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Systems and software engineering — Requirements for managers of information for users of systems, software, and services

Ingénierie des systèmes et du logiciel — Exigences pour les gestionnaires de l'information pour les utilisateur de systèmes, logiciels, et services

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Institute of Electrical and Electronics Engineers, Inc
3 Park Avenue, New York
NY 10016-5997, USA

Email: stds.ipr@ieee.org
Website: www.ieee.org

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Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*, in cooperation with the Software & Systems Engineering Standards Committee of the IEEE Computer Society of the IEEE, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

This second edition of ISO/IEC/IEEE 26511 cancels and replaces ISO/IEC/IEEE 26511:2011, which has been technically revised. The main changes compared to the previous edition are as follows:

— increased emphasis on strategic planning to develop a comprehensive content strategy;

— introduction of comprehensive information for managing the translation and localization process;

— comprehensive requirements for conducting a user needs assessment;

— comprehensive requirements for managing an ongoing project;

— focused information on customer quality and project productivity and efficiency measurements; and

— information on process maturity.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Effective management of information for users makes information for users usable, accurate, and delivered when needed by the users. Information managed effectively is produced efficiently and maintained in response to software and system updates and changing user requirements. This document addresses the management of information for users in terms of the overall strategic direction of the information, its initial development, and its subsequent updates.

The role of the information-development manager is comprehensive. The manager is responsible for strategic planning, project planning, project management, staff development and assessment, translation, production and delivery, and quality and productivity measurements. The manager may delegate some or all of these responsibilities to well-qualified staff members.

Information development takes place in organizations of all types, including government entities, corporations, and non-profit organizations.

Effective, well-designed, appropriately delivered information for users increases the return on investment for the development of a software or systems product. It helps to reduce the cost of training and support, enabling the users to decrease the time required to productively use a product. As such, it enhances the reputation of the product, its producer, and its suppliers.

The development of effective information for users should be regarded as an integral part of the software and systems lifecycle processes from the planning and design stages onwards.

This document was developed to assist users of ISO/IEC/IEEE 15288:2015, *Systems and software engineering — System life cycle processes* or ISO/IEC/IEEE 12207:2017, *Systems and software engineering — Software life cycle processes* to manage information for users as part of the Information Management process. This document defines the information-management process from the information-development manager's point of view. It was developed to assist those who provide input to, perform, and evaluate information-development.

NOTE Other documents in the ISO/IEC 265NN family address the documentation and information management processes from the viewpoint of information designers and developers, testers and reviewers, and acquirers and suppliers.

Beyond the development and production of user manuals, help systems, or sets of information for a single software product, it applies to a broader range of information management opportunities, including information for those who install, implement, administer, and operate software, services, and systems for end users. Frequently, information-development managers are responsible for the development and reuse of information (content management) for the following:

— updates of user information as the software or system is updated;

— reuse or adaptations of information to support related products;

— multiple translated or localized versions of information for users; and

— a portfolio of unrelated information-development projects being managed concurrently within an organization.

This document is not intended to advocate the use of either printed or electronic media for information for users or any particular information management, content management, information testing, or project management tools or protocols.

Systems and software engineering — Requirements for managers of information for users of systems, software, and services

1 Scope

This document supports the needs of users for consistent, complete, accurate, and usable information. It provides requirements for strategy, planning, managing, staffing, translation, production, and quality and process-maturity assessment for managers of information for users. It specifies processes and procedures for managing information for users throughout the product- or systems-development life cycle. It also includes requirements for key documents produced for managing information for users, including strategic and project plans.

This document provides an overview of the information-management processes that are specific for the management of information for users. It addresses the following activities:

— developing a comprehensive strategy for information development;

— assessing user information needs;

— planning and managing an information-development project;

— staffing and forming information-development teams;

— reviewing and testing information for users;

— managing the translation process;

— publishing and delivering information for users;

— evaluating customer satisfaction and information quality;

— measuring productivity, efficiency, and costs; and

— evaluating organizational maturity.

The guidance in this document applies to multiple project management approaches, including both agile and traditional practices. Traditional practices can encompass predictive, waterfall, or other top-down management methods. Where certain practices are common in agile project management, they are noted.

This document is applicable for use by managers of information for users or organizations with information developers. This document can also be consulted by those with other roles and interests in the process of developing information for users:

— managers of the product and system development process;

— acquirers of information for users prepared by suppliers;

— experienced information developers who prepare information for users;

— human-factors experts who identify principles for making information for users more accessible and easily used; and

— user interface designers and ergonomics experts working together to design the presentation of information.

This document can be applied to manage the following types of information for users, although it does not cover all aspects of them:

— information for user assistance, training, marketing, and systems documentation for product design and development, based on reuse of user information topics;

— multimedia marketing presentations using animation, video, and sound;

— information developed for virtual and augmented reality presentations;

— computer-based training (CBT) packages and course materials intended primarily for use in formal training programs; and

— information describing the internal operation of products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC/IEEE 12207:2017, *Systems and software engineering — Software life cycle processes*

ISO/IEC/IEEE 15288:2015, *Systems and software engineering — System life cycle processes*

3 Terms, definitions, and abbreviations

For the purposes of this document, the following terms and definitions apply.

ISO, IEC and IEEE maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEEE Standards Dictionary Online: available at http://ieeexplore.ieee.org/xpls/dictionary

NOTE 1 The verb "include" used in this document indicates that either (1) the information is present or (2) a reference to the information is listed.

NOTE 2 This document refers to "the manager," which applies to anyone performing the required management activities, regardless of title or responsibilities.

NOTE 3 Additional terms and definitions relating to information management can be found is *ISO/IEC/IEEE 24765:2017, Systems and software engineering — Vocabulary*.

3.1 Terms and definitions

3.1.1
accessibility
extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use

[SOURCE: ISO/IEC 25064:2013]

3.1.2
annotated topic list
ATL
list of all topics to be included in an information-development project with annotations that can include writer, where used, file name, and additional data

3.1.3
archiving
process of placing a version of a document in a less frequently used storage area

3.1.4
augmented reality system
view of the physical world that is supplemented by computer-generated text, images, data, or other media

3.1.5
authoring environment
toolset used to create, store, and manage content units

3.1.6
burndown chart
graph that represents the work remaining to do on a project

3.1.7
component content management system
CCMS
content management system that supports the entire document- or information-development life cycle from authoring through review and publishing, including the reuse of modular content

3.1.8
conditional text
text that is marked to be excluded from one or more versions of a final content deliverable

3.1.9
customer
organization or person that receives a product or service

[SOURCE: ISO/IEC/IEEE 12207:2017, modified, Note 1 to entry and EXAMPLE have been deleted.]

3.1.10
cycle time
time associated with one complete operation of a repetitive process

[SOURCE: ISO 16484-2:2004]

3.1.11
disaster recovery
ability of the Information and Communications Technology elements of an organization to support its critical business functions to an acceptable level within a predetermined period following a disaster

[SOURCE: ISO/IEC 19086-1:2016, modified, ICT has been replaced by Information and Communications Technology.]

3.1.12
disposition
range of processes associated with implementing retention, destruction or transfer decisions which are documented in disposition or other instruments

[SOURCE: ISO 16175-2:2011, modified, article “a” has been removed before the word “range.”]

3.1.13
Darwin Information Typing Architecture
DITA
XML-based architecture for authoring, producing, and delivering topic-oriented, information-typed content that can be reused and single-sourced in a variety of ways

3.1.14
embedded help system
information for users that is delivered as an integral part of a piece of software

3.1.15
extensible markup language
XML
formal language used to specify the structure of XML documents, specified in the XML Schema Part 1 —Structures Recommendation

[SOURCE: ISO 10303-28:2007]

3.1.16
information architecture
structure of an information space and the semantics for accessing required task objects, system objects and other information

[SOURCE: ISO/IEC TR 25060:2010, modified, domain <human-centred> has been removed from the beginning of the definition and NOTE has been removed.]

3.1.17
information developer
person who prepares the content and visuals for information for users

3.1.18
information type
category of topics, such as concepts, tasks, or reference

3.1.19
intellectual property
output of creative human thought process that has some intellectual or informational value

3.1.20
markup language
method of defining and describing the structure of different types of electronic documents

3.1.21
metadata
data that describe other data

[SOURCE: ISO/IEC 25024:2015]

3.1.22
minimalism
principle for the selection of information for users that supports task performance, troubleshooting, and problem resolution

[SOURCE: ISO/IEC/IEEE 26515]

3.1.23
process maturity
extent to which an organizational unit consistently implements processes within a defined scope that contributes to the achievement of its business needs (current or projected)

[SOURCE: ISO/IEC 33001:2015, modified, term was originally “organizational process maturity,” definition included article “the” preceding the definition, and Note 1 to entry has been removed.]

3.1.24
repository
organized and persistent data storage that allows data retrieval

[SOURCE: ISO/IEC 29155-1:2011, modified, Note 1 to entry has been removed.]

3.1.25
roadmap
detailed plan to guide progress towards a goal

[SOURCE: ISO/TR 14639-2:2014]

3.1.26
security
protection of information and data so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access to them

[SOURCE: ISO/IEC 12207:2008]

3.1.27
source language
language of the source from which content is rendered into the target language

[SOURCE: ISO 13611:2014]

3.1.28
Standard Technical English
STE
controlled language that includes a set of writing rules and a basic dictionary for writing technical documentation

Note 1 to entry: The STE specification is maintained by the ASD Simplified Technical English Maintenance Group (STEMG). The current specification is Issue 6, 15 January 2013.

3.1.29
stakeholder
individual or organization having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations

[SOURCE: ISO/IEC/IEEE 15288:2015, modified, EXAMPLE has been removed and Note 1 to entry has been removed.]

3.1.30
succession plan
process for identifying and developing current employees with the potential to fill key positions in the organization

[SOURCE: ISO 30400:2016]

3.1.31
system testing
testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements

[SOURCE: IEEE 1012-2012]

3.1.32
target language
language into which source language content is translated

[SOURCE: ISO 13611:2014, modified, the word “translated” has replaced the word “rendered.”]

3.1.33
taxonomy
scheme that partitions a body of knowledge and defines the relationships among the pieces

3.1.34
terminology management system
software tool specifically designed for collecting, maintaining, and accessing terminological data

[SOURCE: ISO 26162:2012]

3.1.35
topic
small part of a document that deals with a single subject

[SOURCE: ISO/IEC 26514:2008, modified, NOTE 1 has been removed.]

3.1.36
unicode
system of uniquely identifying (numbering) characters such that nearly any character in any language is identified

3.1.37
usability test
test to determine whether an implemented system fulfills its functional purpose as determined by its users

[SOURCE: ISO/IEC 2382:2015, modified, Notes 1 and 2 to entry have been removed.]

3.1.38
user
individual or organization that uses the system or software to perform a specific function

[SOURCE: ISO/IEC 25000:2014]

3.1.39
user profiles
set of attributes that are unique to a specific user or user group, such as job function or subscription to a service, used to control the parts of the system or web page that users can access

[SOURCE: ISO/IEC/IEEE 23026:2015]

3.1.40
version control
establishment and maintenance of baselines and the identification and control of changes to baselines that make it possible to return to the previous baseline

3.1.41
value chain analysis
entire sequence of activities or parties that provide or receive value in the form of products or services

[SOURCE: ISO 26000:2010, modified, Notes 1 and 2 to entry have been removed.]

3.1.42
work breakdown structure
deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables

3.2 Abbreviations

API	Application Programming Interface, Application Program Interface
ATL	Annotated Topic List
CBT	Computer-Based Training
CCMS	Component Content Management System
CD-ROM	Compact Disk Read-Only Memory
CE	Conformité Européenne
CMS	Content Management System
DITA	Darwin Information Typing Architecture
ECO	Engineering Change Order
FIGS	French, Italian, German, and Spanish
HTML	HyperText Markup Language
MT	Machine Translation
OASIS	Organization for the Advancement of Structured Information Standards
OJT	On-the-Job Training
SME	Subject Matter Expert
STE	Standard Technical English
SVG	Scalable Vector Graphics
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TM	Translation Memory
WBS	Work Breakdown Structure
XML	eXtensible Markup Language

4 Conformance

The requirements in this document extend the requirements of the Information Management process contained in normative standards ISO/IEC/IEEE 15288:2015, 6.3.6, or ISO/IEC/IEC 12207:2017, 6.3.6.

Throughout this document, "shall" is used to express a provision that is binding, "should" to express a recommendation among other possibilities, and "may" to indicate a course of action permissible within the limits of this document.

Use of the nomenclature of this document for the parts of information for users (for example, chapters, topics, pages, screens, windows) is not required to claim conformance.

This document may be included or referenced in contracts or similar agreements when the parties (called the acquirer and the supplier) agree that the supplier will deliver services and systems in accordance with the standard. This document may also be adopted as an in-house standard by a project or organization that decides to acquire information for users from another part of the organization in accordance with the standard.

5 Managing strategy for information development

5.1 Information-development strategy defined

Strategy is a high-level plan to achieve one or more goals in conditions of uncertainty and with the resources available. Ideally, strategy is consciously planned, but strategy also emerges as a pattern of activity as an organization adapts to its environment or competes with other organizations. In information development, strategy should be developed as a result of answering questions such as the following:

— What content is required by customers and other users?

— How will the information-development group develop, test, maintain, translate, produce, and distribute that content?

— What are the important values for the information for users? For example, what is the "mean time to productivity" for customers using the product and associated information for users?

— What tools are needed?

— What processes will be followed?

— How will the information-development organization meet cost targets and schedules?

— What are the organization's goals and strategies?

— What is the business environment?

— What are the most important priorities?

— How do the content and information-development processes add value to the organization and support its goals?

— How will the success of the strategy be measured?

Strategy reflects the value an organization places on providing information that users need to learn and to function effectively.

NOTE Related standards of value to information-development managers and others involved in the process include ISO/IEC 26514:2008, (also available as IEEE Std 26514-2010), ISO/IEC/IEEE 26513:2017, ISO/IEC/IEEE 26515, and ISO/IEC/IEEE 26512.

5.1.1 Purpose of strategy

Strategy is important for information development because information development has a significant impact on the overall organization, its products, and its customers. Information development affects many other functional areas in a larger organization and uses inputs from them to do its work. Information development's outputs are used by others in the overall organization, as well as by customers.

Planned and executed well, information for users positively affects users' experience with the product. In some organizations, the information is itself the product. Good planning and execution of information development minimizes costs and reduces time to market. Good execution is based on good strategic planning.

Poor planning and execution can delay product launches, disappoint customers, and increase costs.

5.1.2 Responsibility for strategic planning

The role of the information-development manager is clarified in relationship to strategic planning in this clause. In subsequent clauses, the role includes the management of information-development projects.

Both roles are described and may be executed by different individuals as stated. The information-development manager is responsible for the information-development strategy, but the manager should not develop the strategy alone. The manager should collaborate with appropriate personnel in other organizations. Some strategic work may be delegated to experienced high-level personnel in the information-development organization or to outside consultants.

See 5.2, Stakeholders, for more information about potential participants in the strategic work.

5.1.3 Frequency of strategic work

The manager should review current practices and determine in collaboration with stakeholders which parts of the information-development strategy to articulate or update at these points in the process:

— when no information-development strategy has been articulated;

— when characteristics of a new project require the information-development strategy to be adapted or modified;

— when the information-development organization is new;

— when new technical trends emerge;

— when the information-development organization has a manager for the first time; and

— when a new manager takes over the information-development organization.

Managers should participate in the higher-level organization's strategic planning, at least as often as is required by the organization. Note that the information-development manager should collaborate not only with people in his or her own reporting structures, but also with relevant stakeholders in other parts of the organization. With input from higher management, the manager should determine whether and when more frequent strategic work is necessary or beneficial.

5.1.4 Reporting structure

Managers in information development report to a variety of groups in an organization, such as Marketing, Product Development, or Customer Support. This variety of reporting structures arises because information development needs inputs from and provides outputs to many groups in any organization. No matter where information development reports, the manager should collaborate with key stakeholders in all relevant organizations when developing strategy.

5.1.5 Compliance

At minimum, the information for users should meet language requirements for information for users in the countries where the product will be sold.

Furthermore, information for users is an integral part of the product. The entire system (including user information products) should be considered as a whole for certain regulatory and compliance requirements. The information for users should accurately reflect what is delivered to users by that system and help users to meet their goals.

Therefore, the manager or responsible party should consider legal and regulatory requirements for user information and should collaborate with the manager for the software or system as a whole. The manager or responsible party or parties may seek advice from country or regional stakeholders to assess the legal and regulatory requirements for each country and region in which products are distributed. This action includes determining required languages for each country or distribution area. The manager may consult with other organizations within the organization for additional guidance so that the information for users meets legal and regulatory requirements. Depending upon the organization, these may include the following:

— Export and import controls;

— Legal;

— Safety;

— Information security;

— Quality;

— Compliance;

— Regulatory affairs;

— Packaging;

— Marketing surveillance authorities.

NOTE In some economic areas a declaration of conformity is required for certain products. The conformity can be expressed by a special marking. This practice applies especially to the European Economic Area (EEA), where conformity with European harmonization legislation is expressed by CE-marking. In some industries, a CE mark is also required in many countries outside Europe.

5.2 Stakeholders

The manager shall collaborate with stakeholders in other groups within the organization to develop the information-development strategy. Note that customers also have an important stake in information for users. Stakeholders include organizations with inputs needed by information development, organizations that use content, and organizations that process outputs from information development. Some organizations provide input to information development and also use outputs from information development. Depending upon the organization, these groups may include the following.

— Customer-facing groups, such as the following:

  — Marketing;

  — Technical support services; and

  — Sales, potentially both centralized and worldwide or geography-specific.

— Groups with inputs needed by information development, such as:

  — Marketing;

  — Product development;

  — Research and development or engineering;

  — Systems;

  — Software;

  — Hardware;

  — Regulatory affairs;

  — Human factors;

  — Quality;

  — Safety; and

  - Technical support services.
- Groups that use content or process outputs from information development, such as the following:
  - Translation and localization;
  - Technical support services;
  - Packaging;
  - Configuration assurance;
  - Regulatory affairs;
  - Distribution;
  - Testing;
  - Release management;
  - Manufacturing;
  - Operations; and
  - Training.

5.3 Manager's strategic tasks and potential actions to support them

5.3.1 General

The information-development strategy shall align with the organization's strategy. This subclause outlines potential actions to support strategic tasks. The manager may use some or all of these actions or additional actions to accomplish the tasks.

5.3.2 Business environment and organization situation

The manager should understand and assess the current business environment and the situation of the organization (or business unit if applicable), its direction, and its strategic plans. The business situation can include factors such as product maturity, competitive landscape, industry or market, whether technology involved is incremental or disruptive, and regulatory and legal controls.

The manager should also consider the following:

- Read media articles about the enterprise.
- Review annual and interim reports.
- Review enterprise mission and vision statements.
- Review feedback from customer support and user satisfaction surveys.
- Attend/participate in strategy meetings.
- Gather and review existing strategy presentations and plans.
- Interview stakeholders about enterprise strategy, goals, and tactics.
- Research the organization's market share and health of the relationship with its customers.

5.3.3 Organizational alignment

Based on factors such as user needs for information, the business environment, the organization's situation, the product portfolio, product and technology roadmaps, and the organization's strategic direction, the manager should develop the information-development strategy and information-development goals to align with the strategies and goals of the organization or business unit. The manager may develop a mission statement for the information-development organization and its outputs, including the information for users.

5.3.4 Product portfolio

The manager should understand the product portfolio and how the information-development organization supports the portfolio.

The manager should also consider the following:

— Review the current product portfolio and how those products meet customer needs.

— Determine product development methodology (traditional, agile, or combination).

— Learn about new product directions.

— Review product or technology roadmaps if available.

— Learn what products or types of products will continue to be supported and what will be phased out and when.

— Evaluate customer demographics and whether and how they are changing.

— Learn about acquisitions if applicable.

5.3.5 Information-development organization

The manager shall review and assess the current state of the information-development organization. The manager may delegate some of these activities:

— Inventory existing content.

— Review information quality.

— Develop or review a list of information types, including their audiences and their attributes.

— Review current staffing strategy if one exists.

— Review current staff and roles.

— Analyze the information-development organization's strengths, weaknesses, opportunities, and threats (SWOT).

— Review the organization's mission and vision statements.

— Analyze the relative importance of cost, cycle time, and accuracy of the organization's content.

— Determine how well the organization's content currently aligns with enterprise needs.

— Review with information-development staff whether and how well information development is receiving required inputs.

— Review with information-development staff what outputs information development provides to what organizations.

— Evaluate information-development life cycle processes currently in place (see [5]).

— Evaluate tools currently in place (see [42]).

— Evaluate the information-development organization's process maturity (see Clause 15).

— Assess the current communication strategy (see Clause 5.4.6 on Communication).

5.3.6 Stakeholder needs

The manager should analyze stakeholder needs, as follows:

— Develop a list of stakeholders.

— Determine how and how well the information-development organization currently supports the needs of the larger organization, and how the information-development organization can better align with larger organization's needs and strategies.

— Gather stakeholder feedback through interviews and surveys, addressing questions such as:

  — What is information development doing well that it should continue doing?

  — What inputs does the organization provide to information development?

  — What outputs does the organization need from information development?

  — How can information development improve?

  — How can new technical developments improve user experience?

5.3.7 User needs

The manager shall analyze user needs for information, as follows:

a) Determine how the information-development organization currently supports the needs of users.

b) Determine how well the content meets user needs.

c) Analyze gaps and how they can be closed.

5.3.8 Vision

Depending upon how far the information-development organization currently is from where it needs to be to align information for users with the larger organization's strategies, the manager should develop a vision for the future. Such a vision should consist of a strategy for which content is needed and how the content will be developed, maintained, translated, produced, and distributed. The vision may also include tools needed and new or revised processes. If the gaps between the current and envisioned state are great, the manager should obtain stakeholder support for the vision, as well as upper management support.

The vision may be extended into a development roadmap. The roadmap should focus on where the information-development manager wants to take the organization in a prescribed time frame such as 3 years or 5 years. The roadmap predicts how the organization will grow, mature, improve, and expand its value.

5.3.9 Executing strategy

The manager should develop tactics, action plans, and timelines for executing the information-development strategy. The manager should set priorities and develop a plan with multiple phases for implementing the strategy. The manager should set priorities for implementation with input from stakeholders and with management approval if necessary. Sometimes implementation requires project or budget approval, which may be accomplished as part of the larger organization's regular project approval process, or as a separate information-development project. In any case, the manager should

obtain stakeholder buy-in and support for any special projects required to implement the strategy, as well as approval from higher levels of management. Depending upon the size and nature of projects and organization's policy needed to accomplish the future vision, some information-development projects or parts of projects should be planned as capital investments. An example is the implementation of a content management system.

5.4 Key decisions

5.4.1 General

The manager should make and implement policies with input from key stakeholders as described in the following subclauses.

5.4.2 Information-product delivery structure

The manager should support the development of an information-product delivery structure. The information-product delivery structure includes a list of deliverables that is structured by audience, purpose, or product type. Deliverable lists should include what media the deliverables are in. Deliverables can be distributed in more than one form, such as:

— physical labels on hardware products or components;

— paper or electronic documents such as PDFs;

— individual topics;

— integrated into software or systems;

— web-based collections; and

— mobile devices.

5.4.3 Intellectual property

The manager should collaborate with other organizations such as legal, marketing, and customer support to determine whether some information is intellectual property that should not be publicly available. The decision may be difficult when customers need such information. In some organizations, such information is considered confidential until the product is released. Alternately, distribution of intellectual property may be confined to internal personnel or only to customers and not released to competitors or the general population.

5.4.4 Content management system

The manager should determine whether the information-development organization needs a content management system (CMS), needs additional functionality in the CMS, or needs a new CMS. If so, the manager should build a business case with the support of Finance and other stakeholders to obtain approval.

NOTE See [42] for details on the requirements for a component content management system.

5.4.5 Staffing

The manager shall determine how to staff to meet the larger organization's needs, including whether and what to outsource, and when and what training or development is required due to changes. For example, information-development organizations that are implementing content management systems often need training and incentives to boost collaboration within the information-development organization and across functions within the larger organization. The manager should take into consideration the location of workers, whether and how remote workers are to be used, and how to manage multiple locations if applicable. See Clause 9 on Staffing.

5.4.6 Communication

The manager should develop and implement a communication plan. In doing so, the manager should consider the following:

— what meetings will be required;

— how cross-functional teams will be included;

— how distributed team members in other locations and time zones will be included;

— which weekly reports are required;

— what systems are in place to track project activities;

— which review meetings have been scheduled;

— how project status has been communicated; and

— how issues are communicated, logged, and resolved.

5.4.7 Information development methodology

The manager shall make decisions on and implement processes required to support the product development methodology. The product development methodology may be traditional, agile, or a combination of both. The manager shall document the processes. The information-development methodology can be agile even when the product development methodology is traditional.

5.4.8 Project management

The manager should prepare a work breakdown structure for each project or group of projects. Subclause 7.2.11 lists recommended high-level WBS elements.

The manager should implement or adapt the larger organization's time-tracking system to build typical task durations.

The manager should document and disseminate information-development dependencies to other relevant groups. Dependencies are inputs that are required or tasks to be completed before information development will be able to accomplish its tasks.

5.4.9 Information management, version and change control, and archiving

The manager shall develop a long-term content life cycle policy or process for controlling information for users, versioning or changing it, and archiving it. The manager shall indicate at which milestones information for users shall be put under control in information development or the larger organization's system(s).

For example, potential milestones that can trigger a version of information for users to be put under control could include when a version goes to translation, when a version is sent to a regulatory body, or when a version is released by the larger organization.

The policy or process should include the following areas:

— the organization's information management and change management philosophy and practices;

— the regulatory and legal requirements in the countries in which the products are distributed;

— how information development implements change control and versioning;

— whether change histories are maintained for individual documents; and

— when and how information versions are archived for legal and historical purposes.

5.4.10 Establishing a long-term content life cycle policy

As part of the strategic planning process and according to the larger organization's policy(ies) or work instructions, the manager should establish the criteria that trigger the following activities. The manager should also communicate these triggers to the information-development organization and to key stakeholders:

— updating and maintaining content;

— vetting changes;

— controlling changes;

— reviewing changes;

— approving changes;

— distributing changes; and

— removing content from view.

5.4.11 Managing distribution

The manager should collaborate with organizations such as marketing, sales, operations, and distribution to determine how information products will be distributed. Potential options include the following:

— physical labels affixed to product components or hardware;

— paper documents distributed in packages with physical products;

— paper documents distributed in response to orders;

— paper documents distributed via push mechanisms such as proactive mailings to customers;

— electronic documents such as PDFs on a website;

— topics integrated into software or systems and delivered to the point of use; and

— topic collections on a website.

5.4.12 Security and disaster recovery

The manager shall determine that a policy and process exists for security and disaster recovery of information for users.

Security means that work-in-progress and outputs are protected from malicious or accidental tampering, as well as unintentional destruction.

In addition, if some information is intellectual property to be distributed to only a limited audience, and if such information is distributed via the internet, the manager shall determine that the security system that is in place allows only the appropriate people to view that information.

The disaster recovery policy or process should document whether information-development deliverables are necessary for the organization to recover from a disaster, and if so which deliverables. If applicable, the policy or process should require that versions of information for users that shall remain accessible are stored in redundant backup locations in case of a natural disaster or other emergency. The policy may also affect suppliers such as print vendors and web services.

Often these policies are organization-wide and are the responsibility of information technology, quality, or another organization-wide group.

5.4.13 Acquisitions

The manager should understand whether acquisitions remain relatively autonomous or are integrated into all organizational systems. If the larger organization integrates acquisitions, the manager should assess the acquisition's information, tools, staffing, processes, and other factors before developing an action plan with timelines and guidelines for integrating the acquisition.

5.5 Translation and localization

The information architecture, processes, and the content of source-language information for users have a huge impact on translation and localization, including not only costs but also quality and cycle time. Therefore, if translations or localization are required, the manager shall incorporate translation and localization requirements as a key component of strategic policies and plans. See Clause 11 on translation and localization.

6 Conducting a user needs assessment

6.1 User needs assessment defined

The manager shall direct a user needs assessment to obtain a clear understanding of user tasks, processes, and working environment. A user needs assessment is essential to develop content that provides the information that users require. When conducting a user needs assessment, the manager may include internal as well as external users.

NOTE 1 Refer to ISO/IEC 25063:2014, *Systems and software engineering — Systems and software product Quality Requirements and Evaluation (SQuaRE) — Common Industry Format (CIF) for usability: Context of use description* for a detailed description of conducting a user needs assessment.

NOTE 2 Refer to ISO/IEC 25064:2013, *Systems and software engineering — Systems and software product Quality Requirements and Evaluation (SQuaRE) — Common Industry Format (CIF) for usability: User needs report* for basic information on creating a report of a user needs assessment study.

Additional information can be found in [7].

6.2 Components of the user needs assessment

As part of developing a needs assessment, the manager should direct the development of the following:

— user profiles;

— user environment analyses;

— use cases and user scenarios; and

— user and task analyses.

User profiles provide an accurate representation of user characteristics. User environment analysis provides a representation of the environment in which the users interact with the products. User task analyses help to direct the structure and content of the information for users so that it supports user roles and tasks.

NOTE 1 ISO/IEC/IEEE 25064:2013, 6.7, provides a brief explanation of user data collection methods and procedures.

NOTE 2 For detailed information on conducting a user and task analysis, refer to [7].

NOTE 3 Additional information concerning a user needs assessment is presented in Annex A.

7 Planning an information-development project

7.1 Information-development project planning defined

The manager shall establish an information-development project and provide crucial planning information about the project that serves as a foundation for the information-development project plan. In this process, the manager relies on the project expertise of the software, systems, or services product manager, the information-development project manager or team leader, and the developers and information developers assigned to the project.

An information-development project plan should be developed for each information-development project, including the following:

— new software, systems, services, and other projects requiring the development of new content;

— changes to software, systems, services, and other projects requiring the revision of existing content and the addition of new content; and

— information-development projects independent of the development of new software, systems, and services requiring new and revised content.

However, some projects are so small that developing a full project plan consumes more time than completing the project. In such instances, the manager may develop generic plans to be used on standard short-duration projects of a particular type.

The planning information assembled by the manager should include the following:

— the position in the product-development life cycle at which the information-development project is most likely to begin;

— the methodology in place for the product development, such as traditional or agile development;

— the goals of the product-development project, such as developing a new product or service, updating an existing product or process, or improving the quality of an existing product or process;

— the scope of the product-development project, including the number of product developers and development teams, the functionality to be developed or revised, and the customers for whom the project is intended;

— the project stakeholders;

— the schedule of the product-development project; and

— risks associated with the product-development project, i.e., untested technology, new development team, faster than normal schedule, or multiple components from both inside and outside the organization.

The manager shall use this planning information to direct the development of an overall project plan or the development of the goals of an agile project.

7.2 Developing the information-development project plan

The manager shall direct the development of a plan for the information-development project. In small organizations, the manager should develop the plan. In larger organizations, the manager may assign the project planning to a team leader, information-development project manager, or the information developers.

For simplicity of reference, each project plan is described as if it were published as a separate document. However, plans shall be considered as conforming if they are unpublished but available in a repository for reference, divided into separate documents or volumes, or combined with other information items into one document. Use of the nomenclature for the plan titles or contents is not required to claim

conformance with this document. The lists of contents (information items) do not specify a normative sequence, structure of parts, or a list of section titles.

The manager shall establish the requirements for each information-development project plan. The project plan may include the following sections:

— project title;

— date of issue and revision status;

— product and information project goals;

— project scope;

— audience profiles;

— content to be developed, revised, or removed;

— accessibility requirements;

— translation and localization requirements;

— project deliverables;

— tools requirements for developing and producing the required information and deliverables;

— information reuse strategy;

— information-development strategies and concerns, including change control and risks and risk management;

— schedule for information development, review, testing, approval, translation and localization, and publication and delivery, including project dependencies;

— estimated project size, with reference to such information as the number of topics, illustrations, words, pages, error messages, commands, or other parameters, depending on the nature of the information-development project;

— estimated project budget and budget dependencies;

— information-development project team members and responsibilities;

— product-development team members and responsibilities; and

— project reviewers and approvers and responsibilities.

Audience profiles should be developed and made available to everyone on the development team. The personas should be current or updated if the target users are altered.

Optionally, the project plan may include the level of security or confidentiality of each document and who will receive or have access to restricted documents.

An information-development plan should be prepared and approved before the development of the information for users begins so that all parties agree on the objectives and methods to be used. After approval, the plan should be distributed as widely as possible; this distribution should include all information-development staff members and should include acquirer staff members and subcontractors, if applicable. If subsequent changes are made to the information-development plan, the manager notifies the affected stakeholders of the change.

A typical template for the information-development plan appears in Annex B.

An information-development plan should be developed at the beginning of each information-development project and updated as necessary during the project as requirements, cost, and schedule are changed.

If a project is being developed using an agile development methodology, the initial information-development plan should include the iterations to be developed and any milestones such as dates to provide the information for manufacturing and translation schedules.

Within each agile development team, a high-level overview of the planned content of each iteration may be developed. These plans are likely to be subject to change since the inclusion of new user requirements may come into the project for inclusion in future releases at any time. See ISO/IEC 26515, *Systems and software engineering — Developing user documentation in an agile environment* for details on the agile process.

7.2.1 Identifying project goals

The manager, working with the project stakeholders, should investigate and define the business and technical goals of the project. A completely new product or service should be differentiated from an existing product or service that is being revised. A project designed to correct errors in an existing product or service may also be described. A project may focus on improving the quality of information for users.

Carefully understanding and defining project goals will assist in focusing the information-development project on the information that is required by the organization to advance the product- or service-development goals or on information that will provide the most useful resources for the users.

A statement of project goals may also include the prioritization of the project in relationship to other scheduled projects. A high priority project may require that staff be shifted from lower priority projects.

7.2.2 Analyzing project scope

The manager, working with the product stakeholders, shall define the project scope in the initial information-development plan, recognizing that the scope may be redefined as more information about the project's goals emerge. The scope definition leads to the selection of team members, the estimate of team size, the range of tasks required for project completion, and the technology required to complete the project. The project scope definition should list the functions already defined by the product-development project.

The identification of project goals should assist the manager in determining the scope of the information-development effort. A project with relatively simple goals of updating existing functionality or adding a small number of functions may result in an information-development effort with a short duration (days or weeks) and minimal effort in terms of assigned staff and time. A major project involved in the development of a new product likely has a large scope with a duration of months or years and an effort involving additions to existing staff and a substantial allocation of time.

7.2.3 Describing users of information

The information-development project plan shall describe the users for whom the product- or service-development project is intended. Information on the intended users of a new product-development project can be obtained from a variety of sources, including marketing, sales, support, training, and product management. Information on intended users for the revision or update of an existing product or service should be obtained by direct user contacts as described in Clause 6, including:

— user surveys;

— data from website analytics;

— user interviews conducted online or through telephone calls;

— user site visits; and

— additional methods of gathering information about user satisfaction and issues with existing content.

This user knowledge assists the information-development team in improving the usability and quality of the updated and revised information.

7.2.4 Describing topics to be developed

The information-development plan shall include an estimate of the project size, with reference to such information as the number of topics, illustrations, error messages, commands, or other parameters, depending on the nature of the information-development project. Some estimates may include the number of pages to be developed in a print- or PDF-based environment. Other estimates may include the number of words to be developed, especially for information that has to conform to a publication size such as product labels or inserts.

For information environments that provide task-based support for product users, the information-development plan should list the tasks to be performed by the users of the product- or service-development project and the supporting concept and reference topics. Although it is unlikely that tasks will have been thoroughly defined at the outset of the project, an initial high-level list of potential tasks and accompanying concepts and reference information will assist in defining the project scope and estimating the required staff, time, and budget allocations.

The information-development plan should include a high-level list of user tasks that will be supported in a new or updated and revised product-development project. The user tasks are not the same as the functions supported by the product but are the tasks from the point of view of the user. A user analysis assists in identifying required conceptual and reference information to support task performance. The task list should support the functions and features planned for the product-development project.

The high-level list of task topics to be developed, updated, or revised should be used to create an Annotated Topic List (ATL) for the project with the addition of conceptual and reference topics. The ATL names each topic to be developed, updated, revised, or reused for the information-development project. This list should be revised throughout the project life cycle and should be used to estimate the scope of work required to complete the project.

New topics result from new functionality that is added to the product or from a new product in development. Updated topics are topics that require new information because the function that the topic supports has been changed. Revised topics are topics that are to be rewritten in light of customer feedback and new usability information about topic quality.

The first part of an example ATL is illustrated in Table 1.

Table 1 — Sample Annotated Topic List

Topic Name	Topic Type	New, revised, updated
Topic 1	task	new
Topic 2	concept	new
Topic 3	reference	new
Topic 4	task	updated
Topic 5	troubleshooting	revised

Topic analysis for information-development project in a non-task environment should also include the development of an ATL that specifies the topics to be developed. Topics include API reference topics or topics that list specifications.

During the topic analysis for the project, the information-development plan should address the disposition of legacy content, representing earlier versions of the software, system, or other product. Legacy content may be removed from the final delivery and removed from the delivery or distribution environment. Legacy content may be versioned so that users of the information are able to correlate their version of the products with the correct version of the information.

7.2.5 Specifying an information reuse strategy

An ATL should include annotations to identify topics that are reused from other projects. Some topics are used exactly as written. Some topics require additions or deletions. Such additions or deletions may be incorporated into the original topics using conditional processing attributes to label additions or deletions for processing or insert additions using content reference mechanisms.

An information reuse strategy is designed to minimize the duplication of information in a repository, eliminating processes required to update the same or similar content in more than one source topic. Duplicating source topics may lead to failures in updating and should be avoided.

A comprehensive reuse strategy may require an XML-based authoring environment and a component content management system, as described in ISO/IEC/IEEE 26531:2015.

7.2.6 Describing accessibility requirements

Working with the information-development project manager, information architect, or team leader, the manager shall assist in describing any accessibility requirements for the information-development project. The accessibility requirements may be developed with assistance from user-experience experts in the organization.

Information that will be distributed through a website or mobile application should meet the following accessibility guidelines:

— ISO/IEC 40500:2012 *Information technology — W3C Web Content Accessibility Guidelines (WCAG) 2.0*;

— ISO 9241-171:2008 *Ergonomics of human-system interaction — Part 171: Guidance on software accessibility*; and

— ISO 9241-20:2008 *Ergonomics of human-system interaction — Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services*.

NOTE For typical requirements for information accessibility, refer to ISO/IEC/IEEE 26513:2017, 7.4.

7.2.7 Describing translation and localization requirements

Working with the localization team, the manager shall assist the information-development project manager or team leader in describing the translation and localization requirements for the information-development project. Such requirements shall include a list of languages into which the content will be translated and the locale for which specific information variations will be developed.

In the case of a new product-development project, the manager should identify new product-specific terminology to be added to the terminology database and existing terminology to be updated for new language requirements.

See Clause 11 for more details on translation and localization management.

7.2.8 Describing project deliverables

Working with the information-development project manager, information architect, or team leader, the manager shall assist in describing the project deliverables. Deliverables can be a list of existing deliverables to be updated with new and revised information, or deliverables can include new deliverables to be developed for either a new project or added to an existing project.

Information project deliverables can include print or PDF publication titles, embedded help systems, quick reference materials, training systems, video, interactive graphics, virtual and augmented reality systems, information for websites, information specifically designed for mobile devices, mobile applications, and other devices or techniques for meeting user access requirements.

For print deliverables, initial estimates should be included in the page count, quantities, and languages to be shipped to users with the product or shipped independently of the product. Initial estimates of

quantity should be included if the information is to be shipped on a physical device such as a CD-ROM or a flash drive.

7.2.9 Identifying project tools requirements

Working with the information-development project manager, information architect, or team leader, the manager should assist in describing any new tools required for the information-development project. In most cases, new tools will be required if new types of deliverables are being added to the project. However, new tools may be required if the management of project deliverables will change.

EXAMPLE An information-development team moving to topic-based structured authoring following the OASIS Darwin Information Typing Architecture (DITA 1.3) standard may decide to use XML-based authoring tools or the addition of a component content management system (CCMS) as defined in ISO/IEC/IEEE 26531:2015 *Systems and software engineering — Content management for product life-cycle, user and service management documentation*.

7.2.10 Identifying quality, review, and testing requirements

The information-development project plan should include the requirements for assessing the quality of the information for users. Information for users that is deficient in quality may be incorrect, incomplete, contain unnecessary information, use inconsistent terminology, be poorly organized, be written at a reading level inappropriate for the intended audience, be difficult to navigate, or lack adequate task orientation. Quality assessment activities may include the following:

— editorial review by a designated editor;

— information design review by an information architect; and

— usability testing with representatives of the user community.

The information-development project plan shall include the requirements for a technical review of the information for users. Technical reviews by subject matter experts are designed so that the content is accurate and complete.

The project plan shall include the requirements for testing the information for users. Testing may include validating the content with the product.

NOTE ISO/IEC/IEEE 26513:2017 includes details on testing and reviewing user information.

7.2.11 Determining the information-development project schedule

The manager shall list the major milestones in the project schedule and provide a preliminary timeline outlining when those events are required to take place. The information-development project schedule shall be developed in coordination with the product-development project schedule. For traditional projects, the information-development initial schedule should include major milestones such as the following:

— information-development draft stages;

— reviews;

— usability testing;

— final approval;

— translation and localization; and

— publication and delivery.

For agile projects, the information-development initial schedule should list major events, especially final delivery requirements. A project time line should be developed to document the relationship between the product-development project schedule and the information-development project schedule.

A more detailed work breakdown structure (WBS) may be used to specify the precise work to be accomplished during each of the project milestone phases. The WBS may include work associated with the following:

— project management;

— information design;

— audience analysis;

— providing information as a subject matter expert (SME);

— research and information gathering;

— writing;

— editing;

— illustrating;

— reviewing;

— revising;

— translation;

— usability testing; and

— production.

7.2.12 Estimating the time and costs required to complete the project

The information-development plan shall include estimated time or cost requirements to complete the information-development project as required by organizational practice. The time and cost estimates should take into account the project scope, the quantity and complexity of the topics to be developed, the illustrations required, the publication deliverables, the translations required, and any external costs to be paid to outside resources.

Estimating the hours and resources required to develop information for users should be performed using a combination of top-down and bottom-up estimates. Both approaches require that at least a preliminary information-development plan or work breakdown structure (WBS) is available.

In addition to estimating resources needed to perform the work, the manager should add any costs for outsourced services such as indexing, translation, production and copying, materials, equipment, packing, and shipping.

7.2.12.1 Top-down and bottom-up estimating

Top-down estimates compare the project with other similar projects. For example, in a series of user manuals documenting printers, an estimate may be based on the amount of content reuse and the decreasing effort needed to document the first four models in a similar line of products. Then, the trend may be extrapolated to predict the effort needed for documenting the fifth in the series.

Top-down estimates for new work compared to previous efforts need to be adjusted, taking into consideration the size and complexity of the project and the skills of the available resources.

Bottom-up estimates combine estimates for each discrete task to form a total estimate. The estimate should be compared to the organization's baseline productivity measurements, such as hours per topic, hours per page, or days per illustration.

When there is a limited budget for a project, the manager should determine whether the allocated budget aligns with the cost estimate derived from the top-down or bottom-up estimates. Discrepancies

can lead to reduction in scope for the information-development project. Similarly, when the project has a fixed deadline for delivery, the manager should determine from the estimate and preliminary schedule whether the delivery date is feasible. The manager should revise the estimate to use additional or more experienced resources, which will make the project costlier, or to reduce the scope of the project if resources are limited, unless regulations or laws prohibit such scope reductions.

7.2.12.2 Complexity evaluation

Although basing a project estimate on similar past projects or similar discrete tasks should result in an average estimate, the information-development plan should include an evaluation of the complexity level of an individual project. A complexity evaluation indicates that an individual project is likely to be more or less difficult, risky, time consuming, and costly than an average project.

While complex probability calculations may also be used to take into account risk factors that indicate whether an individual project is likely to proceed on time and budget, the manager may use a basic linear relationship among weighted risks to predict greater or lesser influences on project success.

The project plan shall list the dependencies under consideration for the current project. A typical list of dependencies includes the following:

— the completeness and stability of the product under development as the information is being developed. A less complete and stable product often requires that information be frequently revised;

— the availability of source information about the product that is accurate and complete when it is needed to support information development;

— the availability of subject matter experts and their willingness to provide information to the information developers. Subject matter experts who are generally difficult to contact, reluctant to provide information, in different locations and time zones, and unable to communicate in the same language as the information developers are likely to increase information-development time;

— the experience in obtaining thorough, complete, and timely reviews from the reviewers assigned to the project;

— the experience of the information developers with the technology of the product. The more familiar the information developers are with the product technology, the less time will be required to learn new information;

— the design and writing experience of the information developers. Skilled, experienced information developers probably will be more productive and require less time to develop information than inexperienced information developers. Even experienced information developers will require additional development time if the design approach to the information has been changed;

— the level of understanding of the user requirements. A team member who thoroughly understands the audience for the information will probably be more effective and faster at developing information of the expected quality;

— the degree of team experience. A team of information developers with a variety of roles and responsibilities and that has worked together effectively in the past probably will be more effective working together on a new project than an inexperienced team.

The information-development project plan shall list the dependencies analyzed for the project and list the risk factors. A typical scale of 1 to 5 indicates that, at a factor of 1, the project is likely to take less time than average and, at a factor of 5, indicates that the project is likely to take more time than average. A factor of 3 on a 1 to 5 scale is neutral.

A dependencies calculation then applies a percentage to each factor. For example, a factor of 1 decreases the time required to complete the project by 0,5 or 50 %. A factor of 3 indicates an average project. A factor of 5 increases the time required by 2 or 100 %. On the basis of a dependencies calculation, an average 500-hour project can take anywhere from 250 to 1 000 hours to complete.

7.2.13 Analyzing risks

Risks during the development of information for users can affect the schedule, cost, or quality of a project. Based on the organization's information-development strategy and the project objectives, the information-development project plan shall identify potential risks associated with the project and plans for avoiding, mitigating, or accepting a potential risk. These include the following:

— risk avoidance — choosing an alternate approach to eliminate a risk;

— risk mitigation — taking steps to diminish the severity of a risk; and

— risk acceptance — determining that the cost of avoiding or mitigating the risk is greater than the potential impact if the risk becomes an actual problem.

NOTE ISO/IEC 31000 has a detailed discussion of risk.

7.2.14 Identifying information-development project team members

The information-development project plan shall list the following:

a) members of the information-development team, including their roles and responsibilities on the project;

b) members of the product-development team who interact with the members of the information-development team by providing information about the product features and functions as they are being developed;

c) project reviewers with their specific areas of expertise and responsibility; and

d) project approvers with their specific areas of responsibility.

Depending on the state of planning, team members may be listed by role or by name. For each project team member identified, the project plan shall specify the responsibilities of the team member during the project.

Members of the information-development team may include the following:

— project manager or team leader—developing the information-development project plan and managing the project to completion;

— information architect—collecting user requirements and developing an information strategy;

— graphic designer—designing the look and feel of the final deliverables;

— information developer—interviewing subject matter experts, writing topics, and working with illustrators;

— editor—reviewing the content for language correctness, completeness, and conformance to style standards;

— illustrator—creating illustrative graphics to accompany the topics;

— indexer—preparing the index and designing a metadata scheme for the topics;

— translation coordinator—managing the translation and localization process;

— social media coordinator—developing a strategy for managing social media;

— publication coordinator—preparing the final deliverables.

7.3 Developing an integrated information plan

The manager should collaborate with other groups in the organization to develop an integrated information plan or curation plan, which is an inventory of all the types of content developed and made available by various groups within the organization. Content may originate with marketing, education and training, external communities, social media, and other sources.

The integrated information plan should list the audience and purpose for each type of content. Such a plan may include information developed outside the organization that is helpful to customers. Such a list should be displayed to users as part of a content portal so that users can link to all the relevant curated content.

An integrated information plan or curation plan helps the organization eliminate redundant work, identify opportunities for collaboration, and identify gaps or unmet content needs among the users.

8 Managing an information-development project

8.1 Information-development project actions

The manager shall be responsible for the following actions during the information-development project:

— managing the project team;

— tracking project deliverables and schedule;

— managing change to the project; and

— communicating information-development project status to the software or systems project team manager and to senior management.

8.2 Managing the project team

8.2.1 Promoting project success

The success of the project is highly dependent on the caliber of the project team. As described in 9.1.3, hiring and training competent resources based on project needs should result in a disciplined and motivated team.

All project team members should:

— be familiar with the information-development process steps;

— adapt and develop a work schedule to meet deliverable and schedule commitments;

— communicate and share information about project status, content deliverables, and project concerns;

— be accountable for individual assignments;

— help the team achieve quality standards in the content developed;

— collaborate in problem solving or escalate problems as necessary.

8.2.2 Establishing team communications

The manager should keep the information-development team in regular communication with the team and their project contacts as assigned or as necessary.

The manager should establish team communication channels, such as group and individual meetings, weekly reports, and verbal status updates. At a minimum, weekly or bi-weekly meetings, similar to the meetings in an agile project, with a clear agenda and objectives should be held. If the team is in

a rapidly moving cycle of the project, the manager should ask for regular updates from information developers participating in agile projects. During regular meetings, the team should focus on these or similar issues or risks:

— Are the planned deliverables on schedule?

— Are deliverables and schedules changing?

— If so, what are the consequences of the changes?

— Is there a planned risk mitigation to keep the project on schedule?

— Should that planned risk mitigation be engaged?

— What if any issues or risks have arisen, and how will the team handle them?

— What, if any, help does the team need from the manager or others in removing obstacles or resolving issues or risks that have arisen?

Managing a global team often places greater demands on maintaining regular communication among team members. The manager should review corporate and industry strategies for managing global teams and implement them as appropriate.

8.2.3 Promoting team collaboration

The manager should create effective collaboration opportunities with review sessions to promote cooperation among team members and consistency in writing style and quality.

The manager should encourage project collaboration, such as:

— relying on fellow team members for assistance when needed;

— discussing work in progress to brainstorm solutions to issues;

— seeing opportunities for content reuse;

— avoiding duplication of effort;

— communicating new ideas for content design solutions; and

— solving content and schedule problems.

The manager should schedule regular team reviews of the content quality, overall design, content reuse opportunities, and customer focus.

8.2.4 Orienting new team members

The manager or the information-development project leader should orient new team members to the project plan and the work accomplished to date on the project. The manager should work with less skilled or experienced team members to know that they understand their assignments and are able to maintain the project schedule and quality requirements.

8.2.5 Managing productivity and performance issues

The manager will have a range of skill levels and productivity levels on the team. The manager should determine what level of productivity each team member is capable of achieving. The manager should identify project delays due to differences in productivity and resolve productivity challenges in the team.

The manager should have frequent routine conversations with each team member to detect early signs of productivity issues, performance issues, and skills gaps that can result in major changes in project scope and schedule if not addressed quickly.

8.2.6 Implementing quality processes

Information quality depends on a high degree of standardization and consistency with established criteria. The manager should encourage all team members to be responsible for achieving quality in their work.

Team members should develop and follow quality guidelines, such as the following:

— Be familiar with the structure and tools of the authoring and publishing system.

— Gain knowledge and expertise of the product, and strive to diminish the dependence on product developers or subject matter experts for all the content.

— Be aware of the audience definition for the project.

— Maintain a consistent structure for similar content.

— Write for users who are not native speakers of the source language, if applicable, and apply a minimalist writing style.

— Run editorial and grammatical tools, and correct content before sending content for technical review.

— Conform to the organizational style guide.

— Review all work completed before submitting it for editorial review.

— Conduct peer reviews, and solicit clarification and feedback where technical content is incomplete or shallow.

— Conduct technical reviews, and base corrections on established content structure and a style guide, not on personal preference.

— Conduct usability testing of the information for users during the development cycle.

— Validate procedures on the product itself, if possible, performing the documented tasks exactly as written, noting discrepancies and non-conformance.

Managing a global team often places greater demand for consistent communication with team members. The manager may create effective collaboration opportunities with review sessions to promote consistency in style and quality or special sessions to address process or other issues.

8.2.7 Managing staff changes

Changes to staffing resources are likely in large or long projects. The manager should review the vacation schedule for each project team member, factor in a percentage of sick time, plan for unexpected emergencies, and realize there may be new hires or vacancies that will affect assignments and schedules.

Although the manager should have risk mitigation plans in place for these contingencies, the following should be considered as possible options to mitigate any impact to quality or the project schedule:

— If staffing changes are near the end of the project, request that the team members assume extra work to keep on schedule.

— Find a more skilled and experienced resource to transfer into the project temporarily.

— Use an outsourced consultant or contractor who is well known and has the skills needed.

— Reduce the scope of the project.

— Revise the project schedule.

The manager should consult with the overall manager of the product-development team if changes to the scope or schedule are required.

8.3 Tracking project deliverables and schedule

8.3.1 General

The manager shall track and document the team's progress regularly. Managers should leverage their experience to determine where product development teams typically change direction and schedules need to be adjusted.

Data is essential to support responses to change, especially if the consequences of making or not making the requested change are also included.

8.3.2 Managing project planning documents

The project plan is the manager's guiding document for the project. The planning documents shall identify the schedule, resource loading, deliverables, and dependencies. As these elements change, the manager should keep the project planning documents updated. If there are changes, the manager should re-estimate hours, due dates, and any changes in deliverables, tasks, and resource assignments as well as capturing the reasons for the adjustments.

The manager may use a burndown chart to quantify and track how much work for a project has been done and to estimate finish times. Burndown charts can include multiple phases for units of work, such as research, writing, review and editing, revisions, and work to increase findability.

The manager is responsible for estimating rework and its impact on the project, as well as including estimates for additional work required as a result of project changes or rework.

8.3.3 New development tools

Tools used for information development change and evolve quickly as organizations compete to meet the needs of customers. Although the skills assessment done earlier in the project should reveal any gaps with using the development tools, the manager should be aware of the constraints that new tools may cause and their impact to the schedule, such as the following:

— Novice team members need time and training to come up to speed on tools used for content authoring and publishing.

— New tools may require new formats or the use of mark-up languages, such as XML, which will require training and practice.

— New tools may cause related processes to change, such as work flows and translation, or cause changes to other components used in content development, such as style sheets, document type definitions, or metadata.

— There is no time for training, so that team members try to learn as they go. As a result, they use the tools incorrectly, adding errors, risk, and extra time to the project.

— New tools may affect cost through time delays, process errors, basic tool training, or mistakes made downstream of content development.

In general, the manager should exercise caution in introducing new tools for a new project. The overhead of learning and training will require additional project time.

8.3.4 Managing scheduling issues

The manager should intervene to remove obstacles or resolve scheduling issues. These obstacles and issues can include the following:

— Product information needed by content developers is unavailable or is behind schedule.

— Access to the subject matter experts (SMEs) or product developers is limited.

— Late product changes have occurred.

— Review schedules are not adhered to.

The manager should focus on issues promptly to avoid bigger problems later. Some paths to resolution are managed through better communication or meetings with individuals who are challenged to meet their deliverables or with their managers. An unsatisfactory result may require the manager to escalate or negotiate for a change in processes. Negotiation may lead to more positive response. If a problem seems untenable, escalation may be required, and if so, it should be documented in status reports.

If issues emerge, the manager should include project members and stakeholders in the discussions and solicit solutions from all involved. Decisions should be documented. Risk mitigation plans should be reviewed for applicable scenarios and their possible solutions.

For all time estimates, the manager should consider factoring in a small percentage of additional time to accommodate for the overhead of unexpected changes. For example, if using a 10 % margin, if 10 topics of new content are required, and the estimate is 2 hours of development time per topic, an additional 2 hours for 10 topics should be added for minor changes. There is an expectation that work estimates improve in accuracy during project development.

The practice in some organizations is to estimate overhead for unexpected challenges for the whole project vs. overhead in each function, so that overhead does not slow the whole project unnecessarily if it turns out not to be needed in a single function. This practice provides the whole project team flexibility in making up for delays across the whole project. In this case, the manager should not factor in overhead for information development alone.

8.4 Managing project changes

8.4.1 Managing change control

The manager should expect and prepare for changes that may negatively affect the team’s ability to meet deadlines. The manager should follow the larger organization's standard change control process, if suitable, for the information-development project. Changes may be recorded/documented in a change management system and assessed for possible consequences to budget, resources, and schedule of the project. Revised estimates may be required.

8.4.2 Planning and preparing for changes

Although unplanned changes may occur from a very large number of sources, many are common and should be expected:

— not understanding the customer requirements;

— schedules that are overly aggressive;

— over-burdened resources; and

— gaps in expectations between project team, product development, and executives.

Experienced managers understand that inherent risks in any project often result in missed deadlines or delays of deliverables. It is the responsibility of the manager to plan risk mitigation for multiple scenarios during various phases of the project. A prepared fallback plan is much more desirable than having no plan when obstacles in reaching milestones arise. Refer to 7.2.13, Analyzing risks, for more detail on risk mitigation. The following subclause describes the manager’s role in handling changes and their associated risks.

8.4.3 Assessing the impact of project changes

In response to project changes, the manager shall determine the following impacts:

a) Existing content to be revised.

b) Existing content that is no longer needed.

c) New content to be developed.

Although changes to the schedule can be small, these changes may accumulate and make deadlines unachievable. The manager should advise the team to avoid accepting or committing to changes without project team discussion and assessment of the impact to the schedule, because changes typically impact the entire information-development team.

For example, if the project scope is 100 topics and 20 new topics are required due to project changes, this 20 percent increase in the workload affects not only the content developers, but also the editors, reviewers, translators, and publishers.

All requested information or scope changes should be documented and tracked with a record of the disposition of each change and why it occurred. Changes should be accepted, mitigated, or rejected for reasons listed.

The manager should know that all milestones have plans in place that provide alternative options if delays or changes in scope occur. Some examples of these scope changes are listed below:

— reduced resources due to unexpected illness or loss of an information developer;

— an increase in product features due to late customer requirements; and

— additional languages added to the translation requirements.

If the schedule needs to be extended as a result of project changes, the manager should assess and communicate the impact immediately so that all project members understand the consequences of such changes. Delaying or avoiding project delays may impact the next set of milestones, creating a cascade of missed deadlines.

8.4.4 Revising project estimates

To assess the impact of any change, the manager should consider the workflow through which the change will be processed. For example, if a new feature will require two new topics, this addition affects every step in the development workflow and will require a revised estimate for learning the new features, writing, creating graphics, conducting technical reviews, adding links to the new topics (if web-based), factoring additional time for translation, and adding quality assurance and publishing time.

Changes in scope, schedule, product features, resource availability, product testing, and subject-matter expert availability for technical input and reviews are all possible examples of changes or delays that may have compounding impacts on the project. The manager should revise project estimates based on what is achievable and be able to commit to those revised estimates with confidence.

8.4.5 Recalculating the project due to changes in scope

The process below may be used for recalculating project estimates when there is a change in scope:

1) Review and assess the proposed content changes of what needs to be added and deleted. This calculation can include graphics and any interface changes as well.

2) Check the current productivity rate by running a time comparison between the original estimates and the actual time spent on the project to date.

3) If there is discrepancy between the estimates and actual hours, determine why and where the discrepancy occurred. Investigate whether the information-development team received what they needed when they needed it.

4) If the project dependencies were not met, recalculate the hours per topic.

5) Apply the new calculation of hours per topic.

6) Consider at what point these changes occur in the project. Changes in the development phase are easier to accommodate than changes in the final stages of product readiness.

7) Communicate and document the impact of the additional hours added to the project estimates. Impacts may include not only customer delivery of the current project, but also subsequent planned projects that use the same resources.

8.4.6 Maintaining quality and the project vision

8.4.6.1 General

One of the highest risks of scope changes is with quality. The manager should work with the project team to consider whether lost time is gained with reduced or eliminated quality assurance steps and if that is acceptable. Revised project estimates may be accommodated by:

— extending delivery dates;

— shifting or amending milestone dates to run tasks in parallel or in a reduced time frame;

— adding resources;

— reducing or eliminating some deliverables; and

— renegotiating project quality.

Each of these options brings different results, with advantages or disadvantages to be weighed against the project viability for success. Any reduction in quality should be a last resort of any mitigation plan or renegotiation of the project vision, and in some industries eliminating deliverables or quality steps is not acceptable.

8.4.6.2 Extending delivery dates

Although extending dates is most likely the simplest solution to a change in project scope, it also has many disadvantages:

— Extending the schedule means additional project hours, which increases project cost.

— Schedules for projects in the queue will be affected by the unavailability of resources working additional time on the current project.

— There is no guarantee that all the same resources will be available for additional project hours.

— Customer satisfaction and corporate revenues are negatively affected if the delay causes a missed market window of sales opportunity.

Conversely, the manager should consider the benefits of additional time.

— The current team may continue the work without new resources, which will require training or, at a minimum, overall additional time to come up to speed.

— The expected quality level and project vision do not necessarily need to change and the project likely will meet the customer expectations or industry requirements.

— The additional time may accommodate required new or modified content.

New product technologies and new product requirements can slow the initiation of a project if they are not fully understood. Lost time at the project start may ripple through the project timeline and require extended deadlines.

The manager should consider tasks that may be run in parallel during a contingency delay and reassign resources while waiting for the new information. Moving forward on incomplete information presents a high risk of wasted effort and rework.

8.4.6.3 Adding resources to the project

If an extended timeline is not an option, adjusting resources may be the most viable solution. The manager should evaluate the benefits and challenges of adding new resources to a project. Some benefits include the following:

— keeping the project on its original timeline, with minimal delay for deliverables; and

— new resources bring new and useful skills that may improve quality or save time through better efficiency.

However, when increasing staff, the manager should also take into account the following:

— Additional time should be allocated to allow new resources to come up to speed.

— The team dynamics will change with new members.

— If hiring new resources, additional time will be required for interviews and the hiring process. This will also require time pulling existing staff from other work to interview and train, potentially delaying other projects.

— Increasing the team size requires more people management and increases the importance of good communication.

8.4.6.4 Modifying the project scope

If extending dates and adding resources are not acceptable responses to project change, another option is to reduce the scope of the project. A change in scope often means that something will not get done. If the response to a project change is a change in the information-development project scope, the project's original budget should be maintained, the timeline affected minimally, and the quality of deliverables not affected.

A change in project scope requires reprioritizing what is essential to the project and what can be eliminated to keep on track. The manager should evaluate how the change in scope affects information-development deliverables. The following are examples of possible outcomes of reprioritizing due to a change in project scope:

— There are fewer topics to write.

— Content is focused on task-based information (procedures) and conceptual information is minimized (for example, overviews and functional descriptions).

— Online help content (e.g., .chm files) is reduced or eliminated.

— Fewer languages are selected for translation.

— Output options are limited to only web-based content, eliminating hard copy outputs.

— Reduced set of training materials is produced.

The manager should review and obtain project team and stakeholder approval for any modifications in scope from the original commitment of deliverables.

8.4.6.5 Impacting project quality

The least favorable option in response to accommodating a project change is a compromise in quality. The manager should be aware that the impact to quality may result from actions such as the following:

— Peer, editorial, technical, or safety reviews are cut, shortened, or eliminated.

— An inadequate or incomplete validation is done of content against product features.

— The evaluation of product or information usability is omitted.

— Translations are not reviewed internally and rely on the vendor quality assurance process.

— Representatives from legal, trade, customs, or export controls are left out of review cycles.

When a project change forces the project team to look at quality as a possible compromise, if any quality steps are eliminated, they should be documented with the reason, potential impact, and what was gained by doing so.

However, the manager should first consider extending the schedule, increasing resources, or decreasing the project scope before deciding to save time by reducing quality steps.

NOTE Reducing or eliminating quality steps is not acceptable in some industries without a risk assessment or justification.

8.4.7 Instigating changes

During the development phase, the project team may discover issues with the product that require a project change. The manager should review and champion these changes on behalf of the information-development team. The following are examples of issues that can warrant project changes:

— potential usability issues with the interface design;

— additional customer requirements that were not known or anticipated; and

— quality issues from previous versions of the product to be resolved.

If the information-development team learns about new customer requirements after the project has started and initial planning is complete, the manager should determine if and how these discoveries impact the current schedule.

The manager should review the current project status with original estimates and determine if the changes require revisions to the project plan or if they can be accommodated in the current plan. The manager should use the normal project change management process to initiate a project change.

8.4.8 Discovering quality issues

As a possible consequence of poor quality or lack of technical understanding, the project team may discover existing quality issues from the previous version of the information. Information may be inaccurate, missing, incomplete, or simply poorly written for the intended audience.

The manager shall assess and compare the previous content to the current requirements and determine if any adjustments to the project timeline or resource requirements need to be made now or later or waived until the next release.

If the manager decides to correct any major issues, deferring the less important ones for the next project, some considerations for assessing the severity of quality issues include the following:

— Is the quality issue related to tasks the customer is to perform? If inaccurate, what may/will happen with the current version? What may go wrong for the customer?

— Is the quality issue related to noncritical conceptual information unrelated to the functionality of the product?

— Is the quality issue related to an image, table, or reference? Is this information covered in the text or elsewhere correctly?

— If the text is poorly written, will simple edits help with better usability?

— How much time is needed for the quality corrections and will it require a delay in the schedule?

8.5 Communicating with the project team and management

8.5.1 General

The manager shall communicate the status of the deliverables and the project schedule to project members and stakeholders. This reporting should include why progress is not being made on some deliverables, what action has been taken, and what, if any, assistance is needed to keep the project on track. The manager gains better cooperation when communication is partnered with transparency.

The manager should be aware of project updates that are being communicated externally, either directly to customers or in organizational reports. These may prompt a communication check by the product team, and, if necessary, communicate any delays in the schedule. The manager should be in routine communication with product marketing to be aware of changes to products or schedule or possible changes after prototypes are delivered to the customer.

8.5.2 Communicating with the project team

The manager should establish regular meetings with the team so that all project members report out on their deliverables and activity. Meetings should record minutes with decisions documented, and should be distributed to the project team.

The manager should schedule meetings for each type of focus and provide agendas to clearly state the meeting objective. For example, the manager may schedule design review meetings where the team discusses the information design, or, status meetings where the team focuses on progress and issues. Other meetings may focus on brainstorming for a solution to a problem, or a scheduling meeting to review dates and deliverables. If the project is deep into development and a sudden and urgent problem arises, the manager should schedule daily meetings to keep communication flowing as the team works through the unexpected changes that need to be made.

In addition to regularly scheduled meetings, the manager should schedule meetings as needed to resolve any issues that arise, such as to brainstorm solutions to problems. Agendas should be sent beforehand and minutes distributed to all relevant parties with decisions and action items.

8.5.3 Communicating with stakeholders

The manager shall regularly review the metrics that were agreed upon at the start of the project. The manager should include data from those or other metrics with formal communication and reporting. Metrics should clearly identify progress and challenges.

The manager shall provide status regularly and promptly raise any concerns. The manager should solicit concerns from stakeholders. The manager should openly discuss solutions or compromises.

The manager should anticipate that not all stakeholders share the same expectations of project requirements and objectives. For example, stakeholders do not fully understand dependencies or appreciate the complexity of some tasks. The manager should communicate frequently with all stakeholders, explicitly checking for misunderstandings to avoid disruption and conflicts.

8.5.4 Communicating with senior management

The manager should develop strong communication channels with senior management, providing meaningful and accurate data that management understands and is able to use on further communications upward. At the project conclusion, the metrics should report on the degree to which the project met its objectives.

9 Staffing and forming teams

9.1 Staffing and forming teams defined

A critical element for the success of information-development projects and organizations is personnel management, particularly staffing and forming teams. The manager shall be responsible for the following personnel management tasks:

a) identifying and assessing required skills;

b) defining roles and responsibilities;

c) hiring and training staff, or outsourcing staff positions;

d) evaluating staff performance;

e) developing staff;

f) creating a succession plan for key roles and skills; and

g) aligning project teams to engineering models such as traditional or agile.

The manager shall be responsible for the completion and quality of the above tasks. The manager may, however, delegate the execution of specific tasks to senior members of the staff, such as an information-development lead or information developer.

9.1.1 Identifying and assessing required skills

The manager shall identify required skills for each project and strategic skills for the organization. In larger organizations with more than one concurrent project, skills may be shared across projects. Skills may also be combined into defined roles; for example, the role of team lead may combine planning, information design, and testing skills. Required skills are necessary for the successful completion of a project. Examples of required skills include the following:

— requirements analysis;

— customer-relationship management;

— information design;

— information architecture;

— content management;

— content development (writing);

— editing;

— graphic design;

— system testing of information for users;

— usability testing;

— translation and localization;

— specific technical subject matter expertise;

— estimating, scheduling and planning;

— project management;

— authoring tool expertise;

— content management tool expertise; and

— service and information maintenance skills.

Teams shall be formed for a given project to bring together the required skills to promote success of the project.

Strategic skills are necessary for the long-term viability of an organization and to prepare for success of future projects, even if current projects do not require such a skill. Examples of strategic skills include the following:

— future technology expertise (for example, for future product lines);

— advanced content management expertise or advanced content management tool expertise, to achieve strategic content management objectives;

— skills required for advanced programs, but not required for current projects;

— advanced management or leadership skills;

— skills required to align with strategic objectives of a larger organization;

— information life-cycle management and strategy; and

— skills necessary to fulfill a succession plan.

9.1.1.1 Identifying, assessing, and addressing gaps in required skills

The staffing plan for each project shall take the required skills into account, with the goal of forming a team that covers the required skills.

The manager shall assess the status of skill coverage for a given project prior to the beginning of the project. Some skills are critical to project success; other skills are desirable but not critical.

Where a gap exists between required skills and existing skills, the manager has the following options to mitigate the skill gap:

— borrowing or sharing a skill across projects or teams. For example, editing skill can often be shared across multiple teams;

— hiring experienced staff with the required skill for the project;

— training an existing staff member in the missing skill; and

— outsourcing the skill.

The manager shall demonstrate that required skills have been identified and assessed for each project or set of projects in cases where the number of projects is high. The manager shall demonstrate that current staffing meets the requirements or that a plan is in place to address gaps in the requirements. If the project proceeds with skills gaps, the manager shall document that the risk of proceeding with the gap has been identified, accepted, or mitigated.

9.1.1.2 Identifying, assessing, and addressing gaps in strategic skills

The manager should periodically identify and assess strategic skills that have long-term or future value to the overall organization.

Where a gap exists between current skills and the desired strategic skills, the manager should create a plan to close the skill gap in a time frame that addresses the strategic need. Examples of how a manager may address a strategic skill gap include the following:

— Hiring staff with expertise in the strategic skill.

— Engaging consultants or trainers to offer a training program for in-house staff to learn the strategic skill.

— Beginning a mentoring program to increase the depth of skill across the staff.

— Supporting attendance at external training programs for current staff.

— Creating on-the-job training opportunities for staff to begin practicing the strategic skill in a penalty-free environment.

— Borrowing resources with that skill and arranging cross-functional training.

9.1.2 Defining roles and responsibilities

The manager shall define roles with clearly differentiated responsibilities at both the project and the organization level. Roles may combine multiple skills; several roles can require the same skill. For example, the role of a project team leader may combine planning, information design, and testing skills. The role of senior designer may require information design and content development skills. A role defined at the organizational level may be content strategist, with advanced content management and advanced product technology skills, to provide direction to multiple project teams.

One staff member may perform multiple roles. For example, a very experienced staff member may be both the content strategist for the organization and the team leader for a specific project.

Multiple staff members may perform the same role. For example, there may be three content developers on the same project team.

Certain skills may be required in all roles, such as problem-solving, clear communication, or teamwork. The manager should carefully define roles based on the following considerations:

— the size and experience of the current staff. For example, a small staff does not need a team leader role. As another example, experience may indicate that a team leader is necessary to success of the project in which a team has multiple junior content developers.

— the content strategy for the project influencing the types of roles required. For example, an organization with a high degree of shared content across projects may require a lead architect role that spans multiple projects.

— the expectations and norms of the larger organization. For example, the term "chief writer or chief information developer" may be more appropriate than "lead writer or lead information developer" in a particular industry.

— standard roles associated with particular development or engineering processes, such as traditional or agile. ISO/IEC/IEEE 26515 describes information-development roles in an agile development team.

— personnel policies and standards that also dictate the levels of responsibility within roles, such as the designations junior information developer, information developer and senior information developer.

— career goals and development goals of individual staff. For example, a manager creates a lead information developer role as a path to developing team leader skills for a specific staff member.

— reuse of content across functional areas. For example, if content can be reused in areas such as training, marketing, or professional services, it will be appropriate to include cross-functional coordination as a role.

— future strategic goals for the organization. For example, if the organization has a focus on improving customer service, it will be appropriate to create a service leader role.

Managers should use the considerations listed above to define roles adapted specifically to the needs of their teams and organizations. However, common roles often found on user information-development teams include the following:

— manager;

— content strategist;

— team leader, project leader, or project manager;

— information architect;

— taxonomy architect;

— content developer or information developer;

— visual or graphic designer;

— editor;

— experience researcher, interactivity designer, or instructional designer; and

— localization coordinator.

The manager shall identify skills and responsibilities for each role and communicate these expectations to the assigned staff. This information may be documented and communicated using organization or project job descriptions, or in information-development plans, or through annual performance objectives. The manager should evaluate and assess staff based on their fulfillment of these expectations.

For more examples of common roles and skills, specifically related to DITA adoption, see [4].

9.1.3 Hiring and training staff

The manager shall be responsible for a staffing plan. The staffing plan may include full-time or part-time staff, outsourcing with contractors or contracting agencies, or the use of consultants. The goal of the staffing plan is to meet the skill requirements, both required and strategic, for a given project or for the overall organization. One approach to filling the skill and capacity needs for information-development projects is to hire staff. Another approach to meet skill or role gaps is through training or mentoring of existing staff.

9.1.3.1 Hiring staff

If additional full-time or part-time staff are required, the manager shall identify the required skills and intended roles for the new staff, and sources of candidates. Sources include internal hiring within a larger organization or external hiring. The manager shall collect evidence that the selected candidate has experience to meet the skill and role requirements of the target project or organization.

9.1.3.2 Training staff

Another approach to meet skill or role gaps is through training of existing staff. Even where skill or role gaps do not exist, ongoing training of staff is important to the vitality of an information-development team, to career development, and to succession planning. Newly hired staff also require training as they integrate into a new organization.

The manager should identify a training plan that may include the following:

— addressing required or strategic skill gaps;

— cross-training for team vitality, for example to provide backup capacity or to provide flexibility of staffing for peak periods. As a specific example, training multiple staff on editing skills provides the manager the ability to temporarily increase the editing capacity of a team without hiring additional staff, and as a further example also provides backup capability if an editor is absent for an extended period;

— developing staff to achieve career goals, such as additional leadership training to enable career transitions into new roles or expanded responsibility in a current role;

— preparing for a succession plan, so that others on the team are prepared to take on the skills or roles of key members who leave or move into new roles; and

— orienting newly hired staff to the procedures, processes, technology, or other elements of the new position.

A training plan may consist of a range of approaches, such as:

— more experienced staff training others on the staff;

— outside trainers or experts in the desired subject area hired to provide on-site training;

— on-the-job training (OJT) under the supervision of a more experienced staff member or the manager;

— mentoring programs within the organization; and

— outside training sources such as certification programs, offerings from professional societies, online training programs, or college or university offerings.

As training is completed, skill assessments and identified gaps should be updated.

9.1.4 Outsourcing staff

As part of a comprehensive staffing plan, the manager may consider outsourcing with contractors, contracting agencies, or consultants to meet the skill and capacity needs for information-development projects.

Before making an outsourcing decision, the manager shall identify the required skills and intended roles for additional resources required. As part of the selection process, the manager shall demonstrate that the selected source meets the skill and role requirements of the target project or organization, with the ability to complete work on schedule, within budget, and with the desired quality levels.

Unique considerations for the manager as part of the decision to outsource include the following:

— cost relative to budget;

— location of the outsourced resource. Consider if work has to be done onsite or if it may be done remotely;

— ability of the outsourced staff to obtain necessary security clearances;

— communication with both the user information-development team as well as extended engineering or stakeholder members;

— quality control of the work to be completed;

— software and authoring tools required to complete the work;

— whether any of the information is proprietary and the type of security required to protect it;

— project management of the outsourced work, such as setting and monitoring of schedules;

— possible overlap or contention with in-house staff roles;

— impact on longer term skill gaps and succession plans, if the outsourced staff provides skills not present within the in-house staff;

— impact on long-term vitality of the manager's organization, for example if the outsourced work does not meet quality standards, or if the outsourced staff is perceived as more competent than the in-house staff; and

— whether the product is nearing end-of-life and has a lower maintenance priority.

When making an outsourcing decision, the manager shall identify methods to monitor and manage the outsourced resources to mitigate any of the above considerations that are relevant. Methods include the following:

— specific language in the contract about quality standards, schedule or budget;

— clarification and definition of roles on both the in-house and outsourced staff;

— training of the outsourced staff, or cross-training between in-house and outsourced staff;

— establishment of a liaison role, or team leader role with responsibility for the outsourced work;

— identification of communication methods and frequency, to be used with the information-development staff as well as other affected stakeholders;

— a means for feedback to the outsourced staff on quality of work or areas for improvement; and

— termination criteria for ending the contract.

The manager shall be responsible to assess the success of the outsourced skills or roles at the completion of the project or contracted obligation.

An organization may choose to follow ISO/IEC/IEEE 26512 to acquire services to support the development of information for users for its products.

9.1.5 Evaluating staff

A key responsibility of the manager role is evaluation of staff performance. The format, frequency, and content of evaluations will likely be determined by the organization's Human Resources programs and policies. The manager shall comply with all such organizational requirements.

Within those constraints, the manager should strive to address status of and improvement in the level of required and strategic skills expected of a given staff member.

Frequent ongoing evaluative feedback is a good practice for managers to provide the opportunity for staff to improve or correct performance issues before formal evaluation.

Managers do not conduct performance evaluations or create development plans for contract employees. Contractors are provided necessary training, but not development or performance evaluations.

9.1.6 Developing staff

Beyond training of staff for required skills for current projects, a manager should consider longer-term needs of both individual staff as well as the organization. Ongoing training and development of staff is important to the vitality of a user information-development team, to career development of individuals, and to succession planning.

As mentioned previously, the training plan for a project or organization may address:

— developing staff to achieve career goals, such as additional leadership training to enable career transitions into new roles or expanded responsibility in a current role; and

— preparing for a succession plan, so that others on the team are prepared to take on the skills or roles of key members who may leave or move into new roles.

In addition to such a training plan, the manager shall consider individual development needs of each staff member, and work with each staff member to balance the goals of the individual with the overall mission and goals of the organization. To meet individual development needs of a staff member, a manager may offer:

— on-the-job (OJT) training;

— mentoring;

— career counseling;

— various training offerings;

— support for participation in certification programs or professional societies; and

— other programs that are available from the organization's Human Resources function.

The manager shall also consider the strategic goals and strategic skill requirements of the organization and know that the training plan as well as individual development plans support achievement of those strategic goals.

9.1.7 Succession planning

As part of a comprehensive training plan and individual development planning, a manager should consider succession planning for the organization. To effectively incorporate succession planning into training and development, the manager should:

— identify critical skills and roles needed for the success of a project or the organization; and

— as part of the skills assessment or otherwise, inventory the availability of critical skills that currently exist, and the availability of individuals who are able to fulfill the critical roles beyond those currently in them.

A critical role that should be considered includes that of manager of the user information-development team. The current manager should consider succession planning for his or her position as part of the training and development plans created for the staff, within the guidelines of existing Human Resource policy and procedures for the organization.

9.2 Aligning teams with the engineering life cycle

One special consideration in the formation of teams is alignment with the engineering life cycle or processes that are used in the larger organization. While the manager has formed information-development teams based on required skills and common information-development roles, the engineering processes in operation for a given project or organization also influence the structure of the team. For example:

— In a traditional model, only one team leader is required; in an agile model, multiple lead information developers are required (one for each scrum team).

— In a traditional model, an organization may share one localization coordinator; in an agile model, each team needs someone with knowledge of localization processes.

— In a traditional model, a team has a schedule planner; in an agile model, each content developer manages his or her own schedules.

The manager shall understand the governing processes and operational models for each project and modify the team structure, roles, and skills appropriately.

NOTE ISO/IEC/IEEE 26515 describes information-development roles in an agile development team.

10 Managing technical reviews

Prior to final publication of information for users, quality control processes shall include formal reviews of information for users. The objective of technical reviews is to promote consistent, complete, accurate, and usable information throughout its life cycle, not just during development. These reviews should include the following, when applicable:

— review of information for users;

— system test of information for users;

— usability testing of information for users;

— accessibility testing of information for users;

— translation and localization review and testing; and

— user-centered review and test guidelines.

These reviews should be conducted by experts for the type of review required. Review approvals shall be retained as quality records. An organization may have an automated system for tracking the timing and completion of technical reviews. The information-development manager should use such a system if available.

NOTE ISO/IEC/IEEE 26513:2017 has details on the standards for evaluation and testing of user information. This document contains details on evaluation methods and procedures, examples, and objectives.

11 Managing the translation process

11.1 Translation requirements

Product, industry, or customer requirements may make it necessary to translate information for users into the native languages where the product is sold or used. In some organizations, the manager is involved in collecting, defining, and implementing translation requirements. Whether responsible for translations or not, the manager shall incorporate the translation strategy into the information-development planning and scheduling process. If translation is required, the factors in the following sections should be considered.

See ISO 17100 *Translation services — Requirements for translation services.*

For details about the translation management, see Annex C.

11.1.1 Languages

The most basic translation requirement is which languages are needed. The decision is based on factors including the following:

— marketing plans for a product;

— user needs in the countries and locales targeted;

— legal or (if applicable) regulatory requirements in those countries, including Conformité Européenne (CE) mark approval. See Annex C for details on the CE mark.

— the requirements of employees whose first language is not the corporation's source language;

— whether the user interface is translated. Generally, if the user interface is translated into a language, the information for users should be translated into that language as well. However, some countries require information to be in local languages even when the user interface is not.

The manager should research the languages and dialects required for the targeted countries and locales. In addition to determining languages, the manager or responsible person should determine which, if any, local dialects are required.

11.1.2 Character sets

If language translations are required, the translation specifications should include character sets and fonts to be used.

11.1.3 Timing

The manager or responsible party shall include required timing of translations in the translation strategy and plans and preferably in the overall project plans.

11.1.4 Deliverables

The translation strategy should specify typical deliverables for each language; a translation project should specify the deliverables for each language, including the format required. The deliverables can include PDFs of documents of various sizes or for various audiences, user assistance, web content, etc. It may be easiest to manage these specifications in a spreadsheet. For example, see the table of selected languages.

Table 2 — Sample Translation Worksheet

Projects	ar	bg	cs	da	de	el	en	es	et
1	1	1	1	1	1	1	1	1	1
2					1	1			
3	1	1		1		1		1	1
4	1	1	1	1		1		1	1
5	1		1	1	1	1			

ar = Arabic

bg = Bulgarian

cs = Czech

da = Danish

de = German

el = Greek

en = English

es = Spanish

et = Estonian

This worksheet assumes only one dialect per language. The legend for the language codes is in the column at the bottom. The worksheet can be made more complex and useful by multiplying the number of languages times the cost per page of that language.

11.2 Selecting translation and localization approaches and services provider(s)

The manager may be involved in or responsible for translation strategy and for selecting service provider(s) for language translation and localization. Different corporations take different approaches to translations. The manager or responsible party should decide how to manage translations from the options below:

— internally vs. externally through one or more providers;

— centrally in a domestic firm or in a small number of translation centers, or distributed to the regions or to individual countries; and

— some combination of the approaches above, depending upon language and geography.

11.3 Translation cost estimates

The manager or responsible person should include translation estimates as part of project and in yearly or periodic budgeting, in alignment with organizational practices.

11.4 Translation memory management

Translation memory is a database that stores "segments," which can be sentences, phrases, or sentence-like units (headings, titles, or elements in a list) that have been translated, in order to aid human translators.

If an organization's translation service provider uses automated translation memory, the manager or responsible party should consider ownership of the translation memories in a contract or service level agreement with the provider. There are advantages and disadvantages to the organization owning its translation memories.

The manager or responsible party should determine the answers to the following questions as part of the translation strategy:

— Is the service provider allowed or encouraged to use the translation memories for other clients?

— Is the service provider allowed to use translation memories from their other clients? (Note that other clients include organizations within the corporation and external clients, and the answers may be different for external vs. internal clients.)

— Does the organization want to retain ownership of the translation memories?

— Will the translation service provider share translation memories with other translation service providers, in cases where additional translation service providers are needed?

— Will the provider transfer translation memories to the organization or to a new service provider if the organization decides to use a different vendor? If so, is that reasonable and feasible given the potential for higher costs?

11.5 Machine translation

If the organization uses machine translation, managers should use one or more of the following methods to improve quality:

— limiting the domain;

— strict use of terminology;

— if the source is in English, use of Standard Technical English; and

— use of non-ambiguous language or automated checkers.

When accuracy is important, post-editing and normal review procedures should still be used to promote high quality.

11.6 Translation review and quality control

Reviewers and testers of the translated and localized content and user interfaces should be located in the target country, know the target language, and have the necessary technical knowledge. If the same dialect will be used in multiple countries, the reviewers and testers should be located in the countries that use that dialect. If the user interface is translated and localized, it should be tested against the translated and localized information for users. Integrated information should be tested for proper linking. See ISO/IEC/IEEE 26513:2017 for more information on testing.

NOTE Language and terminology change over time; therefore, a translator who no longer lives in the target country could be unfamiliar with current usage. However, sometimes it is not possible to use in-country translators, such as when the translation will be used in multiple countries.

The types of problems that may be identified during localization review of information for users include the following:

— inaccurate translations of text due to errors in word choice;

— editorial errors in grammar and spelling;

— composition errors in page layout, including missing text;

— missing translations of the text in images and diagrams;

— localization errors due to inappropriate choice of examples, illustrations, and other culturally significant subjects in the source language;

— screen captures not matching the user interface, whether localized or not; and

— broken links in integrated information.

11.7 Terminology management

Through systems or processes, the manager or responsible person should enable information developers to use terminology in the source language consistently and correctly. Also, the manager or responsible party should select target language terms for key terminology in the source language and in the knowledge domain of the content.

Product, component, and proprietary names are particularly important terms. The manager or responsible party should determine for each language whether these names remain in the source language or whether localized product names should be used, usually with input from both local and organization-wide marketing. Those decisions are affected by whether source language names are trademarked, in which case the manager or responsible person should determine whether a target language term is able to be or should also be trademarked in local geographies. The connotations of translations in the target language are a key consideration in the decision whether or how to translate product names, and such decisions should be made per language.

At minimum, a terminology database should include the source language term and the target language term, including an indication whether it is translated. The term's definition and an example of proper usage are also helpful to specify the concept. Terminology management can also specify a term's part of speech, gender, and other attributes.

11.8 Writing for translation

Managers should encourage or require information developers to create content that is easier to translate. The organization should require training in writing for translation.

Mechanisms for improving the source language include the following:

— style guides, which can be automated or manual;

— editing with translation in mind;

— applying Standard Technical English (STE) in writing style; and

— software ambiguity checkers.

11.9 Managing the translation and localization of the user interface

The manager may be responsible for translating and localizing user interfaces as well as information for users, especially in smaller organizations. In such cases the manager shall coordinate schedules and implementation with the teams that develop and release the user interface.

Translation and localization needs should be included in the initial planning and definition of requirements or specifications for software and user interfaces. After the user interface and software are complete, it is usually expensive or even impossible to translate or localize without major rework.

11.10 Guidelines for user interface translation and localization:

Reference strategies or tables for naming objects should be used in the user interface by language, rather than hard wiring source language in the software itself. This reference table is sometimes called a schema, and the data in the schema is sometimes called a data dictionary. These strategies enable programmatic mapping for user interfaces.

In the source user interface, room should be left forlanguage expansion, especially if the source language is English, Japanese, or Chinese. These languages tend to be more compact than other languages. If the target languages include any of the European languages such as German, they can take 30 % to 40 % or even more space for certain terms.

Wherever possible abbreviating target language terminology should be avoided. If abbreviations are unavoidable, the abbreviations should be made by translators of the target language rather than by developers or speakers of the source language.

Preferences for units of measure, date, time, number, and currency formats should be enabled.

If a user interface allows users to select a language, the name of the language should be displayed in that language. For example, the user interface should list Deutsch rather than German.

12 Managing final production and delivery

12.1 Final production and delivery defined

Production and delivery are the steps for making final deliverables, assuring their quality, and setting them up to be delivered to users. These processes sometimes include many detailed steps for each language in which information is produced. Many of the processes can be automated to reduce the cycle time during what is often the critical path to product delivery. The manager shall provide training in and documentation of the steps and processes required.

12.1.1 Final approvals

The manager or delegate shall ascertain that the final required approvers have approved the content. In some organizations, this approval may be part of the Engineering Change Order process. See Clause 10 on Managing technical reviews.

12.1.2 During production

For each language produced, the manager or the manager's delegate should institute the following steps as part of production.

For printed versions or PDFs:

— Generate and check indexes, tables of contents, lists of figures, and glossaries if applicable.

— Generate and check the final documents.

For HTML, help, or other output types:

— Compile and check files.

— Check that links work in all languages.

For all information, perform quality assurance and proofread according to the list(s) developed earlier, including final checks of graphics.

12.1.3 At delivery

The manager or a delegate shall complete the final steps of the production process. The steps and their order may vary by organization, for example:

1) Release the final approved deliverables (physical and virtual) to the organization's data management system or other enterprise system.

2) Complete handoffs to vendors and production people.

3) Post final approved deliverables on organizational websites if appropriate.

4) Test that topics and PDFs are properly displayed online.

5) Complete First Article Inspection if appropriate. For example, Quality Assurance, Information Development, and Packaging together inspect the first item(s) delivered from vendors or Manufacturing Final Assembly so that all the items are included and in the proper place. As part of this inspection, participants verify that the correct label(s) in the correct language(s) appear on the appropriate place on packages, and all the documents or physical pieces on the Bill of Materials are in the packaging and correctly assembled.

6) Archive final version of final native source files, as well as final PDFs and HTML files. These source files can be used as the foundation for information for users for subsequent products and services.

Even though a product is no longer sold, people may still be using it. Content should only be removed from viewing on websites only in situations such as the following:

— when a product end of life date has been identified and communicated to the public, for example, because of a completed product recall;

— when the content should not have been released;

— when the wrong version of content was made visible;

— when the content was made visible in a geography where products do not have regulatory or legal approval;

— when the content contains errors that may be dangerous to users or equipment and needs to be removed immediately, even before revised content is released.

12.2 Before production time

While content is still being developed, the activities listed below should be completed before the production phase, which is often on the critical path to product release. If these tasks are done ahead of the production phase, the production phase will run faster and will run more smoothly. In some organizations, this activity is handled by purchasing or production departments. If so, the manager or delegate should collaborate with those departments on specifications and schedules for the following:

— the tools and content have been preprocessed and tested;

— quality assurance or proofing lists have been developed, preferably based on the types of errors that are likely to happen with the publishing and compiling systems;

— vendors have specifications or instructions for producing or duplicating deliverables, including delivery schedules; and

— for physical deliverables such as printed manuals, CD-ROMs, Bills of Material, other mechanisms for associating information with a particular product have been defined.

13 Measuring content quality and user satisfaction

13.1 Measuring content quality and user satisfaction defined

The manager shall develop a process and set of metrics to assess the quality of the content delivered, including defect identification as well as indicators of user satisfaction.

a) Identify the set of metrics to be used to assess quality across projects, including defects and user satisfaction.

b) Ensure a process is in place as necessary to collect the specific measurements for each project.

c) Use the measurements to correct defects and, through root-cause analysis, improve the information-development process.

d) Where possible, use user feedback to validate the measurements of quality and user satisfaction.

e) Strive to develop predictive metrics that lend themselves to be measured in-process (during development) to take preventive action before content is delivered.

The manager may, however, delegate the data collection, measurement tracking and analysis, or other related tasks to senior members of the staff, such as a team leader or lead information developer.

NOTE ISO/IEC 15939:2007, *Systems and software engineering — Measurement process* provides more detail on measurements. ISO/IEC/IEEE 26513:2017 specifies processes for use in testing and reviewing of user documentation.

To facilitate comparative analysis, a base set of metrics should be used across an organization for all projects. The information-development plan should include the metrics to be used and the data to be collected, at the outset of any given project.

Measuring quality and user satisfaction is essential to continuous improvement of the information for users and underlying process. Collecting and analyzing measurements over time also enables the manager to use trend analysis to substantiate and quantify improvements in information, as well as identify problem areas that need correction or remediation. Instances of especially successful information as well as successful process approaches may be identified as best practices to be replicated across teams.

Metrics should contain the following attributes:

— well-defined, so that everyone has the same understanding of its meaning;

— has a range, a meaningful domain, and a known slope; that is, the shape of the curve is understood;

— easily measured or worth the effort to measure;

— reproducible or repeatable; and

— provides a meaningful measurement of process outcomes and quality.

For a metric defined as the number of XML coding errors per 1 000 words, the range is 0 (no errors) to 1 000 (every word is in error). The domain is the entire range. The slope is negative (larger numbers are worse than smaller numbers). The metric is objective and, given a specified authority, repeatable. Automated coding checkers make it easy to collect the measurement and the measurement can be repeated reliably. Coding errors impact the quality and consistency of the output and thus the measurement is meaningful and may immediately lead to remediation of the defect. The metric is errors per 1 000 words. The measurement for a specific document can be "15."

13.1.1 Measuring quality defects

One definition of quality information for users is information that meets the user's requirements. Managers should have an understanding of user requirements that may then be used to develop metrics to measure conformance to those requirements. The next section ("Measuring User Satisfaction") describes ways to use user feedback to measure user satisfaction. However, there are also many generally applicable standards and characteristics that help assess the quality of information, regardless of the specific user. To measure the extent to which these quality characteristics are present, quality metrics for information for users traditionally track the number of defects (when information deviates from or is lacking in the quality characteristic), such as grammatical or spelling errors, or discrepancies between the information and accepted standards for content, structure, and format. Such user information standards should be referenced in the project plan or in organization-wide quality standards. Discrepancies, or defects, from generally recognized standards influence the user's impression of reliability and quality of information. Various types of editing reviews, peer reviews, checklists, or automated tools can be used to evaluate conformance.

Some examples of standards-related quality defects that may be tracked or measured include the following:

— deviations from a specific style guide;

— grammar or spelling errors;

— flagged language in automated tools that aid in improving the translatability of text;

— comments/corrections from editors; and

— formatting errors flagged as non-conforming by authoring tools.

Other quality defects to be measured and tracked compare the current information with a broader definition of quality information for users, such as:

— technical accuracy;

— completeness;

— clarity;

— task orientation;

— visual effectiveness;

— use of samples and examples; and

— ease of searching, browsing, linking for online information.

For a useful example of a quality model upon which to base defect measurement, see[2].

Project plans should include a process to measure explicit quality goals. The project plan may include remediation plans for specific metrics. At a minimum, managers should identify a metric to track conformance to a base set of standards, and to track accuracy errors. As an example of the latter, a metric to track technical accuracy is the number of errors per 100 topics. Technical accuracy is measured prior to delivery using technical review comments, and post-delivery based on customer-reported service calls.

The manager shall put a process in place as necessary to collect, evaluate, store and share the measurements.

13.1.2 Measuring user satisfaction

Managers should identify sources of user feedback to directly measure satisfaction with the information. While conformance to standards and internal assessments of adherence to quality model characteristics are often good predictors of user satisfaction, they are not a guarantee of "quality" in the eyes of the user. Well written or beautifully presented information that does not solve the user's problem is not, in the eyes of the user, a quality document. Users or user representatives may determine if user requirements for the information have been met.

Sources of user feedback include the following:

— usability testing, especially if the subjects are actual users or representative users (same skill and knowledge level);

— reader comment forms, including online feedback forms;

— comments in online forums, such as service forums for a product;

— user site visits;

— defect reporting through a formal product service process;

— interviews with user-facing personnel;

— help desk calls; and

— feedback from training personnel on product information used.

Managers shall develop metrics and a supporting process to collect the data needed to measure user satisfaction, using available user feedback sources wherever possible. All project plans should include a process to measure, evaluate, store and share specific user satisfaction metrics.

Examples of possible user-based metrics for user satisfaction include the following:

— average rating on survey questions about quality at the end of a usability test ("how satisfied are you with this information on a scale of 1 to 5”);

— percent of online feedback forms rating information good or very good;

— number of user-reported accuracy errors per 100 topics, as documented in service desk calls;

— tracking of information comments in online user group forums (In this case, the measurement is binary whether the comments are being tracked or not. A process should then be in place to analyze and follow up on relevant comments.)

— number of service desk calls per month solved by referring the user to information (this measures the findability of information);

— rating of perception of information quality on a 1 to 5 scale based on interviews with user-facing service personnel (for example, if the information-development group does not have direct access to defect data or service logs).

13.1.3 Correcting quality defects and improving the process

The manager shall use quality measurements to identify and correct defects and, through root-cause analysis, improve the information-development process.

Many defects may be identified and corrected prior to delivery of the information to the user. Examples of such defects are spelling or grammatical errors, deficiencies identified during the editing process, or technical errors identified by subject-matter experts during internal technical reviews. If necessary, the manager should have a method of prioritization for corrections based on impact to the user. For example, technical accuracy errors are generally considered high priority for technical information, while some organizational improvements (additional supplemental information, for example) identified in the editing process may be delayed without severe impact on the user. For any defects identified but not corrected prior to delivery of the information, the manager shall have a process for tracking the appropriate corrective action and timing (for example, to be corrected at a specific time frame, to be considered as a future requirement or optional suggestion, or to be rejected). The manager shall also have a process for tracking and handling defects identified post-delivery, again with a classification of priority, action, and timing. Often these processes are established and documented at the organization level. If so, individual project plans should either reference the organization process or explicitly state an alternative defect-correction process.

In addition to establishing a process for correcting defects, the manager should establish a process to selectively conduct root-cause analysis on critical defects that may lead to opportunities for process improvement. Not all defects lend themselves to such analysis and the manager most likely should not invest the time to analyze all defects, but the manager should establish criteria to selectively trace back the source of a subset of critical defects to their origin in the information-development process with the goal of improving the process to prevent such defects in the future.

As an example, if a particular information set has a higher than average number of spelling errors, a root cause analysis can identify that the source content came primarily from new information developers who are not sufficiently trained on the spell-check tool; corrective action may include required tool training as part of the orientation process for all new information developers. As another example, a technical accuracy measurement can identify a higher than usual number of accuracy errors. Root-cause analysis can identify that the key subject-matter expert for that document did not participate in the technical reviews. A resulting process improvement can identify "required reviewers" without whose review the information-development process should not proceed.

13.1.4 Using user feedback to validate measurements and improve processes

Where possible, the manager shall use user feedback to validate the measurements of quality and user satisfaction. As stated earlier, conformance to standards and internal assessments of adherence to quality model characteristics are often good predictors of user satisfaction but they are not a guarantee of "quality" in the eyes of the user. Further, user feedback provides another opportunity for the manager to use root-cause analysis to improve the information process.

In addition to collecting quantitative data for user satisfaction metrics, the manager should establish a process to access, collect, and monitor available sources of qualitative feedback about the information and seek to establish correlations to the quality or user satisfaction measurements. For possible qualitative sources of feedback, see 13.1.2.

While not a formal metric, awareness of trends in such feedback over time may provide valuable insight into the validity of formal metrics. The most important insight is where the feedback subjectively indicates a quality level clearly not aligned with the quality measurements. For example, in the worst case, the measurements may have indicated a high-quality piece of information while the user feedback indicates high dissatisfaction or critical quality defects. Such a mismatch should trigger root-cause analysis to determine why the metrics are not producing measurements that align with the user view of

quality. Such a situation may also reveal new user requirements that had not previously been known or understood. In either case, the manager should investigate improvements to the measurement process or the information-development process, so that future information better meets the needs of the user with corresponding metrics to accurately assess quality and satisfaction.

Specific comments or feedback may identify defects or areas of improvement that should be addressed according to the defect correction process. Such defects may also present an opportunity for root-cause analysis to improve the information-development process to prevent similar errors in the future.

13.2 Identifying predictive measurements for preventive action

Where possible, the manager should develop metrics that can predict quality or satisfaction when measured in-process (during development), so that preventive action is taken before content is delivered. A predictive measurement is one that is correlated over time with a given quality or satisfaction result. For example, a manager may analyze poor user satisfaction ratings of information over time and determine that a common process characteristic across those instances is a low number of subject-matter expert reviewers, or in some cases only a single technical review meeting. If no information with ten or more SME reviewers and two or more technical reviews has been found to have poor user satisfaction ratings, this becomes a predictive, in-process measurement that should trigger preventive action before completing the information-development life cycle. That is, if a set of information has a review with only six SMEs and only one technical review meeting, then the process should require a second review meeting or additional SME reviews before the information is completed for delivery.

As another example, a manager may analyze poor user satisfaction ratings of English-language information over time and determine that a common characteristic across those “poor” instances is a measurement of "50" or less on an automated syntax tool used to assess clarity of text for translation. Perhaps the recommendations from this tool were not required to be addressed for information known to be shipping in English-only. However, based on user-satisfaction analysis and correlation, this rating now becomes a useful predictor of quality and satisfaction even for English-only information, and a minimum rating may be added to the process as a criterion for passing the information-development phase.

14 Measuring productivity, efficiency, and cost

14.1 Importance of measuring cost, productivity, and efficiency

Managers shall regularly track actual costs to provide data to assist in more accurately budgeting and estimating the amount of labor required for work, as well as to assess whether process improvements and new tools are effective. Productivity and efficiency are valuable measures derived from the cost of resources consumed and deliverable output over comparable periods of time.

In addition, managers should track other measurements on either a short-term or long-term basis to illuminate problems and suggest areas needing improvements and to derive feedback about the effectiveness of efforts at improvement and innovation.

A baseline should be established against which subsequent measurements reflect improvements or deterioration.

Managers may use measurements to illuminate or help solve particular cost, productivity, and efficiency problems.

14.1.1 Operational costs

Managers should review periodic operational spending reports if they are provided by the organization. Managers should note whether actuals are running over or under budget or forecasts, determine why the deviations from forecasts have occurred, if possible, and escalate any issues in a timely way.

NOTE Budgeting is usually done yearly. Forecasts are periodic projections (quarterly or sometimes even monthly) to estimate future spending.

14.1.2 Labor costs

For most information-development organizations the vast majority of costs are labor costs. Labor costs may be broken down into categories:

— regular employee costs;

— contract employee costs;

— costs for consultants who work on short-term projects to produce a particular deliverable; and

— charge-back labor costs from elsewhere within the organization.

NOTE In some organizations, consultant costs or charge-back labor costs are considered discretionary and can be combined as professional services or some other label.

14.1.3 Non-labor costs

The most common and important non-labor costs for information-development organizations include the following categories:

— training;

— travel;

— computers and other equipment or depreciation of those assets;

— software, software licenses, and software support costs; and

— supplies.

At some organizations, managers are also responsible for tracking various types of overhead costs, such as telephone expenses and building occupancy costs.

14.1.4 Translation, printing, and publishing costs

In some organizations, the information-development manager is responsible for translation, printing, and publishing costs. In those organizations, the manager should monitor these costs along with other information-development costs.

14.2 Project costs and time tracking

Project costs are generally the most important costs that information-development managers track. Because (aside from translations and printing) labor represents the majority of the cost of developing information, information-development managers should track staff time on projects or require staff members to track their time spent on projects. Information-development organizations that are part of larger development organizations are usually required to track labor or time spent on product development, on sustaining projects, and sometimes on other activities. In organizations with effective time tracking systems, managers should use those systems to track and report time on projects.

14.2.1 Time intervals

The granularity or time interval for tracking should be determined by what is most appropriate for the information-development organization. In organizations where some individuals work on many projects, the granularity or time interval can be small. The interval selected should support the reasonable progress of work, for example, hour, half hour, or quarter hour. Usually information-development tracking is hourly or by day, week, or month. Tracking is important, but it should not become burdensome.

14.2.2 Time allocation

In some organizations, the costs for information-development organizations are "allocated" periodically, such as once a year as part of annual budgeting. Annual budgeting occurs most often when information-development is not part of product development. For example, under an allocation agreement, 50 % of a particular information developer's time (and cost) is allocated to one project or division, 20 % to a second, and 30 % to a third. However, even in such allocation environments, internal clients sometimes want more detail about actual time spent on their projects. Therefore, even in organizations that allocate time on a yearly or other basis, tracking actual time on projects often makes sense, not only to amass data to assist in budgeting and project estimates, but also to report to internal clients.

14.2.3 Typical activities for tracking time

Managers may require workers to track time on various activities. Time tracking should be appropriate to the project needs. The number of activities should be fewer than 15-20, so that it is easy for workers to determine what activity to record. Activities for information-development time tracking may include but are not limited to those listed below. Note that in some organizations all training is combined into one activity, as well as potentially all administrative tasks, regardless of whether the activity is related to projects or not.

Project-related activities include the following:

— research and planning;

— writing;

— editing and review;

— developing illustrations;

— improving findability: Indexing, linking, metadata, keywords, and others;

— production and publishing;

— product or project training;

— administrative tasks related to projects, such as meetings, email, and status reporting;

— rework (see 14.4.2 on rework). Activities not related to projects include the following:

— administrative tasks such as performance reviews and non-project email and meetings;

— training not related to projects; and

— vacation, sick leave, and personal time off.

14.2.4 Overtime

All project efforts should be recorded so they can be used to improve future estimates. If overtime hours tracked are restricted, tracking will incorrectly report the amount of work required to complete projects, leading to inaccurately low estimates for future projects and a downward cycle of stress and overwork.

14.2.5 Monitoring project costs

As part of project management activities, managers should monitor budgeted or forecasted time (labor) versus actual time (labor) per project on a regular periodic basis. Managers should also monitor any non-labor project spending. Managers should analyze results and try to determine the causes of variances in order to drive better budgeting and forecasting in the future, as well as to intervene where necessary, such as to reallocate personnel.

In organizations lacking time tracking systems, or in those where systems provide insufficient data, managers should develop a methodology for tracking and reporting information-development project costs. The manager should document any such methodology so that the same methodology may be used for all projects.

In their calculations, managers may use an average cost for information developers (and other workers), such as the general measurement below, rather than the compensation for particular individuals.

Average cost = budget (or spending)/capacity (or time units of work done)

where

budget = total budget for a time period (such as a year), including overhead

and where

capacity = total available staff time units per year

EXAMPLE Assume that an organization has 10 information developers and a budget of $1 300 000 per year. A fulltime worker at 40 hours per week has 52 weeks or 2 080 hours. However, available work time should be calculated at less than that to account for paid time off and sick leave. Some organizations use 1 960 hours (49 weeks) per year for estimating purposes. Thus, the available work capacity of this organization would be 490 weeks (or 19 600 hours), and the rate for work would be $66/hour ($2 653/week).

14.2.6 Reporting project costs

Managers should determine whether the organization provides periodic project reports to project managers. If not, the manager should collaborate with project managers to determine what if any project reporting is necessary and at what frequency.

Managers should note variances over or under a certain percentage or absolute amount, so that upon request they may help explain variances. For example, depending upon the expectations of a management team, managers should proactively report variances over $5K or 20 % under or over project budget.

Information should be stored so that multiple people can access the information and build reports from it.

14.3 Productivity measurements

One of most managers' major goals is to maintain or preferably increase productivity. Therefore, in addition to tracking and reporting on project costs, managers should periodically track and report overall productivity, for example, yearly or at the end of major releases. Productivity measurements enable managers to defend the value added by their organizations in proportion to their budget allocations in ways that are meaningful to their organizations.

Increasing productivity implies that activities that were not possible given the current budget may be accomplished. If an organization becomes more productive (efficient) performing current activities or decides to eliminate activities that are determined to have low value to the customer, the organization increases the value it contributes.

Information-development management may, for example, eliminate from the portfolio work that is not valuable to the customer, perhaps because that work is never accessed or read by the customer. The organization may decrease the number of words produced by adopting the practices of Standard Technical English or the organization could obtain better tools.

The manager may request a budget increase, perhaps as a higher percentage of the product development budget, so that current optimized work is continued and the strategic backlog addressed.

Many potential methods of tracking productivity are available. The most common productivity measure is a variation of the cost/units produced for a specified period of time. Another common productivity measurement is the cost of information development as a percentage of product development costs.

In organizations with effective reporting on operational and project costs, the total cost may be derived from that reporting. Lacking such reports, managers should develop and document their own methods for calculating costs.

Reporting on units produced introduces more variables, requiring that units be carefully selected. They may include one or more of the following or other units that make sense for the particular organization:

— number of total topics;

— number of new topics;

— number of deliverables, potentially broken down by type (PDFs, videos, help files);

— number of new or updated products supported (weighted by size);

— number of Engineering Change Orders (ECOs) addressed;

— number of pages; and

— number of words.

Measuring the number of pages or words is less desirable because these measures tend to result in more words and pages rather than high-quality minimalist information, which has been shown to be more usable as well as more cost-effective.

To provide a more accurate picture of productivity, these units may be weighted. For example, topics may be weighted according to their size or complexity, using a scale of 1-5 or another logical scale.

14.4 Efficiency measurements

Efficiency is another key metric to judge whether work has been accomplished in the smallest amount of time or with the smallest amount of labor. Generally, efficiency is highly desirable. When efficiency measures show differences between individuals, teams, projects, or divisions, managers should investigate why. Differences may be due to the amount of experience or skill of an information developer. Differences may also derive from the knowledge, skill, or practices of the overall product development team. The purpose of the investigation is to remedy problems, to promote best practices, and to institute training so that the efficiency of the organization is continuously improved.

However, there are two major exceptions for the information-development organization where sub-optimizing the work of information development may be better for the organization overall. The first exception involves translations. Investments in making the source language as unambiguous and easy to translate as possible can result in substantial translations savings. Such savings are multiplied by the number of target languages.

The second exception is product usability. Some organizations start information development early in the product development cycle with the goal of ensuring optimum product usability. In those cases, early versions of the information are used to understand how a product works, to show to customers involved in development, and to know that products are easy to explain and thus easy to understand and use. In those cases, information products usually change many times over the course of development, and thus the information-development process is less efficient.

NOTE Efficiency measurements are not used for evaluations of individual staff members but as evaluations of the overall processes used.

Three measurements are often used in information-development organizations as indicators of efficiency: reuse, re-work, and cycle time. Other efficiency measurements may also be used.

14.4.1 Content re-use

Re-use of information is a common indicator of efficiency, especially, though not exclusively, in organizations with content management systems.

Re-use can come from different contexts, including but not limited to the following:

— units re-used across multiple different product models;

— units re-used for subsequent products;

— units re-used across deliverables for different media, such as embedded help, web-based help, and PDFs;

— units re-used in training and marketing materials as well as information; and

— units re-used by customers in their own information.

Content management systems can automate the collection of re-use statistics, for example by tracking the number of times a unit has been used. Conversely, some content management systems can automate the tracking of what percent of an information product is new. Managers in organizations with content management systems should collect and report re-use statistics from the content management system.

Managers in organizations without automated re-use tracking may develop a methodology to estimate re-use manually, although with larger units.

To make re-use statistics more understandable for upper management, re-use can be expressed in monetary units using a calculation such as the following:

(Cost for the initial creation of a unit of content) × (# of re-used units)/(# of times the content is reused)

NOTE If the content is not re-used, # of times is "1."

Re-used content can also be calculated as follows:

(Total number of words in a repository related to a product)/(Total numbers of words in all forms of output for a product)

EXAMPLE If the total numbers of words in the repository is 100 000 and the total number of words in all forms of output is 1. 000 000 words, then the re-use efficiency measurement is 1 to 10, representing 90 % re-use.

14.4.2 Content rework

Rework, or doing work more than once for whatever reason, is an indicator of inefficiency. Managers may use it to assess how much additional productivity a team could achieve if the causes of rework were eliminated. Rework can indirectly measure whether an organization is getting inputs on time or the right inputs. Managers may make rework one of the ongoing time-tracking activities or use it short-term to illuminate and provide evidence of process issues. When managers measure rework, they should seek to understand its causes and implement solutions.

However, content improvements, including usability studies, may require rework during the information-development life cycle. Not all rework is considered inefficient.

14.4.3 Cycle time

Cycle time indicates efficiency by demonstrating how long a project or a task or activity takes to complete. Among possible cycle times, managers should choose to measure activities that are key to the organization's goals, especially if and when information development is on the critical path for product shipments or release (and therefore revenue).

Information development is sometimes on the critical path during the time required to publish content after it has been approved and during the time required to complete translations after the source language is frozen.

Cycle time can be measured in terms of the duration of an activity as well as by the elapsed time, the latter of which includes waiting time. Both duration and elapsed time should be included in any value chain analysis, the purpose of which is to highlight potential inefficiencies so they may be reduced or eliminated.

15 Evaluating organization process maturity

15.1 Organization process maturity evaluation

To align expectations among the project team and with all stakeholders, managers of user information projects should evaluate the organization's process maturity level. This assessment is important for identifying gaps in process that may affect the overall success of the project. The following are functional areas that intersect with an information-development project and should be evaluated for their maturity and ability to meet set standards, forecast task duration, complete tasks on time, and result in expected quality of deliverables.

Performing a maturity assessment is a recommended practice periodically or before starting a major project to better understand and plan for potential process and quality gaps. Conducting an assessment at the conclusion of a project (sometimes referred to as a post-mortem assessment) offers the opportunity for the entire project team to compare the desired or undesired outcomes and gain insight to their respective possible causes. What worked well should be promoted and repeated. What did not should be further evaluated for corrective action so as not to be repeated and thereby result in an improved subsequent project outcome.

To evaluate the organization process maturity levels, the manager of information-development projects should assess the degree to which the following elements are true and put plans in place to mitigate or close the gaps discovered.

— **organizational structure** that promotes efforts to produce quality technical information for users, including the current reporting structure for the organization;

— **quality assurance** that successfully promotes the quality of the information-product deliverables, including developmental editing and technical reviews;

— **planning** that promotes the notion that information products will meet the needs of customers in addition to meeting deadlines;

— **estimating and scheduling** processes that estimate the time and costs of each information-development project undertaken so that the value delivered is worth the expenditure of resources;

— **hiring and training** responsibilities to hire qualified individuals worldwide so that they have access to product and professional training;

— **publication designs** that encourage staff to pursue innovations in information design and delivery rather than continuing to publish the same documents year after year;

— **cost control** to know exactly how much the work done by the organization costs, including the cost of innovations, tools improvements, and basic information development;

— **quality management** that actively promotes activities to improve the quality of the information to be delivered, including customer studies and feedback from customer-facing groups;

— **change management** that drives awareness of the importance of collaboration to improve quality and reduce costs and actively promote collaboration activities in the organization; and

— **collaboration** that implements a change-management plan to introduce innovations, tools, and methods without undue resistance from internal and external staff.

NOTE For additional information, see [5].

15.2 Process Improvement

Process improvement is an important responsibility of the manager of information for users. Each project brings the opportunity to assess areas of strength and areas that have challenges.

In addition to data-driven metrics established for the project, the periodic or post-project process evaluation should include an assessment of the degree to which the following met its success criteria:

— **information-development strategy** – evaluating the content development, delivery, and distribution process, and how well the outcome aligned with the corporate product strategy;

— **information-development project plan** – assessing how manageable the project schedule was, meeting the budget, how tasks were prioritized, and the level of resulting quality and completeness;

— **staffing** – evaluating the alignment of available skills with project tasks and meeting expected productivity levels;

— **risk mitigation** – the ability to overcome risks and the effectiveness of mitigation plans;

— **information reviews** – evaluating the timeliness and robustness of content reviews and the resulting level of technical accuracy;

— **translation** – assessing the process for vendor selection, accuracy of cost estimations, and resulting quality of the translation; and

— **information-product delivery** – evaluating the processes for information-product delivery, accommodating customer expectations with formats, translation, and medium.

Annex A
(informative)

User and task analysis

A.1 User profile analysis

The following describes some components of a user and task analysis. However, in addition to a formal user and task analysis, considerable information about users' information needs is also obtained from user surveys, user comments on online information, social media reports, and information gained through website analytics.

A representative number of users should be selected for a needs assessment. The number of users that need to be profiled to provide enough information for task analysis and to start seeing trends during analysis should be analyzed. The users chosen should either represent a group of end users or should be the actual end users.

A.2 Determining user demographics

A balanced cross section of those users should be selected to study. The following are representative categories to consider:

— user location — domestic and international users;

— organization size — small, medium, large organizations with multiple divisions or enterprises;

— user variety — internal organization users, external users (customers), partners, and any other specific user types;

— user product experience — novice, experienced, and expert users;

— industries — automotive, consumer products, medical, etc.;

— cultural — different cultures or geographies; and

— language — business and native languages spoken.

A.3 Identifying users to interview

Methods and avenues to identify users to interview or observe concerning their information needs should be defined, using the following resources:

— internal departments that have contact with users;

— attendance at trade shows and conferences to find users willing to participate in interviews;

— help desk personnel who have user contacts;

— marketing and sales departments that have customer leads; and

— internal users of the product.

A.4 Establishing user profiles

Once users are identified, user profile research should be conducted. If the users are associated with business customers of the organization, an overview of the users' businesses environment should be developed using information about the following:

— the businesses that the users' organizations are engaged in;

— the locations of the users' organizations;

— the size range of the users' organizations;

— the importance of the products to the users' functions; and

— the number of products in use at the users' locations.

If the users are themselves consumers, an overview of the users' general environment should be developed using information about the following:

— the range of users who purchase the product;

— the locations in which the users use the product;

— the variety of purposes that the users might have in using the product; and

— relevant general characteristics of the users, such as age, education, location, physical characteristics, and others as relevant.

A.5 Developing user personas

A diverse set of user personas should be developed to ensure diversity when choosing users to interview and observe. The personas should be shared with the interview and observation teams.

Developing personas is crucial because users across different demographics have different needs and requirements.

A.6 Analyzing the user environment

User environment analysis is the process of gathering information on the user’s work environment through site visits and interviews. Several analysis methods support environment analysis. Some methods are not possible for cost or security reasons.

A.6.1 Types of environments

The types of users’ work environments should be defined. For example, the user environment for lawn mower information can be the user’s garage or yard. The users' work environments can determine the way information is delivered as well as the type of information required for successful performance.

If allowed, photographs of the users' environment provide context.

A.6.2 Descriptions of the users' environment

Visual descriptions of the user environments and observations of the work area should be developed.

The environment descriptions vary widely depending on the type of work being performed. The observers should focus on elements of the environment that constrain the use of the various media in which information can be conveyed.

EXAMPLE Some organizations restrict user access to computers that are able to communicate outside the restricted environment.

A.7 Analyzing user tasks

Task analysis is the process of examining the steps to complete work. Task analysis considers the user goals and tasks. The following activities should be supported:

— determine the data presentation and analysis method used to perform task analysis;

— select a method that advances the information-development team's understanding and decisions; and

— collaborate with team members to achieve a consensus about what has been learned during task analysis.

User tasks should be captured, including high-level workflows to detailed task descriptions. Methods of capturing user tasks include the following:

— workflow diagrams outlining major user tasks or large activities;

— sequence of tasks that show the order in which tasks are performed;

— task hierarchies that show dependencies between tasks;

— role/task matrices that show which users perform which tasks;

— detailed task descriptions that also show objects, actions, and decisions;

— task flowcharts that include inputs and outputs;

— task scenarios that use real-world examples; and

— tasks derived from the product features or functions.

The manager should explore possible data presentation methods. The data presentation methods selected should closely align with project goals. More than one presentation method helps to diversify the analysis and is a means to verify conclusions.

A user/task matrix identifies the relationship between types of users and the tasks that they might perform.

Understanding the tasks users perform and the goals they hope to achieve in performing those tasks inform the task analysis and lead to improved information design. Analysis directly leads to design decisions and strategies to guide content development. Examples include content hierarchy, scenario development, and work processes.

Annex B
(informative)

Project plan example

B.1 Project title

Introduction to DITA (Darwin Information Typing Architecture)

B.2 Date of issue and revision status

January 1, 2020 First draft

B.3 Information goals

The goal of this project is to support new users in learning how to author in the OASIS DITA Standard. The manual will be designed as a series of tutorials, enabling the new users to practice implementing each feature of the DITA Standard. The new users will learn the basic structures of the standard and know when and how to implement each element and attribute of the standard. This project will provide essential information that will enable organizations to train new users and to support their implementation of the DITA Standard.

B.4 Project scope

The scope of the Introduction to DITA project will focus on the information required for an author developing structured content in DITA XML. Additional information will be provided to enable an author or an information architect to prepare an information model that limits the elements and attributes to be used in the organization. Basic information on the DITA Open Toolkit and the process of creating appropriate output from the source content will also be provided.

B.5 Audience profile

It is anticipated that the primary user of the Introduction to DITA will have had no previous experience using XML as an authoring system nor using the DITA Standard. The user has previous experience as a technical author, but does not necessarily have experience creating structured information. It is expected that the users will be unfamiliar with the concept of the topic and the information type.

B.6 Content to be developed

All topics for this first edition will be new topics, as shown in Table B.1. Re-use is not being considered.

Table B.1 — Sample Annotated Topic List

Topic	Information type	Reuse
Understanding information types	concept	
Concept information type	task	
Structure elements	reference	
Concept elements	reference	
Task information type	task	

Table B.1 *(continued)*

Topic	Information type	Reuse
Reference information type	task	
Understanding elements	concept	
… and so on.		

B.7 Accessibility requirements

Alternative descriptions of all illustrations will be included in the e-book output to enhance accessibility. The e-book output will be developed so that it can be accessed on multiple device formats. All information will conform with the following:

— ISO/IEC 40500:2012, *Information technology — W3C Web Content Accessibility Guidelines (WCAG) 2.0*

— ISO 9241-171:2008, *Ergonomics of human-system interaction — Part 171: Guidance on software accessibility*

— ISO 9241-20:2008, *Ergonomics of human-system interaction — Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and service*

B.8 Translation and localization requirements

The Introduction to DITA will be translated into Japanese. The original XML DITA files will be communicated to the localization service provider in Japan as soon as the final review and approval is complete.

B.9 Project deliverables

The primary deliverable for this project is the finished printed manuscript of the Introduction to DITA. The second deliverable will be the e-book version. Included on the corporate website will be the sample files that will be used in the exercises.

B.10 Tools requirements

This project will be written in DITA XML using the standard editing tools in the organization. All files will be stored in the component content management system. The final PDF production will use the AH system to enhance the DITA Open Toolkit output. The e-book will be produced using the EBook system. All reviews will take place using the review workflow of the component content management system.

B.11 Information reuse strategy

The project tutorial lessons will reuse instructional content to ensure uniformity of instructions.

B.12 Risk assessment

Risks have been evaluated (see Table B.2).

Table B.2 — Sample Risk assessment

Risk	Severity	Probability	Risk Mitigation	Severity with Mitigation
If one or more writers leave during the project, work will be delayed until a replacement writer is recruited and trained	Medium	High	Normal employee incentive and compensation schemes are in place. A relationship is in place with staff recruitment professionals	Medium
If the DITA standard is not frozen on schedule, information will need to be rewritten or work will be delayed pending final requirements	Medium	Medium/ Low	Information-development team reviews project status weekly with the software development manager. Writers are reassigned to other work pending approval of software requirements	Low

B.13 Schedule

This project is scheduled to be completed by December 31, 2020. Details of the schedule are as follows:

— Complete first draft – March 1

— Complete second draft – June 1

— Usability testing – July 1

— Initial production, indexing – September 1

— Final approval – October 1

— Printing and e-book construction – December 1

— Shipping – December 31

B.14 Estimated project size

We anticipate this guide to be between 350 and 450 pages. We expect approximately 250 topics, including concept, task, and reference topics.

B.15 Estimated project budget

Based on standard hourly rates for writers, information architect, and project manager, we anticipate a budget for this project of between $70 000 and $100 000.

B.16 Project team members

Team members include the following:

Team lead – Jane

Information architect – Louise

Writer – Sam

Writer – George

Tester – Beverly

B.17 Project reviewers and approvers

The project topics under development will be reviewed by all members of the project team. Dr. H will conduct the review.

Annex C
(informative)

Translation management

C.1 Languages and dialect

FIGS (French, Italian, German, and Spanish) are the most commonly translated European languages. For some organizations or industries, Asian languages such as Japanese, Chinese, and Korean can be the most common.

It is less expensive if a single dialect is used in all geographies, but whether that is acceptable depends upon the audience, customer, industry, and domain of knowledge. A single more dominant dialect can be acceptable for professional audiences and technical domains. For example, a relatively common practice is to translate into only Parisian French (not Canadian French) and use that Parisian French translation in Canada, Belgium, Switzerland, and all other French-speaking countries. Similarly, the Castilian dialect of European Spanish is acceptable throughout Spain and even in Latin America, but only for professional and technical audiences. European Portuguese is sometimes acceptable in Brazil. On the other hand, for consumer or lay audiences the local dialect can be required, especially for safety warnings, messages, and advisories.

C.2 CE mark

As part of determining what languages are required, the manager or responsible party should collaborate with other groups in the larger organization to determine whether the target countries or the target customers require the CE mark, and if so, whether each of those countries has a local language law. One of the requirements for CE mark approval is that if a country has a local language law, information translations are required to sell in that country. Some countries' laws also require user interfaces to be in the local language. In the European Union alone more than 26 countries have local language laws. In a few cases, local languages are required only for consumer or lay audiences, whereas most require local language information for professional audiences as well.

C.3 Alphabets and character sets

Many European languages including English use “Latin” script in which each character is represented in a single byte. The Cyrillic alphabet is also represented in a single byte, although it is an entirely different alphabet used in many languages, including Russian, Bulgarian, and Romani, as well as in Uralic, Iranian, Mongolian, and Turkic languages. Some languages have so many characters that they require two bytes to represent all the characters, so they are sometimes referred to as double-byte languages.

Furthermore, some Asian languages use pictographs rather than phonetic characters, or even combinations of traditional pictographs with other writing systems such as Kanji, Hiragana, and Katakana.

C.4 Fonts

For most character sets, a number of different fonts are available. Typically, fewer fonts are available for double-byte languages and for languages with a relatively small number of speakers.

Publishing systems that use the Unicode standard and XML simplify the task of managing multiple character sets.

C.5 Right-to-left or bidirectional languages

Languages that are read from the right to the left rather than left to right create additional requirements for translation systems and publishing systems. Such languages are sometimes referred to as "bidirectional" languages because technical terms and some other words will remain in a source language that runs left to right.

Right-to-left languages include the following:

— Arabic; and

— Hebrew.

C.6 Vertical languages

Some languages, including Chinese, Japanese, and Korean, are traditionally read top to bottom rather than horizontally across the page. This convention poses additional requirements for translation and publishing systems. For technical translations, it is sometimes acceptable to publish these languages horizontally instead of vertically, but the manager or responsible party should verify whether horizontal publishing is acceptable for the audience.

C.7 Sort order for indexes and glossaries

Sort order (also called collation) is an important translation requirement to support functionality such as automated indexes and glossaries. Different languages not only use different characters, they also differ in alphabetical collation, which is the order in which the characters appear in their alphabets. As a simple example, in Spanish the letter ñ (n with a tilde) appears after the letter n.

C.8 Units of measure

Most countries use the metrics units of measure. Fewer, such as the United States, use Imperial units of measure (feet, pounds, miles). Additionally, some industries use unique units of measure, such as the use of the “French” measuring system for the diameter of medical leads or wires. Consequently, units of measure should be selectable by the user.

C.9 Timing

Timing is often dictated by product releases. Some organizations strive to release products worldwide simultaneously, while others release in phases by region or country. Resource constraints or regulatory requirements can prevent simultaneous releases.

Some countries require completed translations to be registered or even approved before products are sold in that country, at least for certain industries. Other countries simply require translated information to accompany products. In such cases, the organization releases a product as a separate step from release in particular countries or regions.

In developing strategies and plans, the manager or responsible party should take into consideration that it is more efficient and less expensive to manage translation projects for all languages or a group of languages versus running individual translation projects for each language. However, handling languages completely simultaneously risks that problems with some languages will delay the completion of other languages.

C.10 Selecting translation and localization approaches and services provider(s)

Translations tend to be managed internally in large organizations, in organizations with a large amount of content and high frequency for translations, in situations where content is competitive intellectual property, and in situations where the accuracy and quality of content is especially important.

Translations tend to be distributed in less experienced organizations, for languages used by countries that require extensive country-unique localization, for languages that are new to an organization, and for languages with a small number of speakers.

Some organizations divide languages into various tiers. For example, some organizations translate all content into some languages, while translating less content into others. These tiers can be based on market priorities, regulatory requirements, whether customers are likely to be able to read the source language or another provided language, or other factors.

Types of translation and localization services include the following:

— translation: Translating from a source language into one or more target languages. This service is the one people most often think of as localization services;

— localization: Adapting content and software for local requirements, culture, and practices;

— internationalization: Ensuring that source content is optimized for translation and localization, including factors such as enabling preferences for date, time, number, and currency formats;

— file conversions and file management;

— quality assurance;

— testing of localized content, such as user interfaces and integrated user assistance; and

— electronic publishing: producing "camera-ready" or "publishing ready" content, such as in PDF or HTML.

Factors to consider in selecting localization service provider(s):

— required and desired services;

— performance;

— quality system(s), including compliance with ISO 17100:2015, *Requirements for translation services*;

— proficiency in the use of standards such as Unicode;

— service provider's proficiency in the use of compatible tools and technology;

— proficiency in the use of translation tools;

— familiarity with and training in the knowledge domain and users;

— location(s);

— any additional requirements the organization has for vendors and service providers; and

— cost.

NOTE See 11.3 “Translation cost estimates” for details.

C.11 Translation cost estimates

In some organizations, translations are funded entirely or partially by the countries and regions that use those languages, whereas in others translations are funded entirely or partially by other central organizations, such as sales, marketing, customer service, or development.

The costs for translation and localization services vary widely depending on many factors, particularly volume. Some organizations translate billions of words per year into dozens of languages, while at the other end of the scale other organizations translate hundreds of words into only a few languages. For example, translating into FIGS is a common practice for many organizations and a first translation step for many. Translating into Asian languages including Japanese and Chinese is common for highly technical products. A first-time translation can cost as much per language as it costs to write the source language.

Translation costs are often quoted as per word or per page costs. Per page costs usually assume 200 words per page. Translation estimates usually break out post-translation page composition (sometimes called "desktop publishing") as a separate expense. A significant percentage of translation costs can be for post-translation page composition. Therefore, use of XML with DITA or another XML authoring environment has the potential to save substantial costs for translation. In addition, organizations with substantial re-use can save costs by using translation memory tools, especially if those tools are used internally.

Factors that affect cost include the following:

— whether content has been previously translated or an existing schema exists. In that case, translation is significantly less expensive because only the changes need translation;

— number of languages, including each dialect as a separate language;

— whether the agency or the organization is responsible for quality reviews;

— labor costs where the translation is performed.

C.12 Automation

The ability to automate content development and publication will also affect costs:

— whether the content is formatted within the content itself (for example, with desktop publishing) versus content using XML with DITA or another format-free authoring environment, and using a transform or formatting specification;

— amount of re-use, including conditional text;

— automation of re-use through a CCMS;

— whether the CCMS enables updates to content to be processed without re-translating the entire content collection;

— whether automated indexes, tables of contents, etc., have been implemented. See Note 1 below.

— whether the same provider will translate and localize both the user interface and the information for users.

NOTE 1 If these content elements that include page numbers or other reference systems are not automated, some organizations rely on page-true translations, which means the same page number contains the same content in every language. Page-true translations require more effort and time than automated publishing, because page-true translations rely on manual interventions such as reducing font size or additional inserted pages with letters as well as numbers, for example page 11a and 11b between pages 10 and 12.

NOTE 2 If different providers handle the information for users and the user interface, the provider supplying information for users needs timely access to user interface translations in order to incorporate translated screen captures.

C.12.1 Controls

Managers may apply various measures to control the quality and cost of translation:

— consistency and cleanliness of source-language files;

— careful use of predefined terminology;

— whether proprietary technical terms stay in the source language;

— clarity or lack of ambiguity in content;

— number of change rounds;

— good control of content versions and revisions; and

— application of Standard Technical English (STE) or other controls in the source language.

C.12.2 Graphics

Graphics can impact translation effort in various ways:

— ratio of text to graphics and whether graphics contain textual content that needs to be translated;

— number and types of graphics. Do the graphics include text that will require more space when translated due to language expansion? If so, will the text boxes and therefore graphics automatically resize when translated?

— whether the CCMS automatically processes the text and graphics; and

— whether screen captures require translation.

NOTE 1 Using Scalable Vector Graphics (SVG) enables automating the translation of text in graphics.

NOTE 2 If information for users is translated into more languages than the user interface, the responsible party determines in what language the user interface screens will be displayed.

NOTE 3 As is the case with all translated user interfaces, the provider of translations and localizations needs timely access to the translated screens.

C.13 Translation memory ownership

The ownership of the translation memory is affected by whether the content is considered competitive intellectual property. If so, the organization will need to include nondisclosure agreements in the contract with the localization service provider. Also, the organization should consider developing a contract requiring that the localization service provider does not use the translation memory for other clients. Furthermore, ownership of translation memories grows in importance as translation volumes increase.

Alternatively, using translation memories from other organizations can lower the corporation's costs and improve quality by promoting consistent terminology within the industry. Furthermore, some service providers are not able to maintain many different translation memories. It is also more time-consuming and complicated for service providers to maintain separate translation memories for different organizations, so they charge more if doing so is required.

If the content includes critical intellectual property, or if the volumes are large, the organization should consider potential future needs. At some point, it might be necessary for the organization to switch translation service providers or use additional translation service providers.

At the same time, service providers sometimes need a sufficient volume or total revenue before agreeing to a contract or service level agreement that requires them to share translation memories with their competitors or the client. Incompatibilities between translation systems also limit the ability to share or transfer translation memories.

C.14 Terminology management

Note that a term can be a single word or multiple words that together communicate a concept. For example, consider the title of this section, Terminology management. The word "terminology" is a term, and the word "management" is a term, each of which communicate a concept. In addition, the two words together communicate another concept, one more specific than the word "management" alone, and more than or different from "terminology" alone. A term is equal to a concept.

To improve quality and control costs, some organizations can take measures to manage terminology in the source language. English in particular contains more words than other languages, including alternative words with different connotations. Therefore, to enable usability and clarity terms should be used consistently. By promoting or enforcing consistency, terminology management helps to reduce ambiguity, thus making it easier for translators to know what concept is meant by a particular term in context. This consistency benefits readers in all language.

Most automated translation tools integrate mechanisms for managing terminology, and increasingly authoring systems use them as well.

C.15 Machine translation

Machine translation (MT) is the use of software to translate content from a source language to a target language. MT systems use statistical models or an interlingua, which is an intermediate representation of the content separate from any language, to provide translation from a source language to target languages. The quality of machine translations has been improving rapidly as the demand for translations increases. Although quality is improving, machine-translated content rarely reads as though written by a native speaker. Sometimes machine translation is used in combination with post-editing by a human translator, especially for applications in which accuracy is important.

Machine translation is also sometimes used in combination with translation memory systems to translate content that has not been translated before.

Machine translation can be useful in the following cases:

— applications where understanding only the gist of the content is acceptable;

— very large volumes of content; and

— content that needs to be made available in multiple languages quickly, such as for error messages, notices of immediate problems, and safety alerts.

C.16 Writing for translation

Writing for translation can help to reduce translation costs, speed up the translation cycle, and improve the quality of the source as well as the translated content. Terminology management is a first step. Information developers should use standard terminology when standard terms exist within an industry or field. Further, information developers should use terms consistently: a single term should be used for a concept throughout the information. If an information developer uses more than one term for the same concept, translators (as well as other readers) might wonder whether a new concept has been introduced. Further, information developers should not use the same term for more than one concept.

Beyond terminology management, one of the main strategies is to reduce or eliminate ambiguity in the source language, which can be in English or in another language. Word choice is important. For example, the English word "since" can mean either "because" or "after." In writing for translation, the words "because" and "after" are not ambiguous, so it is better to use one of them rather than the word "since." Ambiguity also arises when one of two or more compound nouns or compound verbs has a modifier. For example, consider the phrase “the purple pen and paper.” It is not clear whether the paper is purple. This ambiguity can be corrected either by reversing the order of the nouns (the paper and purple pen) or by repeating the modifier (the purple pen and the purple paper).

Reducing or eliminating ambiguity benefits readers/users in the source language as well as in the translated languages. A lack of ambiguity is particularly important because many people need to read information that is not in their first or native language, which is usually more difficult than reading content in one's native language. If a word has multiple meanings, it will not be the best word choice, especially if the context does not help to clarify the term's meaning.

In addition, the following writing practices should be followed to improve the readability and translatability of text.

— avoid contractions (such as don't for do not). They are slightly more difficult for translators, and some languages do not include contractions;

— use active voice;

— use simple terms whenever possible and appropriate; and

— ensure actions are expressed as verbs, not nouns. The suffixes –ment and –tion are clues that an action may have been transformed into a noun, making a sentence longer and harder to read. For example, instead of using "The commencement of the meeting will happen at 5:00 p.m.," rewrite as follows: "The meeting will start at 5:00 p.m."

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Abstract and keywords

This document specifies requirements and procedures for managing information for users throughout the software-, services-, and systems-development life cycle. It applies to people or organizations producing suites of information, to those undertaking a single information-development project, and to information produced internally, as well as to information contracted to outside service organizations. It provides details of the information-development and project-management processes and also presents aspects of strategic planning and translation management that managers apply. It covers management activities related to starting a project, building a team, and managing information through the translation and localization process. It addresses productivity and quality measurements needed for management control. This document is independent of the software tools that may be used to produce or manage information for users and applies to both printed, embedded, and mobile information. Much of its guidance is applicable to information for users of systems of hardware as well as software, systems, and services.

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