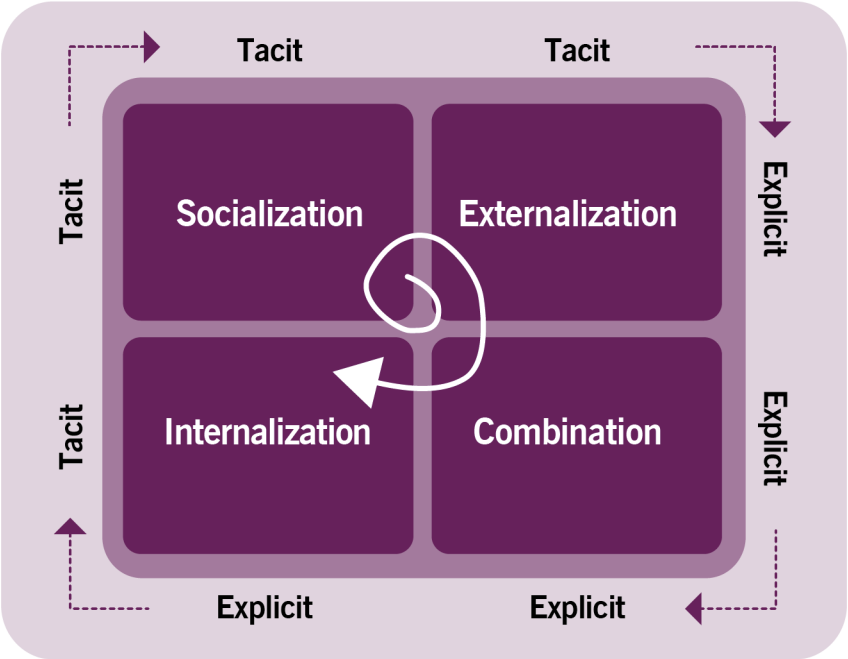

Figure 2.1 The development of knowledge sharing

2.2.5 Data-driven and insight-driven decisions

An organization's existing knowledge system is a key factor in the development of new knowledge. Data is at the core of the personal and organizational decision-making process and evolution. Yet, data is not the only source of knowledge used in decision-making. In fact, the term data-driven often implies that data equals or includes insight[6].

[6] [Accessed 30/10/2019] https://www.bts.com/blog-article/business-insight/creating-an-insight-driven-organization

If data is assembled from facts, statistics, quantities, symbols, and so on, the exclusive use of a data-driven approach may limit an organization's potential to evolve and prove to be unwise[7]. The reasons for this include:

- Data is merely a partial reflection of reality. The interpretation of the data relies heavily on an individual's experience. Different people can come to different conclusions based on the same data, or to the same conclusion based on different data.
- Any amount of data is still insufficient. There is always missing data. Sometimes the missing data is irrelevant for the decision, sometimes it is extremely important.
- Certain data needs to be interpreted by an individual who possesses the relevant expertise, and who has the motivation and ability to learn and use the data[8]. Otherwise, the data may not bring enough or any value.
- The available knowledge may limit innovations. There is a risk of functional fixedness, where the adopted patterns and context prevent individuals from acting in a creative manner. Instructions and habits may create biases about situations and objects. Many people find it hard to overcome biases, making it difficult to find new perspectives and develop innovative ideas.
- Too much overlapping or conflicting data may cause overthinking and lead to conclusions too complex or made too late. This is sometimes referred to as analysis paralysis.

Insight is the ability to gain an accurate and deep understanding of a subject. It may be interpreted as knowing and feeling the underlying nature of things. Insights are a result of human intelligence (emotions, experience, and feelings). Insights are a supplementary component of the data and are a result of an individual's experience and personality. Thus, the greater the experience and expertise of an individual, the more useful their insights will be[9]. Insights cannot be completed by artificial intelligence.

For an organization to become insights-driven they must use all four methods from the SECI model to work with knowledge and focus on both tacit and explicit information.

Techniques such as ALOE (asking, listening, observing, empathizing) and the development of emotional, social, and system intelligence, support an organization's performance and evolution[1]. (see the organizational change practice and the relationship management practice for more information.)

2.2.6 People and knowledge management

There is tremendous amount of explicit knowledge both discovered and hidden, structured and unstructured, within organizations. Nevertheless, the tacit knowledge owned by an organization is also very large. Each individual in an organization is a valuable source of information. Yet, if this tacit knowledge is not properly

[7][Accessed 30/10/2019] https://medium.com/microsoft-design/if-you-want-to-be-creative-dont-be-data-driven-55db74078eda

[8] [Accessed 30/10/2019] https://www2.deloitte.com/ca/en/pages/deloitte-analytics/articles/becoming-an-insight-driven-organization.html

[9] [Accessed 30/10/2019] https://www.forbes.com/sites/stevedenning/2012/05/31/ten-things-you-need-to-know-about-managing-knowledge/#bf6da2d118f2

managed, each time an individual leaves an organization there will be a loss of valuable knowledge, or possibly a security breach.

The knowledge management practice aims to create an environment where it will be possible to discover who knows what, who needs to know what,, how the organization may benefit from the individuals' knowledge, how to make it sharable, and how to respect the individuals' privacy. Code of conducts, ethical concerns, and inspiring people to transform tacit knowledge into explicit can support these objectives.

Key message

Dave Snowden has proposed a series of knowledge management principles that can help in dealing with employees' knowledge across the organization. They include[10]:

- Knowledge can only be volunteered; it cannot be forced.
- You cannot make someone share their knowledge as you can never measure what they know.
- We only know what we know when we need to know it.
- Human knowledge is deeply contextual and requires stimulus for recall.
- The way we know things is not the way we report we know things.
- Failure facilitates learning better than success.
- We always know more than we can say, and we will always say more than we can write down.

No matter how experienced and capable a person is their possibilities are still limited. Diverse teams build a stronger knowledge system when they cooperate and collaborate openly. The greater the team's diversity in terms of background, perspective, culture, and education, the greater the opportunity for decisive action. Generally, a homogeneous team is more efficient but less creative.

One method to increase a team's diversity is to empower social networking both inside and outside the organization. Virtual connection and knowledge exchange may help to overcome the limits caused by location, organizational structure, and culture.

Social networks may be used as one of the tools to support the knowledge management practice and collaboration inside and outside an organization. It also can be supported by mobile technologies, sensors, and notification systems to build systems of awareness. For example, smart offices where a screen shows the location of other employees and if they are available for a meeting with a colleague[11]. Social networks help to create communities of knowledge or practices, that may improve knowledge exchange within teams and organizations. Social networks also reveal the knowledge that an individual possesses and who can be approached in each situation.

When building social networks and engaging people in the knowledge management practice, it is vital to consider ethical concerns and the risk of interruptions caused by the exposure of knowledge. (For more information about ethics please see section 3.2.1.1 of *ITIL® 4: High Velocity IT*

[10] [Accessed 30/10/2019] https://cognitive-edge.com/blog/rendering-knowledge/

[11] [Accessed 30/10/2019] http://files.gk-facfil.webnode.com/200000004-ecf7fedf15/groth-ecscw03-ws.pdf

2.2.7 Organization learning and knowledge management

Nowadays, individuals do not stay in a specific role for very long as there is a lot of horizontal movements between roles, and career choices are not always connected to an individual's professional education. To develop absorption capacity, organizations should also have a continual process of learning and capabilities development. This is possible through empowering people to identify and build on their skills to make their own job meaningful and value driven.

The knowledge management practice together with the workforce and talent management practice aim to motivate and facilitate employees to discover new, develop, enhance, and better use their capabilities. The learning capabilities of an organization should be driven by business needs, values, and priorities. Learning in an incremental and agile way is important for modern development teams. It may be beneficial to transition from an annual training calendar, to scheduling training and development programmes when required. In relation to training, organizations should also prioritize competencies for effective knowledge usage. Employees should be taught to discover and process information in the most efficient and valuable way.

Even when the most modern technologies and digital inventions are used for the knowledge management practice, there is still a risk that critical data will be underutilized due to the lack of skills in processing and managing the information. These skills need to be developed as they do not emerge alongside the fast evolution of data management technologies.

2.2.8 Consumers and knowledge management

There are at least two perspectives when considering a service consumers' involvement in the knowledge management practice: consumers as participants and requestors of knowledge management activities; and a consumers' organizations as a source of information for the service provider.

The integration of technology between service consumers and service providers creates an immense amount of unstructured and structured data in operational activities. This data, if used properly, has a potential to maximize stakeholders' value, improve organizations' performance, increase meaningful user and customer journeys, and strengthen enduring relationships. For example, the analysis of information requested by users can help organizations identify areas where the user journey may be improved or identify areas for additional training or instruction.

Relationships between service consumers and service providers may involve various levels of integration and formality (see Table 3.1 of ITIL Foundation for more information about relationships between organizations). Whether or not a service consumer's representatives are directly involved in the service provider's knowledge management activities depends on the level and form of the service relationship.

The knowledge management practice together with the portfolio management, strategy management, and service level management practices aims to design methods that will be used to capture, store, access, and analyse data regarding service consumers to improve sales, consumers retention, and engagement. (For more information about the service consumers' journey please see DSV.)

2.3 SCOPE

The knowledge management practice supports all value streams and can be used with any other practice as they all create and use data and knowledge. The knowledge management practice includes data/information/knowledge collection, research, processing, analysis, improvement, presentation, and technical assistance. This practice is also aligned with training, skills development, learning, as well as innovation and research initiatives. The scope of the knowledge management practice includes:

- Establishing an organization wide environment for effective information exchange and knowledge management, including culture, techniques and procedures, and tools and skills.
- Understanding knowledge assets and providing recommendations for their effective management and use.
- Monitoring and improving effectiveness of knowledge use across the organization.
- Discovering and providing information on demand, where no readily available knowledge is available.

Table 2.2 Activities related to the knowledge management practice that are described in other practice guides

Activity	Practice guide
Knowledge assets use, processing and management	All other practices
Knowledge management methods and tools application	All other practices
Defining organization's requirements for knowledge management	Strategy management Risk management Workforce and talent management Relationship management Organizational change management Portfolio management Service catalogue management Service configuration management
Implementation of knowledge management methods and tools at all levels of the organization	Relationship management Organizational change management Workforce and talent management Strategy management Continual improvement Project management

Change of IT infrastructure related to the knowledge management digitization	Change enablement Release management Business analysis Deployment management Software development and management Service validation and testing Portfolio management Service catalogue management Service configuration management
Knowledge risks assessment and control	Risk management
Costs control, financial evaluation of knowledge related activities	Service financial management
Managing access to data, information and knowledge in compliance to security requirements	Information security management
Automation of data storage, transfer, archiving	Infrastructure and platform management Software development and management

2.4 PRACTICE SUCCESS FACTORS

Practice success factor (PSF)

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

A practice success factor (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 knowledge management practice includes the following PSFs:

- The creation and maintenance of valuable knowledge and its transfer and usage across an organization.
- The effective use of information for enabling decision-making across an organization.

2.4.1 Creation and maintenance of a culture of effective sharing and the application of valuable knowledge across the organization

The culture of effective knowledge sharing and application is a system of beliefs, attitudes, values, and expectations shared by people in an organization about knowledge, including data and information. It determines the people' ability to identify, understand, use, analyse, learn, unlearn, transfer, present, and discuss information in a way that supports an organization's vision and strategy.

The knowledge management practice describes techniques and tools that can only be effective when used within the correct cultural context, in the correct way, at the right moment, and with commitment from the stakeholders. The knowledge management practice culture varies between organizations and may be a source of a competitive advantage. When developing a knowledge transfer strategy and culture, an organization should find a way to overcome each of these barriers according to its needs.

The culture of knowledge transfer can be established by stressing the value and importance of sharing knowledge and creating an open atmosphere both within and across the teams. In essence, an organization must create a work environment that encourages people to:

- to ask questions
- to challenge existing knowledge and consider alternative perspectives
- to hear others and be heard
- to learn and unlearn
- to increase intelligence in the areas where needs have been identified (conversational, emotional, social, intrapersonal, interpersonal, and so on)
- to help people overcome their fear of punishment due to their mistakes
- to help people overcome their fear of judgement when asking or documenting data
- to help people overcome their worry about being replaced if they share knowledge
- to set a priority for sharing knowledge in a complicated operational routine (due to a lack of time or meeting places for sharing).

This change in culture will not only impact internal relationships but will also affect cooperation with service consumers, partners, and suppliers.

It is important to use such practices as workforce and talent management, organizational change management, relationship management, strategy management, continual improvement management, and supplier management to assist the knowledge management practice with establishing a culture of effective knowledge sharing and application.

2.4.2 Enabling effective information support for decision-making across an organization

The knowledge management practice includes the identification and usage of methods and tools to create a knowledge management system to support decision-making across the organization. Organizations that are more successful in implementing the knowledge management practice develop both technology and people-oriented aspects (like developing a learning culture and focusing on the competencies to use, collect, and share information throughout the organization).

According to surveys results[12] there are three important areas where information systems should be used to improve decision-making:

- getting the right information at the right time
- ensuring access to information in multiple places (location, means, and time)
- sending instant alerts when things go wrong.

The quality of information is also vitally important for the knowledge management practice. There are several factors which affect the quality of information, that should be considered when designing and maintaining knowledge management systems[13]:

- errors in the information collected (for example customers or employees enter inaccurate data, service desk agent enter incomplete data to save time), data collection design (for example asking the wrong questions or the wrong respondents)
- information from different external and internal systems are not aligned in the entry standards and format
- poor system design which causes information loss
- potentially valuable information is not shared and is lost in an organization's unstructured data
- loss of information in the migration from one system to another
- loss of information in poorly integrated systems
- ineffective presentation or hard to use interfaces

Information about the past is available through databases, web-based resources, and other data sources. To predict the future, those making decisions should rely on an insight-based approach, which uses intuitive and

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[12] Xu J., Quaddus M. (2013) Using Information Systems for Supporting Decision Making. In: Managing Information Systems. Atlantis Press, Paris

[13] Mayer & Schaper 2010; Chui & Fleming 2011; Bloomberg Businessweek Research Services 2011

Milley & Wood 2010; Haag, Baltzan & Phillips 2008, p. 388

Information Systems that Really Support Decision-Making by Gio Wiederhold, Journal of Intelligent Information Systems March 2000, Volume 14, Issue 2–3, pp 85–94

creative thinking, combined with forecasting tools and intelligent data analysis. These tools may also assess the effects of alternative decisions.

The knowledge management practice is crucial for the shift-left approach, that can support, for example, the incident management, service request, service validation and testing, and release management practices. Within these practices the knowledge management practice is an input for the shift-left approach.

The knowledge management practice should identify improvement opportunities for the knowledge management system, processes, tools, or other resources, with the aim of improving the practice and the associated stakeholders' experience.

It is important to ensure that improvements are not only initiated but also effectively implemented. An approach to implementing improvement is described in the continual improvement practice guide. It is also important to use multiple practices in the context of value streams to maintain the momentum of continual improvement.

2.5 KEY METRICS

The effectiveness and performance of the ITIL practices should be assessed within the context of the value streams to which each practice contributes. As with the performance of any tool, the practice's performance can only be assessed within the context of its application. However, tools can differ greatly in design and quality, and these differences define a tool's potential or capability to be effective when used according to its purpose. Further guidance on metrics, key performance indicators (KPIs), and other techniques that can help with this can be found in the measurement and reporting practice guide.

Key metrics for the knowledge management practice are mapped to its PSFs. They can be used as KPIs in the context of value streams in order to assess the contribution of the practice to the effectiveness and efficiency of those value streams. Some examples of metrics are given in Table 2.3.

Table 2.2 Examples of key metrics for the practice success factors

Practice success factors	Key metrics
Creation and maintenance of culture of valuable knowledge transfer and usage across the organization	Compliance of the knowledge management practice culture with formally stated requirements
	Stakeholders' satisfaction with the knowledge management practice culture adoption and acceptance
	Absorption capacity
	Adoption of the knowledge management practice across the organization
Enabling effective informational support for decision-making across an organization	Stakeholder satisfaction with the informational support for decision making
	Compliance of information with formally stated requirements, according to audit reports
	Information quality (accuracy, completeness, consistency, uniqueness, and timeliness)
	Knowledge management tools effectiveness
	Users' satisfaction with knowledge management tools

There are several methods for measuring an organization's intangible assets which can be applied to the knowledge management practice[14].

The correct aggregation of metrics into complex indicators will make it easier to use the data for the ongoing management of value streams, and for the periodic assessment and continual improvement of the knowledge management practice. There is no single best solution. Metrics will be based on the overall service strategy and priorities of an organization, as well as on the goals of the value streams to which the practice contributes.

[14] [Accessed 30/10/2019] https://www.researchgate.net/publication/270092694_Knowledge_Management_Metrics_A_Review_and_Directions_for_Future_Research

3 Value streams and processes

3.1 VALUE STREAM CONTRIBUTION

Like any other ITIL management practice the knowledge management practice contributes to multiple value streams. It is important to remember that a value stream is never formed from a single practice. The knowledge management practice combines with other practices to provide high-quality services to consumers. The main value chain activities to which the practice contributes are:

- improve
- deliver and support.

The contribution of the knowledge management practice to the service value chain is shown in Figure 3.1.

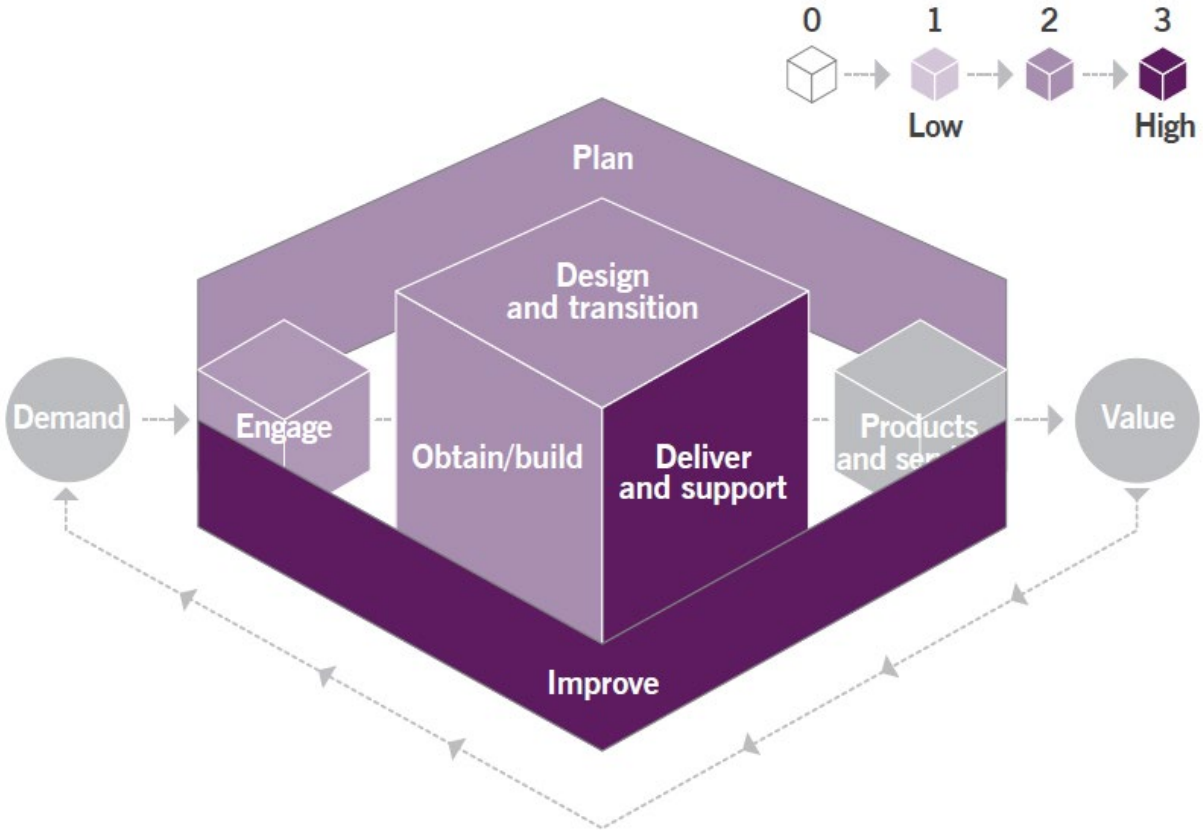

Figure 3.1 The contribution of the knowledge management practice to the service value chain

3.2 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.

Knowledge management activities form three processes:

- establishing and maintaining the four dimensions of service management
- on demand information discovery
- information model management and integration

3.2.1 Establishing and maintaining the knowledge management environment and four dimensions of service management

The process ensures the existence and improvement of the environment where all stakeholders understand the nature of knowledge and are willing to create, use, and transfer it[15]. The process is focused on:

- changing obsolete patterns of knowledge usage
- building and the continual improvement of the organizational culture that enables valuable knowledge usage and transfer
- empowering the learning environment within an organization
- continual improvement of knowledge management practice in general
- identifying the knowledge asset within an organization
- identifying the way to create and transfer knowledge and manage knowledge assets (tacit to explicit, structured and unstructured).

When developing the principles of the knowledge management practice culture and building the knowledge management capabilities, an organization should consider all four dimensions of service management as well as external factors. (See *ITIL® 4: Foundation Edition* Chapter 3 for more information.)

[15] [Accessed 30/10/2019]
https://www.researchgate.net/publication/235320642_Doing_knowledge_management

Table 3.1 Inputs, activities, and outputs of nurturing organizational culture of knowledge usage and sharing process

Key inputs	Activities	Key outputs
Knowledge management stakeholder's satisfaction assessment Previous improvement results Policies and regulatory requirements Financial guidelines and constraints Improvements proposals from relationship, workforce and talent management practices, organizational change, other practices Risk information	Understand current culture of knowledge usage and knowledge sharing Review external and internal requirements and factors of influence Optimize response, identify improvements Promote and empower usage of knowledge management practice across the organization Review knowledge management practice application and initiate improvements	Knowledge Management approach Scope of Knowledge management assets knowledge management practice improvement plan Templates, instructions and guidance for knowledge management lifecycle management Recommendations and approach for knowledge system building and maintenance Data and information quality guidelines Change requests Requirements and information for organizational change management, workforce and talent management, relationship management Materials for knowledge management trainings and learning environment empowerment

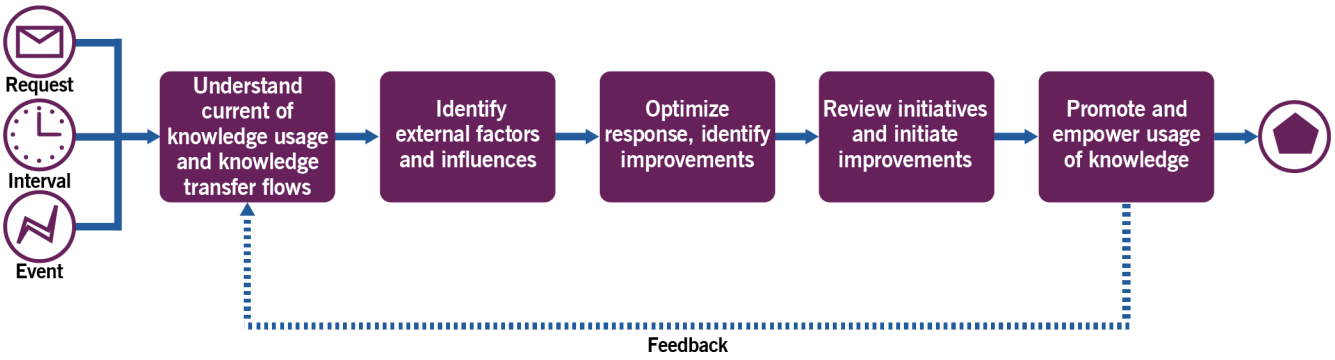

Figure 3.2 Workflow of Establishing and maintenance of knowledge management environment

Table 3.2 Example of activities for management of nurturing organizational culture of knowledge usage and sharing process

Activity	Example
Understand current culture of knowledge usage and knowledge sharing	Knowledge manager together with management team, service owners, and others relevant to the stakeholders review and analyse: ● Organizational information and knowledge flows ● Results and progress of knowledge management practice improvement and requests for knowledge management improvement from other practices ● Employees, customers, and partners satisfaction ● Other information that may help to understand if the organization knowledge management is up to date and meets the needs of the organization This is done regularly (interval-based, for example once or twice per year) or as a response to a significant change of the inputs (event-based). The knowledge manager with the support of the management team nominates people and assigns the roles of the knowledge management team members.
Review external and internal requirements and factors of influence	The knowledge manager and knowledge management team members continually review and analyse: ● External factors that impact knowledge system ● Available emerging practices for data, information and knowledge management

	• Requirements and recommendations for knowledge management for relevant industries (like GDPR, ISO 30401, ISO 900, and so on) • Data analysing techniques and methods • Other valuable information for supporting a knowledge sharing environment
Optimize response and identify improvements	Based on the outputs of the previous steps, the knowledge manager together with the knowledge management team members should identify the optimal response of the knowledge management approach to organizational strategy. (It is important to keep in mind that not all best practices and new approaches should be implemented and used immediately. The organization should only use those that suits its vision.)
Review initiatives and initiate improvements	The knowledge manager reviews the practice and registers all of the required and identified knowledge management related to the improvement initiatives via the continual improvement register. The relevant members of the organization processes it with the involvement of the continual improvement practice.
Promote and empower usage of knowledge management practice across the organization	The knowledge manager and knowledge management team members create relevant guidance, training materials (text, videos, podcasts, and so on), and share information via the relevant channels, conduct training, and support organization members in their knowledge management activities. Information about adoption of the promoted patterns and stakeholders' satisfaction is used as input for the process.

3.2.2 On-demand information discovery

This process focuses on the discovery and provision of new information in response to unusual and non-routine requests. It requires extra effort and competencies in the investigation and integration of findings into an organization's knowledge system. This process is used when a unique or rare request for information is raised, and the information requested cannot be obtained via the available information systems and patterns. Examples of scenarios where this process is used include:

- non-standard business analysis to validate a hypothesis
- assessment of emerging technology or business practice
- assessment of other external influences, such as new regulations
- complex requests that are rare, and therefore have not been standardized or automated.

The process supports these knowledge needs by accessing resources and the people with the required information inside and outside the organization.

Table 3.3 Inputs, activities, and outputs of the management of informational support for specific area

Key inputs	Activities	Key outputs
Information request Access to internal and external sources of information Information security policies Financial guidelines and constraints Policies and regulatory requirements	Registration of information request Research and data collection Information processing and presentation Information acceptance Knowledge integration and review	A set of information in requested format Updated internal knowledge storages Information usage reports

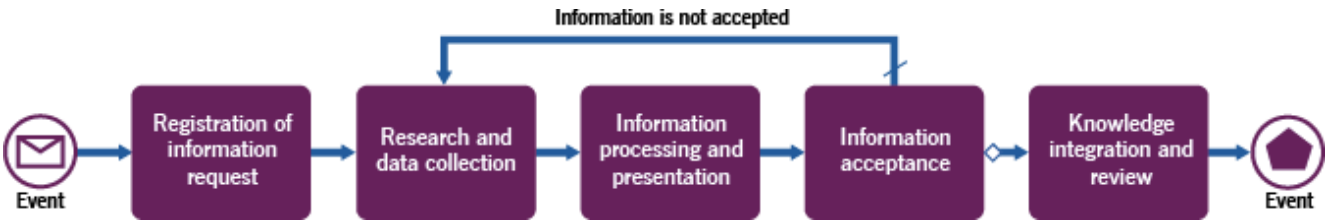

Figure 3.3 shows a workflow diagram of the on-demand information discovery process.

Table 3.4 Activities of the on-demand information discovery process

Activity	Example
Registration of information request	The knowledge manager or assigned knowledge management team member accepts information request in agreed format (usually includes: area of information, purpose of requested information, currently available sources, requested format, timing, and so on)
Research and data collection	The knowledge manager or knowledge management team member identifies roles and people that are likely to be involved in the research and assigns (or requests resource allocation) them to work on the request. Assigned specialists and analysts: Agree on time that they devote for the research and expected outputs of the research. Agree on data selection criteria Obtain and review available data and information according to the requested area and purpose in internal and external sources, in accordance with the agreed procedures and constraints Interview people and support tacit-to- explicit knowledge transfer
Information processing and presentation	Assigned members of the knowledge management team analyse and structure the collected data and presents it in the agreed format. Resulting outputs are provided to the agreed group of stakeholders.

Information acceptance	Agreed stakeholders (information requester and/or other intended recipients) review the research output and confirm acceptance, including: • information quality • outputs format • timeliness of the presentation. If the information is not accepted, the request can be returned to research step of the processed, or cancelled (if not relevant anymore, or cannot be viably fulfilled).
Knowledge integration and review	Accepted information is reviewed to assess opportunities for integration into organization's knowledge management systems. Based on the assessment results, the information may be: • Stay in exclusive possession of the intended recipients (unique one-off requests, or classified information) • Integrated into an organization's knowledge management system and published (subject to classification and access policies) A decision to standardize the information request and make the information available on a permanent basis can be initiated (to be assessed and acted upon using the process of establishing and maintenance of knowledge management environment described in section 3.2.1.

3.2.3 Knowledge asset management

The process is focused on the management of knowledge assets throughout their lifecycle and the effective integration of the knowledge asset into an organization's knowledge management practice environment. Knowledge assets may represent the collective and individual, structured and unstructured, tacit and explicit data and information. Examples include incidents records, applications source code, service level agreements, technical documentation, and so on. The scope and level of specification of knowledge assets are defined as part of the 'establishing and maintenance of knowledge management environment' process in conjunction with architecture management, information security management, service configuration management and other practices.

Table 3.5 Inputs, activities, and outputs of knowledge assets management

Key inputs	Activities	Key outputs
Information assets used by the organization Information security policies Data and information quality guidelines Information about errors in knowledge system Stakeholders feedback and satisfaction data	Knowledge asset discovery Knowledge assets analysis and classification Development of knowledge asset management guidelines Guideline assignment and communication Knowledge asset management assignment acceptance Knowledge asset review and improvement initiation	New and updated knowledge assets Knowledge assets management guidelines Knowledge asset management assignments Knowledge asset management reports

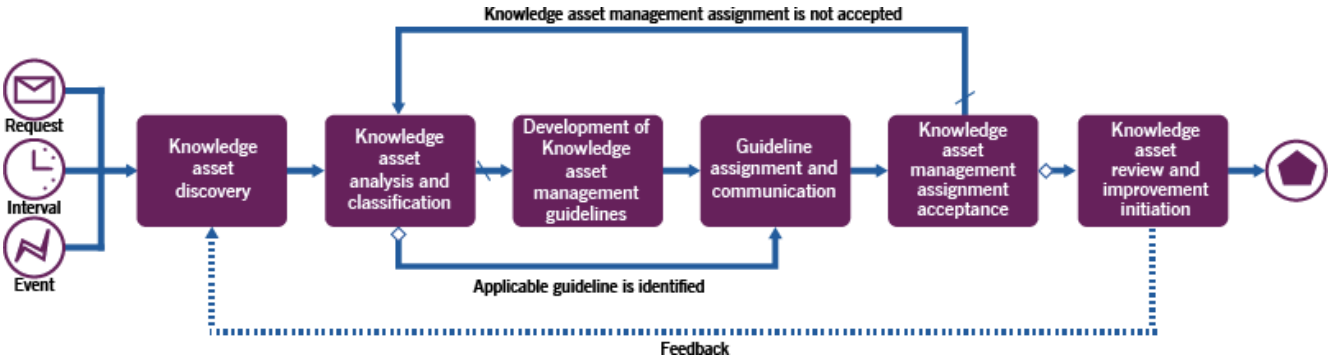

Figure 3.4 Workflow diagram of the knowledge asset management process

Table 3.6 Activities of the knowledge asset management process

Activity	Examples
Knowledge asset discovery	The knowledge manager and members of the knowledge management team analyses the information assets of the organization. This activity is performed regularly, or can be triggered by: • introduction of new information assets • feedback of knowledge users • knowledge asset management review findings • request from a stakeholder. Information about new or changed knowledge assets is passed to relevant team members for analysis and classification.
Knowledge assets analysis and classification	Assigned members of the knowledge management team evaluates the importance of the knowledge assets and identifies the appropriate management guidelines and the responsible team or role to assign the knowledge asset management responsibilities to. If no applicable guideline has been identified (in case of new type of knowledge asset discovery or because the guideline library is incomplete), the development of a new management guideline is initiated.
Development of knowledge asset management guidelines	The knowledge manager is assisted by relevant specialists who develop the guidelines for the management of the newly discovered knowledge asset. This includes assessment of the applicable policies. Wherever possible, available guidelines are reused. Agreed guidelines should include recommendations on

	who should take responsibility for the management of the information asset. When a guideline is agreed, it is assigned to the appropriate team or person to manage the information assets.
Guideline assignment and communication	When applicable guideline is identified, it is assigned to appropriate team or person to manage the information assets.
Knowledge asset management assignment acceptance	The specialist team or person reviews the assignment and accepts or rejects it. Rejections should be explained in enough detail to facilitate reanalysis and re-assignation. If the assignment is accepted, the team or person responsible for the management of the information asset follows the guideline as part of their usual work in the context of value streams and practices where the information asset is used.
Knowledge asset review and improvement initiation	The knowledge manager performs a review of the information asset management to assess the applicable key metrics of the practice and initiate improvements in the information asset management process and the practice in general. Improvement initiatives are communicated to the relevant stakeholders and managed through the continual improvement practice.

4 Organization and people

4.1 ROLES, COMPETENCIES, AND RESPONSIBILITIES

The practice guides 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 (IT) expertise and conducting expertise-based assignments

4.1.1 Knowledge manager

The knowledge manager role can be performed by a dedicated person or the responsibilities can be taken by the person or team responsible for the specific knowledge management practice area and is capable enough to coordinate it efficiently.

The role of the knowledge manager should focus less on coordinating and completing actions through knowledge asset management, but rather to create a knowledge management culture and competencies for the organization's evolution.

The role is typically responsible for:

- coordinating the knowledge management culture and capabilities building process
- defining and assigning knowledge team roles
- ensuring that the knowledge asset management process is known and run in relevant SVS parts according to the organizations structure, strategy, and needs
- empowering, mentoring, and leading the knowledge team
- formally communicating decisions through the knowledge management practice lifecycle to the stakeholders and affected parties
- monitoring and reviewing the activities of the teams that are involved in the knowledge management practice
- conducting regular and ad hoc practice analyses, and initiating improvements to the practice, procedures, used methods, and tools
- developing the organization's expertise in the methods and approaches for the knowledge management practice
- creating an environment permeated by psychological safety, mutual respect, and trust where employees choose to learn, unlearn, use and share knowledge in agreed way
- holding the knowledge team accountable and empowering commitment.

The competency profile for these roles is LACMT, though the importance of each of these competencies varies from activity to activity. Examples of the roles which can be involved in knowledge management activities are listed in Table 4.2, together with the associated competency profiles and required skills.

4.1.2 Knowledge management team

The knowledge management team is a team of people with different competencies who work together and lead the knowledge management practice to achieve the desired outcomes. The shared leadership is a set of shared practices that should be executed by people at all levels of the organizational structure. The role can be assigned to people all over an organization depending on their experience, competencies, and according to a specific project/process/task.

The knowledge management practice team together with the knowledge manager are responsible for the definition, communication, and execution of the knowledge management strategy, plans, and guidelines. It is expected that the knowledge management team will apply its ingenuity and contribute ideas and efforts to the effective knowledge management practice across the organization.

4.1.3 Other roles involved in organizational knowledge management activities

Table 4.3 Examples of roles with responsibility for organizational knowledge management activities

Activity	Responsible roles	Competency profile	Special skills
Establishing and maintenance of knowledge management environment			
Understand current culture of knowledge usage and knowledge sharing	Knowledge manager Management team HR director and team Service owner Product owner Relationship manager Supplier manager	CAT	Knowledge and understanding of an organization's strategy and structure. Knowledge of the services and products Analytical skills.
Review external and internal requirements and factors of influence	Knowledge manager Management team HR team Information security team Product owner Service owner	AC	Knowledge of data management methods, BDA trends, other knowledge management related information. Information processing Analytical skills
Optimize response, identify improvements	Knowledge manager Risk manager Information security manager Financial manager Service owner	AMCT	Knowledge of an organization's strategy, structure, and goals Understanding of the knowledge management methods and tools

	Product owner Relationship manager Supplier manager		Knowledge of the services and products
Review initiatives and initiate improvements	Knowledge manager Knowledge management team Continual improvement manager Organizational change manager HR manager	AMC	Knowledge of social networks communication methods Presentational skills Mentoring, consultancy, and coaching Knowledge of conversational intelligence and nonviolent communication methods
Promote and empower usage of knowledge management practice across the organization	Knowledge manager Management team Service owner Product owner HR team	CL	Knowledge of continual improvement method
On-demand information discovery			
Registration of information request	Knowledge manager Knowledge management team	TA	Understanding of knowledge management practice and registration procedures

Research and data collection	Knowledge management team Product owner Service owner Relationship manager Supplier manager Business analyst Technical specialists	ATC	Knowledge of data research and analysis methods
Information processing and presentation	Knowledge management team Product owner Service owner Relationship manager Supplier manager Business analyst Technical specialists	ACT	Analytical skills Presentational skills Knowledge in a related to a request area
Information acceptance	Any role in the organization	TA	Understanding of the purpose and context of the information request Analytical skills
Knowledge integration and review	Knowledge manager Knowledge management team Service owner Product owner Configuration manager Risk manager	MTC	Analytical skills Understanding of knowledge management practice Knowledge and understanding of organization's strategy and structure.

	Information security team		
Knowledge assets management			
Knowledge asset discovery	Knowledge manager Knowledge management team	AT	Good knowledge of the organization's informational environment, analytical skills
Knowledge assets analysis and classification	Knowledge manager Knowledge management team Service owner Product owner Configuration manager Risk manager Information security team	AT	Good knowledge of the knowledge management guidelines and procedures Analytical skills
Development of knowledge asset management guidelines	Knowledge manager Knowledge management team Service owner Product owner Configuration manager Risk manager Information security team	ACT	Good knowledge of the knowledge management guidelines and procedures Analytical skills Good knowledge of the organization's management practices, organizational structure and responsibilities Communication skills
Guideline assignment and communication	Knowledge manager Knowledge management team	C	Communication skills Good knowledge of organizational structure and responsibilities

Knowledge asset management assignment acceptance	Any specialist or manager role in the organization	AT	Analytical skills Good knowledge of own and related responsibilities and associated roles Knowledge of the products, services and information resources
Knowledge asset review and improvement initiation	Knowledge manager Service owner Product owner Configuration manager Risk manager Information security manager	ATMC	Good knowledge of the knowledge management guidelines and procedures Analytical skills Good knowledge of the organization's management practices, organizational structure and responsibilities Communication skills

4.2 ORGANIZATIONAL STRUCTURES AND TEAMS

The knowledge manager role may be associated with a formal job title but it is common practice to have a dedicated person within an organization who oversees the knowledge management practice. However, such structures are more likely to be found in larger organizations with a complex management system or where the knowledge management practice is mature and the importance of the knowledge assets are recognized.

Formal teams for the practice may include a knowledge management team and temporary teams assigned for a specific knowledge management activity or project. The most common and effective practice is to identify the people responsible for the knowledge management practice in every team: product, functional, or management. The knowledge management practice should be integrated into every activity and every practice, instead of being kept isolated within a dedicated formal structure.

5 Information and technology

5.1 INFORMATION EXCHANGE

- The effectiveness of the knowledge management practice is based on the quality of the information used. This includes, but is not limited to, information about: organizational strategy and values organizational structure
- knowledge management methods and tools
- services and their architecture
- partners and suppliers
- policies and requirements which regulate organizational structure
- requested knowledge, including:
  - expected benefits for the employees and the organization as whole
  - estimated time and cost of information and knowledge research, use, share
- regulations affecting the information and knowledge stakeholder satisfaction with the practice.

This information may take various forms. The key inputs and outputs of the knowledge management practice are listed in section 3.

To avoid losing valuable knowledge through organizational changes and onboarding/offboarding new customers, employees, and partners organizations should consider the knowledge management practice as an important participant through OCM, customer journey, and supplier management.

5.2 AUTOMATION AND TOOLING

Data science technology, software platforms, virtual reality, artificial intelligence, machine learning, IoT (internet of things), and other new approaches continually evolve to leverage knowledge management strategies.

In most cases, the work of the knowledge management practice can significantly benefit from automation. This may involve the solutions outlined in Table 5.1 when automation is both possible and effective.

Table 5.1 Automation solutions for organizational change management activities

Process activity	Means of automation	Key functionality	Impact on the effectiveness of the practice
Establishing and maintenance of knowledge management environment			
Understand the current culture of knowledge usage, and knowledge sharing	Social software, analytical and reporting tools Talent management and HR tools Knowledge search tools Knowledge visualization tools	Data analysis, information presentation, and sharing.	High, especially in a big size organization with complex structure
Review external and internal requirements and factors of influence	Knowledge search tools Data Science Techniques Big data tools External analytical portals and libraries Social software (including platforms for experience exchange between organizations) Legal information portals	Collecting best practices, new approaches, requirements, and other information outside the organization	High
Optimize response, identify improvements	Analytical and solution modelling tools Knowledge visualization tools	Data analysis, decision making and presentation to stakeholders	Medium

Review initiatives and initiate improvements	Knowledge visualization tools Social software Communication tools	Information presentation and sharing through organization	Medium to high, especially in a big size organization with complex structure
Promote and empower usage of knowledge management practice across the organization	Project management tools, communication systems, collaboration systems	Communicating, and initiating improvement actions	Medium to high, especially in a big size organization with complex structure
On-demand information discovery			
Registration of information request	Ticketing and workflow systems, knowledge search tools	Enabling and controlling knowledge management process workflow; prioritization of backlog and workflow management; workflow visualization	High, especially for large volumes of requests for information support
Research and data collection	Knowledge search tools Content repositories Decision support tools Big data tools Data Science Techniques External analytical informational portals and libraries External professional social networks legal information portals	Enabling data research, efficient choice and collection	Very high
Information processing and presentation	Knowledge visualization tools	Formalization and structuring research	High, especially for large volumes of

	Decision support tools Data analytics tools	results in a requested format. Presenting outputs to stakeholders	requests for information support
Information acceptance	Ticketing and workflow systems	Enabling efficient way to get feedback from stakeholder. Quick and traceable remote acceptance/rejection of information	Low to medium
Knowledge integration and review	Content repositories Knowledge search tools Knowledge visualization tools Social software Communication tools	Integrate new information and knowledge into existing knowledge system and communicate changes to stakeholders	High, especially for large volumes of requests for information support
Knowledge assets management			
Knowledge asset discovery	Content repositories Knowledge search tools Knowledge visualization tools Social software	Review and find requested knowledge asset	Very high
Knowledge assets analysis and classification	Content repositories Knowledge search tools Knowledge visualization tools Social software	Create, add, update knowledge asset	Very high
Development of knowledge asset management guidelines	Knowledge visualization tools,	Analysis, formalization and structuring of knowledge assets	High

	Decision support tools Data analytics tools Knowledge visualization tools		
Guideline assignment and communication	Knowledge visualization tools, Social software Communication tools	Presenting outputs to stakeholders	Medium to high especially for organizations with complex structure and/or large volumes of knowledge flows
Knowledge asset management assignment acceptance	Ticketing and workflow systems	Enabling efficient way to get feedback from stakeholder. Quick and traceable remote acceptance/rejection of information	Low to medium
Knowledge asset review and improvement initiation	Content repositories Knowledge search tools Knowledge visualization tools Social software	Knowledge assets usage in a right moment in a convenient way	High

6 Partners and suppliers

Very few services are delivered using only an organization's own resources. Most, if not all, depend on other services. These are often provided by third parties (see section 2.4 of *ITIL® Foundation: ITIL 4 Edition* for a model of a service relationship).

An organizations' absorption capacity increases both from involving suppliers to enable the knowledge management practice activities and from recognizing partners as a source of information (even those suppliers and partners who are not related to the practice's support function). Information and knowledge exchange are vital for any actions and where it interacts and cooperates with external stakeholders in the SVS.

Related risks should be considered when planning the cooperation and knowledge sharing interfaces with partner organizations. For example, the risk of losing expertise. Any activity outsourced to a partner organizations results in the loss of key in-house expertise and knowledge. Yet, to mitigate this risk an organization should include knowledge management practice actions with partners in onboarding/off-boarding procedures.

Where organizations aim to ensure fast and effective knowledge management practice, they usually try to agree to close cooperation with their partners and suppliers, removing formal bureaucratic barriers in communication, collaboration, and decision-making. All parties in such relationships should aim for mutual transparency and visibility of the changes that may affect the other parties (see the supplier management practice guide for more information).

7 Important reminder

Most of the content of the practice guides should be taken as a suggestion of areas that an organization might consider when establishing and nurturing their own practices. The practice guides are catalogues of topics that organizations might think about, not a list of answers. When using the 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.

More information on the guiding principles and their application can be found in section 4.3 of *ITIL® Foundation: ITIL 4 Edition*.

8 Acknowledgments

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