

Task Knowledge Skill (TKS) Statements Authoring Guide for Workforce Frameworks

Working Draft

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INCLUDES UPDATES AS OF 7-22-2021; SEE PAGE I



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Errata

The below table identifies changes that have been incorporated into the TKS Authoring Guide working draft. Errata updates may include corrections, clarifications, or other minor changes in the publication that are either *editorial* or *substantive* in nature.

Date	Type	Revision	Page
7/22/2021	Editorial	Updated Page Numbers so that main content starts on Page 1	Throughout
7/22/2021	Editorial	Added numbering to headings for easier navigability.	Throughout
7/22/2021	Editorial	Updated Table of Contents	i
7/22/2021	Editorial	Added page break to separate Table of Contents and Errata from body content	i
7/22/2021	Editorial	Added Errata table	i
7/22/2021	Editorial	3: Changed “To” to Uppercase in the Heading	2

Date	Type	Revision	Page
7/22/2021	Editorial	3.2.3: Delete the following content: For example: <ul style="list-style-type: none"> • Knowledge Statement 1: “Knowledge that a data element is the smallest named item of information that conveys meaningful information.” • Knowledge Statement 2: “Knowledge that data elements exist in both physical and digital form.” 	4

1 Introduction

This guide is intended to support the creation of Task, Knowledge, and Skill (TKS) statements in workforce frameworks.¹ As a common, consistent lexicon, a workforce framework improves communication about how to identify, recruit, develop, and retain talent. When applied, a workforce framework model describes and shares information about a defined area of work (e.g., cybersecurity or privacy), expressed via core building blocks: Task statements that define the work to be done and Knowledge and Skill statements that describe what a learner—including students, job seekers, and employees—must possess to perform that work. A workforce framework offers benefits to:

Employers: A consistent workforce framework model enables the establishment of regular processes—from hiring to training and assessment—for multiple fields and roles in the organization. Multiple frameworks may be applied to represent the various types of work that is needed to support the organization.

Education and Training Providers: Workforce frameworks provide direct information about what a workforce needs to know in order to successfully complete defined tasks, as well as share information about the knowledge and skills necessary to complete those tasks. Having a standard model across multiple frameworks enables a consistent way to develop learning across fields and helps in the development of credentials such as degrees, certificates, certifications, badges, and other verification techniques to consistently describe learner capabilities across fields and in roles that may pull from multiple domains.

Learners: Workforce frameworks provide a common lexicon to describe work roles or competencies. By standardizing this language, workforce frameworks can help students who are interested in learning about a particular career, people looking for a new job or to change job roles, and workers who are looking to demonstrate or increase their competencies.

Finally, consistent use of a workforce framework's TKS statement as building blocks enables communication at a peer level, sector level, state level, national level, or international level. This communication can drive innovative solutions to common challenges, lower barriers to entry for new organizations and individuals, and facilitate workforce mobility.

This publication is meant to be used as a guide in the creation of new workforce framework TKS statements as well as for those who are in the process of reviewing existing statements.

¹ This guide was developed using the NIST [Workforce Framework for Cybersecurity \(NICE Framework\)](#), Special Publication 800-181, Revision 1 structure as a model for how a workforce framework is defined. It is the result of a collaborative effort with the NIST [National Initiative for Cybersecurity Education \(NICE\)](#) and [Privacy Engineering Program \(PEP\)](#).

2 What Are Task, Knowledge, and Skill (TKS) Statements?

TKS statements are the core building blocks of a workforce framework model. This building block approach encourages interoperability and flexibility in how a workforce framework can be used and applied. Using this model across multiple workforce frameworks provides extensibility and scalability—enabling multiple frameworks, for instance, to reference the same statements when pertinent to more than one field of work.

TKS Definitions

- **Task:** An activity that is directed toward the achievement of organizational objectives.
- **Knowledge:** A retrievable set of concepts within memory.
- **Skill:** The capacity to perform an observable action.

Every organization executes common tasks as well as some context-unique tasks. A workforce framework provides organizations a way to describe their work through Task statements. Similarly, a workforce framework provides a way to describe learners via Knowledge and Skill statements. The workforce framework further associates Task statements with the Knowledge and Skill statements a learner needs to complete the task. At their core, the statements can be defined as:

- **Task statements:** Describe the work to be done; they represent a collection of associated concepts and actions defined by Knowledge and Skill statements.
- **Knowledge statements:** Describe a retrievable set of concepts within a learner’s memory—that is, what a learner knows.
- **Skill statements:** Describe what the learner can do.

As noted in the introduction, a workforce framework can be used by learners, employers, and training and education providers. Suggestions on how to implement the TKS building blocks to support each audience’s goals are typically included in the workforce framework but are out of the scope of this guide. See the “Applying TKS Statements” sidebar for more information on some common applications.

Applying TKS Statements

A workforce framework building block approach enables agility, flexibility, interoperability, and modularity. The statements can be used in a variety of ways, including for:

- Competencies
- Work Roles
- Teams

They can be applied to assist in learner and workforce assessment, in recruiting and hiring processes, and in learning and professional development. For more, see the NICE Framework as an example.

3 How To Draft Task, Knowledge, and Skill (TKS) Statements

The sections below identify general principles that apply to each of the TKS building blocks, followed by specific guidelines for drafting each individual type of statement.

3.1 General Principles

TKS statements are governed by the following general principles:

- **Flexible:** The statements can be applied or combined in various ways to address different local circumstances and needs.
- **Consistent:** The statements are drafted following common guidelines outlined in the sections below to ensure that they align with other statements in the building block category and can be used in a uniform manner.
- **Clear:** The statements are easy to read and understand, and not overly complex or lacking clarity.
- **Affirmative:** The statements are structured in an affirmative (i.e., grammatically positive) form to assist with the design and evaluation of performance metrics and goals and to minimize issues with language translation for organizations that work with multi-lingual teams. This is in contrast to grammatically negative statements that use language such as “do not” or “avoid.”
- **Discrete:** The statements should not include more than one (compound) idea (see the following sections for more examples of this principle).

Task

An activity that is directed toward the achievement of organizational objectives.

Task Statements

- Begin with the activity being executed
- Are directed toward the achievement of organizational objectives
- Include only one task in a single statement

3.2 Creating Task Statements

Task statements describe the work to be done. The Knowledge and Skill statements associated with each task can then be used to provide a learner with more detailed insight into what is needed to complete the tasks.

Tasks are defined as activities directed toward the achievement of organizational objectives, although the statements themselves do not contain the task objective. This approach supports clearly defined Tasks that can be readily understood. Task statements should:

3.2.1 Begin with the Activity Being Executed

Task statements start with a verb that defines how to execute the task.

EXAMPLES

Correct Task Statement: Identify organizational privacy compliance obligations.

Incorrect Task Statement: Ensure that organizational privacy compliance obligations are identified.

Rationale: Starting a Task statement with the verb “ensure” transforms it from a task to an organizational objective. In addition, the verb “ensure” may create confusion around whether the task is categorically necessary to fulfill and introduces vagueness in how to determine responsibility for actually performing the task.

3.2.2 Be Directed Toward the Achievement of Organizational Objectives

Task statements should be associated with one or more organizational objectives, indicating why a task exists at the organization. However, the statements themselves do not contain the objective, as these may vary based on mission drivers and organizational needs.

EXAMPLES

Correct Task Statement: Conduct interactive training exercises.

Incorrect Task Statement: Conduct interactive training exercises to create an effective learning environment.

Rationale: Here, the objective is to create an effective learning environment. However, organizational objectives should not be included in a Task statement in order to give organizations the flexibility to apply the task to meet their specific needs. In addition, if a Task statement includes an organizational objective, an organization may interpret that objective as the sole reason to conduct the task. In this example, for instance, an interactive training exercise could serve numerous purposes, only one of which may be to create an effective learning environment.

3.2.3 Include Only One Task in a Single Statement

By clearly defining the work, Task statements offer more utility than vague, overly complex, or overloaded tasks that can make it difficult or time-consuming for organizations to determine how to execute them. Additionally, clearly defined statements minimize conflicting interpretations of the work within an organization's workforce or with external service providers who may need to collaborate with the organization to execute the task.

EXAMPLES

Correct Task Statement: Identify organizational data elements.

Incorrect Task Statement: Identify, classify, or document organizational data elements in physical or digital form.

Rationale: As written, the incorrect Task statement contains multiple activities (i.e., identify, classify, document) that should be broken down into three discrete Task statements, one for each activity:

- Identify organizational data elements.
- Classify organizational data elements.
- Document organizational data elements.

Note that the correctly written Task statement can then be associated with Skill and Knowledge statements to provide additional guidance or help define key aspects of the work to be done.

3.3 Creating Knowledge Statements

Knowledge statements describe a retrievable set of concepts within a learner’s memory—that is, what a learner *knows*—as compared to Skill statements, which represent what a learner *can do*. The Knowledge statement may represent knowledge across a continuum, from general to specific. A Knowledge statement representing general knowledge can provide organizations with flexibility to interpret and apply the concept to their unique contexts. A Knowledge statement representing specific knowledge can provide guidance to organizations that may lack institutional expertise or experience with particular topics.

Knowledge

A retrievable set of concepts within memory.

Knowledge Statements

- Begin with “Knowledge of” followed by a concept
- Are limited to one concept in a single statement

A single Knowledge statement may be used to complete many different Tasks; likewise, multiple Knowledge statements may be associated with a single Task. Knowledge statements should:

3.3.1 Begin with “Knowledge of” Followed by a Concept

Beginning the statement in this way makes it immediately recognizable as a Knowledge statement and adds clarity.

EXAMPLES

Correct Knowledge Statement: Knowledge of vulnerability information dissemination sources (e.g., vendor alerts, government advisories, product literature errata, and sector bulletins).

Incorrect Knowledge Statement: Vulnerability information dissemination sources (e.g., vendor alerts, government advisories, product literature errata, and sector bulletins).

Rationale: Including the “Knowledge of” phrase distinguishes the statement from being a task or skill statement.

3.3.2 Be Limited to One Concept in a Single Statement

An individual Knowledge statement should not merge two knowledge concepts. Limiting the statement to one concept keeps it concise, understandable, and flexible, as well as more easily supports training and assessment goals.

EXAMPLES

Correct Knowledge Statements:

- Knowledge of computer programming principles.
- Knowledge of software debugging principles.

Incorrect Knowledge Statement: Knowledge of computer programming and software debugging principles.

Rationale: A Task may or may not depend on the knowledge of both of these principles. However, treating them as distinct knowledge concepts provides organizations with more flexibility; they can be added as separate requirements or grouped together or in combination with other statements as needed.

3.4 Framing Skill Statements

Skill statements describe what the learner *can* do—as opposed to Knowledge statements, which describe what a learner *knows*. The skills described in a skill statement can range from simple to complex skills. At times the skill may be very simple and straightforward, whereas other skills may represent complex, potentially multi-step processes. A single Skill statement may be used to complete more than one Task. Likewise, multiple Skill statements may be needed to complete a single Task. Skill statements should:

Skill

The capacity to perform an observable action.

Skill Statements

- Begin with “Skill in” followed by a verb
- Represent observable actions
- Include only one skill in a single statement

3.4.1 Begin with “Skill in” Followed by a Verb

Beginning the statement in this way makes it immediately recognizable as a Skill statement and adds clarity, while the verb defines what action to take.

EXAMPLES

Correct Skill Statement: Skill in preparing test and evaluation reports.

Incorrect Skill Statements:

- Skill in test and evaluation reports.
- Preparing test and evaluation reports.

Rationale: In the first incorrect example above, the statement starts with “Skill in” but omits the verb that indicates the action to be taken, introducing confusion—there may be multiple skills associated with test and evaluation reports (e.g., creating, conducting, assessing). While the second incorrect statement includes the verb “Preparing,” by excluding “Skill in” at the start it renders the statement less recognizable as a Skill statement and, further, transforms what should be a skill into a task.

3.4.2 Represent Observable Actions

Skill statements represent actions that are observable as opposed to the Knowledge statements, which are conceptual. This can assist in evaluation.

EXAMPLES

Correct Skill Statement: Skill in applying security controls.

Incorrect Skill Statement: Skill in structured analysis principles and methods.

Rationale: The incorrect example shown here is actually a Knowledge statement—it is something you may want a learner to know but cannot actually witness them knowing (though it could be assessed). The correct example is something that could be observed to determine if the person has the skill. It’s like asking someone to do a math problem; it might be something they know the answer to by rote, but they should also be able to show you the work of how they came to that conclusion. If they cannot, then they may not be skilled in applying that knowledge to other situations.

3.4.3 Include Only One Skill in a Single Statement

A Skill statement defines a single skill; for tasks that require multiple skills to be completed, multiple skill statements can be grouped. By limiting the statement to a single skill, the statement becomes more concise and clearer, as well as more flexible—in that it can be used on its own or in combination with any variety of other Skill or Knowledge statements.

EXAMPLES

Correct Skill Statements:

- Skill in designing countermeasures to identified security risks.
- Skill in designing multi-level security or cross domain solutions.

Incorrect Skill Statement: Skill in designing countermeasures to identified security risks and in designing multi-level security or cross-domain solutions.

Rationale: The incorrect statement here merges together two skills that, though they may be used together, are themselves distinct and could also be applied separately. While one organization may have one person who is responsible for both skills, it may be that a (typically larger) organization may have different staff to perform these and thereby separating the work adds flexibility to define work roles in different work environments.

4 Conclusion

This Authoring Guide provides a model to support the creation of TKS statements in workforce frameworks. The principles and rules outlined above may be applied to the initial creation of TKS statements or in the review of existing TKS statements. Newly created TKS statements can be added to an existing framework (e.g., when creating new Work Roles).

NIST welcomes and encourages feedback on this Authoring Guide. It is intended to be a “living” document and may undergo future revisions as needed based on stakeholder needs and other relevant factors. Feedback may be sent to: NICEFramework@nist.gov

5 For More Information

- More information on the NICE Framework can be found here:
<https://www.nist.gov/nice/framework>
- More information on the Privacy Framework can be found here:
<https://www.nist.gov/privacy-framework>