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# Performance-based Documentation

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**Keywords:** information, model, performance, purposes, objectives, categories, XML, SNMP, MIB

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## Abstract

This paper presents a method for designing product documentation that relates information to acceptable user performance in acquiring specific skills and knowledge. The method involves selecting, organizing, and presenting all information using a performance-based development model. The use of the model is illustrated with examples from actual projects.

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## Information purposes

Before selecting and designing document content, it is important to:

- define the intended purposes of the content
- identify how the intended purposes will be achieved
- know how the success of the intended purposes will be verified

The main purpose of product documentation is to communicate specific information to users in such a way that they will be able to demonstrate the acquisition of specific skills and knowledge.

## Generic sub-purposes

There are six main generic sub-purposes; they are, to:

- **Buy** the product
- **Plan** for product installation and use
- **Train** how to use product features
- **Install**, test, and commission the product
- **Operate** the product
- **Maintain** the product

Identifying and verifying purposes is facilitated by the use of information objectives.

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## Information objectives

In order to acquire specific skills and knowledge, the required performance, conditions, and criterion of acceptable user performance must be identified. This is achieved by the use of behavioral objectives.

A behavioral objective is a description of a performance you want users to be able to demonstrate before you consider them competent. Each objective describes an intended result of the information rather than the information structure. A clear statement of objectives also provides guidance for the selection of materials, methods, and the means for assessing information effectiveness.

Objectives have been used for many years during the preparation of instructional materials; this paper simply shows how the same approach can be used for preparing product documentation. For general guidelines on how to define effective objectives, see Mager, 1973 and Mager, 1975.

Objectives are used to relate product information and its presentation to tasks that users need to perform. The overall behavioral objective of product information is that users will be able to use the product efficiently and effectively; in order to achieve this, users will have to be motivated to learn new behaviors. To define useful objectives, certain adult learning behaviors need to be considered.

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## Adult learning and objectives

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Many adults resist learning anything new and they avoid reading! Adults try to use new systems without training or reading the appropriate documents (even when they are available and well designed and written).

In new learning situations, adults often resort to guessing how a new system will behave. This behavior is reinforced by the fact that most adults have been conditioned to have a production bias where throughput is paramount; they are expected to use new products immediately and time spent thinking and reading on the job are not generally viewed as productive behaviors. This conditioning reduces any motivation to spend time learning about anything new.

Adults must rely on their existing knowledge for interpreting and assimilating new information; this reliance can be very useful but only if the difference between existing and new knowledge is clearly distinguishable; otherwise, existing behaviors will be reinforced rather than new ones created.

These behaviors could adversely affect how quickly users will learn how to use the product. In order to minimize the possible adverse affects of these adult learning behaviors, users need:

- information presented in a way that minimizes reading and searching (for example, by use of visuals, lists, video, and context sensitivity)
- immediate feedback on task completion
- information presented in a way that links to their existing knowledge but which is clearly distinguishable from it

In order to address these needs, each behavioral objective needs to:

- define a small enough task that can be quickly assimilated so that users can receive immediate feedback on task completion
- be clearly presented so that users are aware of the criteria for successful task completion
- be part of a hierarchy of expected behaviors to provide a context for each user action (this is achieved by defining behavioral objectives for: the complete information suite; each deliverable; each chapter; and each module of information)
- use language that will be familiar to the intended users
- be phrased in a way that they can form the basis for conducting formative usability (performed on individual information modules while the document is being developed, see Kohn Kaminsky, 1992) and summative usability (performed on the complete document) to test for information product effectiveness

## Project examples

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Table 1 presents a number of examples from actual projects that illustrate the use of information purposes and objectives.

**Table 1. Product information purposes and objectives**

Document type	Purpose	Behavioral objectives <i>Users will be able to do the following:</i>
Introducing the product	Buy Plan Install Train Operate Maintain	<ul style="list-style-type: none"> <li>• State the purpose of the product</li> <li>• List the main components of the product</li> </ul>
Sales and Ordering Guide	Buy	<ul style="list-style-type: none"> <li>• Describe the main product features and their value</li> <li>• Complete an ordering form</li> </ul>
Planning Guide	Plan	<ul style="list-style-type: none"> <li>• List the main components of the product</li> <li>• Draw a diagram that shows product relationships</li> <li>• Write a brief description of product</li> <li>• Draw a diagram of the product architecture</li> <li>• Locate and list the available information products</li> <li>• Complete a sample planning exercise</li> </ul>
Installation Guide	Install	<ul style="list-style-type: none"> <li>• Identify main hardware and software components</li> <li>• Locate and list the available information products</li> <li>• List the main installation tasks</li> <li>• List the installation equipment and tools required</li> <li>• Start-up the product</li> <li>• Verify correct installation</li> </ul>
User Guide	Train Operate Maintain	<ul style="list-style-type: none"> <li>• Locate and list the available information products</li> <li>• Identify main hardware and software components</li> <li>• Monitor product-related activity</li> <li>• Capture and organize data logs</li> <li>• Identify common alarms and failures</li> <li>• Execute troubleshooting procedures</li> <li>• Locate and repair or replace faulty components</li> </ul>

## Information categories

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Identifying your users, the tasks they perform, defining behavioral objectives, and testing for the effectiveness of each information module is of little use if the right information for specific users can not be found when they need it. The structure of the information must be mapped to user tasks and information provided at the appropriate point during task performance. This can be achieved by categorizing the objectives defined to test for competent task performance and, where appropriate, providing context-sensitive information directly from the user interface.

I have identified four main generic, hierarchically-related, information categories:

- *users* (associates information with specific types of users)
- *purposes* (associates information with its intended use by users)
- *tasks* (associates information with the tasks that have to be performed by users)
- *primitives* (associates information with the type of information needed by users)

The hierarchical relationships are: *users* is the parent of *purposes*; *purposes* is the parent of *tasks*; and *tasks* is the parent of *primitives*.

### Users and purposes categories

The *users* category enables information to be associated with the information needs of users and could be used as the entry level for the other categories from either the product API (application programming interface) or a Web browser.

The *purposes* category enables information to be associated with its intended use.

The generic sub-categories identified for *users* and *purposes* are: *buy, plan, train, install, operate, maintain*. Each user sub-category is defined in terms of what other information categories it can contain (see Figure 1).

### Tasks category

The *tasks* category enables information to be associated with user tasks. Sub-categories for *tasks* are defined by grouping similar objectives together; the identified generic sub-categories are: *operate, configure, describe, monitor, test, order, plan, bill, replace, group, sort, install*.

### Primitives category

The *primitives* category enables information to be associated with the type of information needed by users; the identified generic types are: *messages, alarms, services, hardware*.

### Information tagging

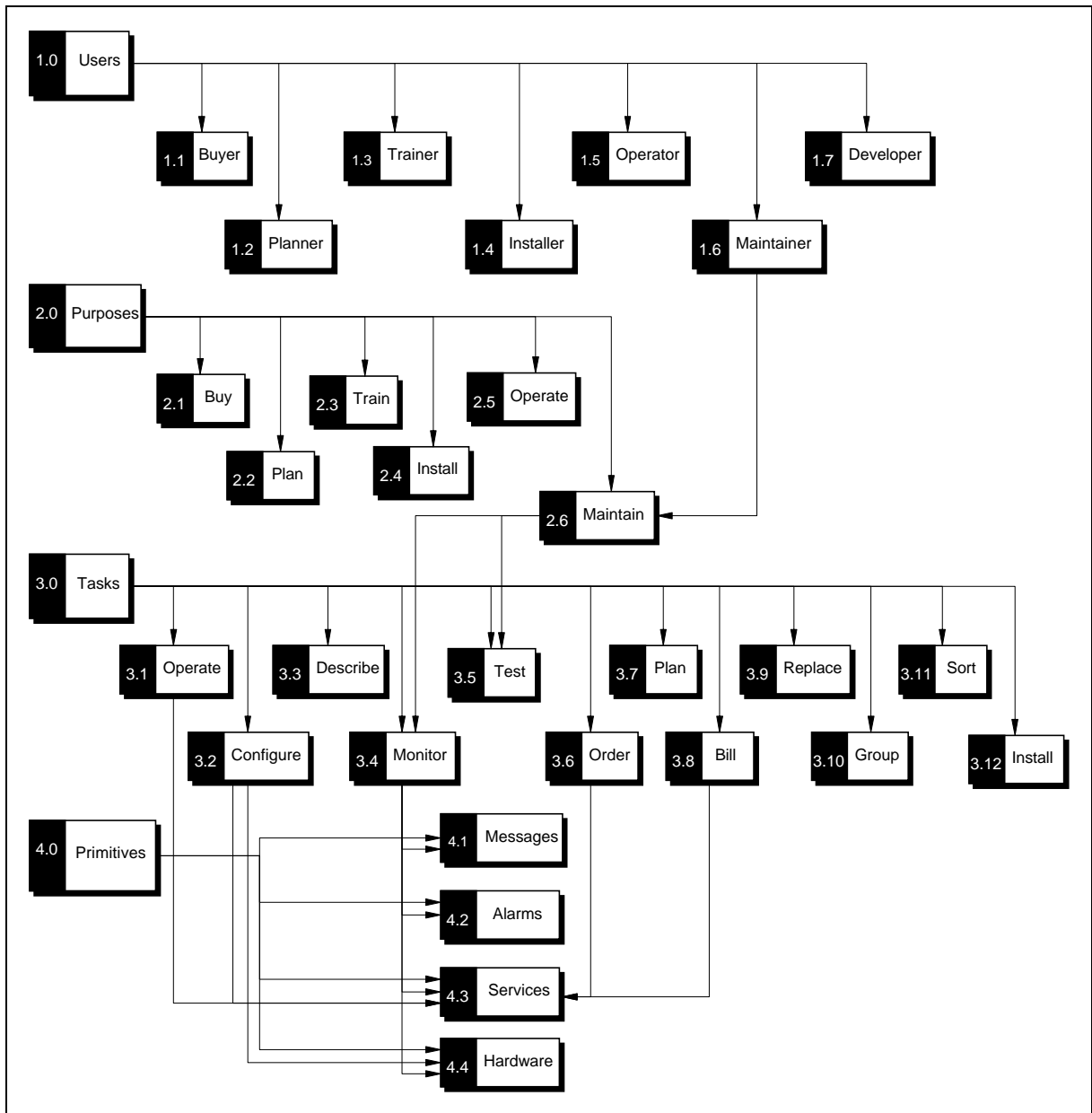
The *users, purposes, tasks, and primitives* information categories are used to tag all information modules, either statically or dynamically, using, say, the extensible markup language (XML). Information is retrieved at the appropriate point during task completion. Information retrieval could, for example, be initiated by a SNMP (simple network management protocol) trap message served from a network device MIB (management information base) and displayed on an XML-compliant browser (for example, *Internet Explorer 5*).

The XML tags are used to define all hierarchical and associative relationships between each user, purpose, task, and primitive category and all information modules. All information is modular with the information categories determining module access. For existing documents, the same information source and document organization could be used for both printed and online media.

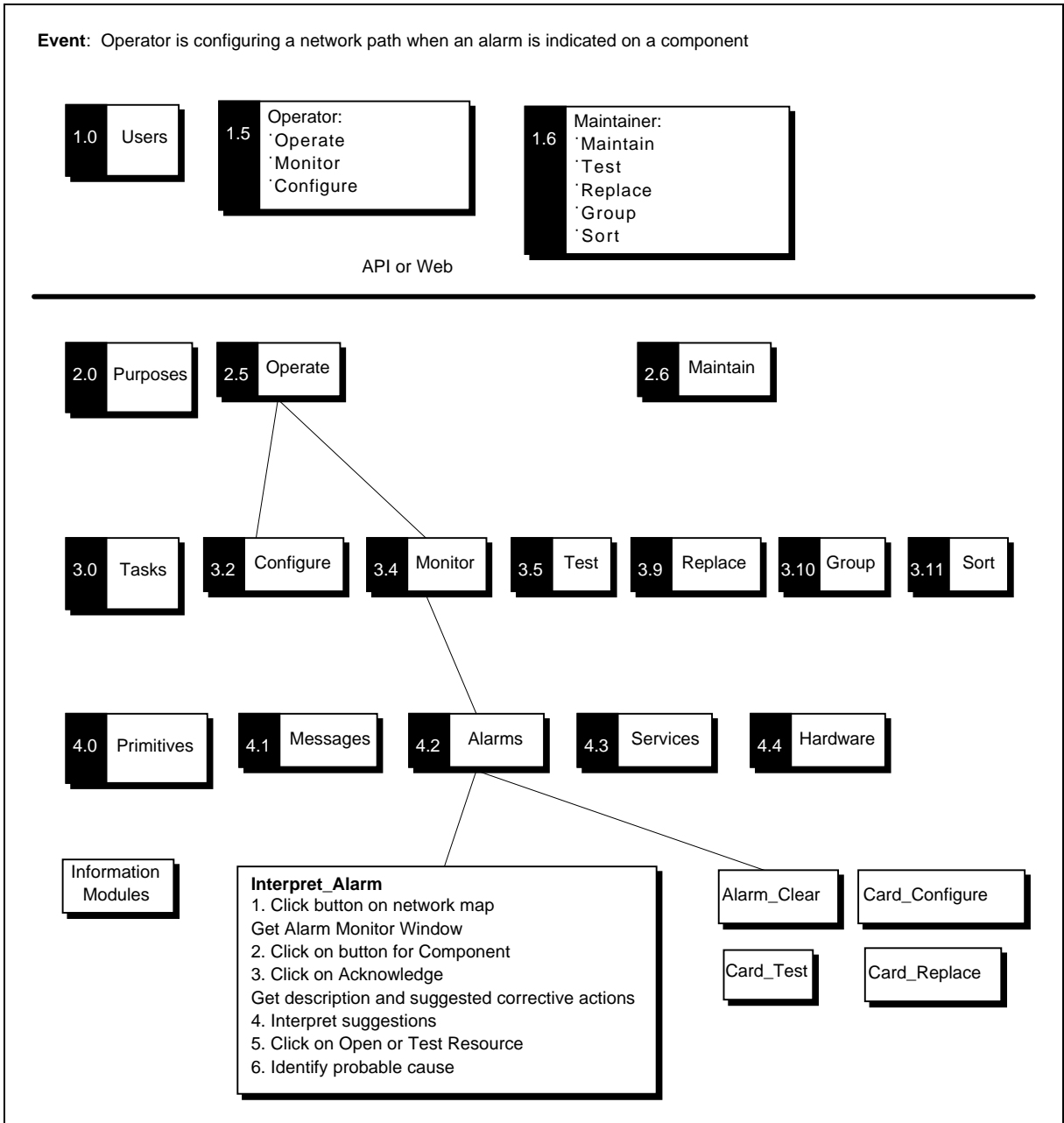
### Information category example

An example of what needs to be done to define the information categories, and to check the viability of the approach, is illustrated in Figures 1, 2 and 3. Figure 1 presents an information mapping of the generic information categories and sub-categories mentioned earlier. Figures 2 and 3 present two examples that show how two different users (an operator and a maintainer) would traverse the information categories to end up using the same information module (*Interpret\_Alarm*).

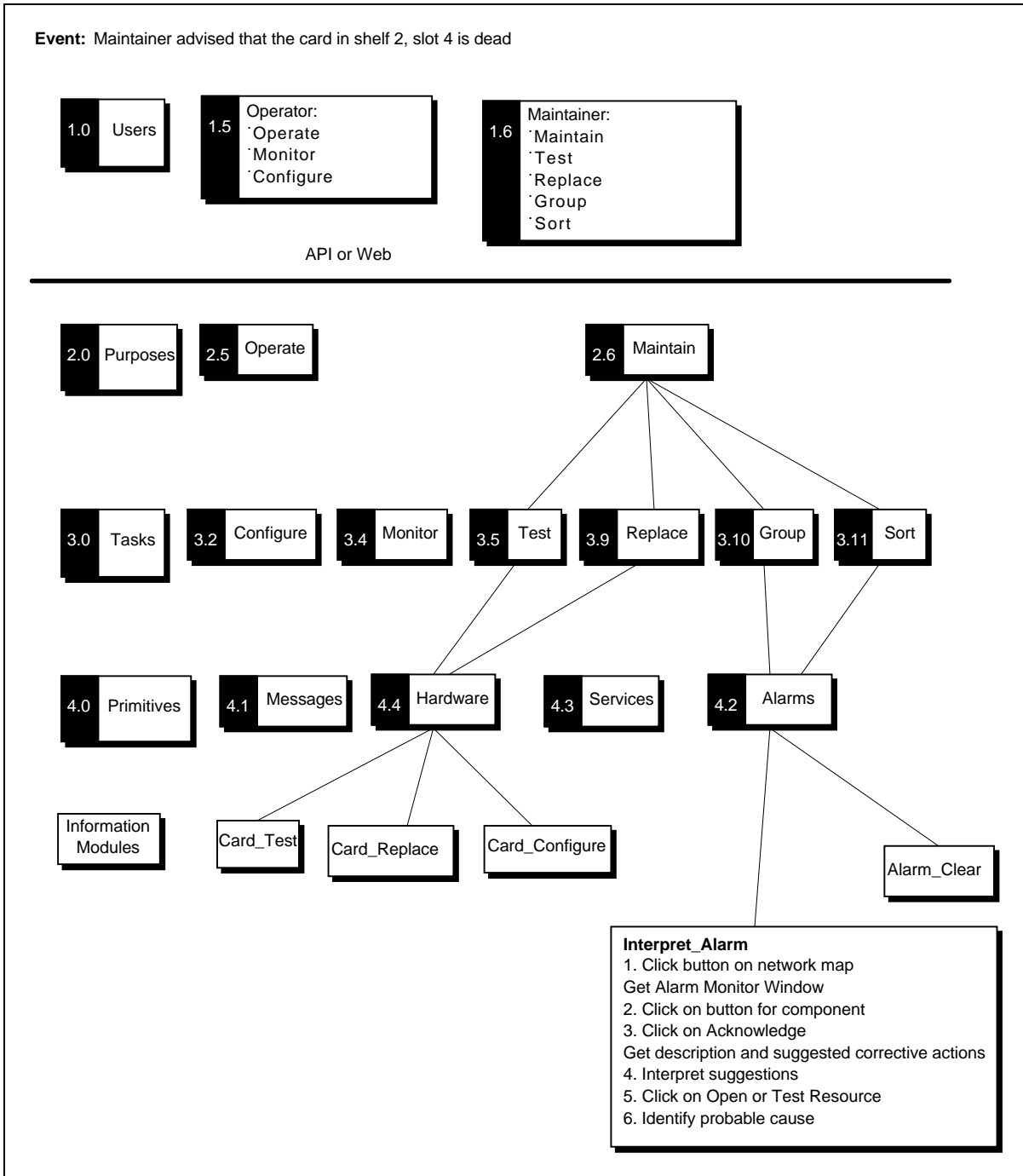
Figure 1. Generic information category model



**Figure 2. Interpreting an alarm example**



**Figure 3. Replacing a card example**



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## Conclusion

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The use of a performance-based model for developing product documentation involves considering user needs from conception to completion. The resulting documentation is more likely to meet actual, as opposed to perceived or guessed, need of users. The model can be implemented in three stages.

1. **Stage A.** Define behavioral objectives for each document chapter and organize information modules accordingly. For IP-based products, identify related SNMP MIB data.
2. **Stage B.** Categorize all objectives using the generic product information categories shown in Figure 1 and assign all information modules to one or more categories; if context sensitivity is required, use XML to tag all information modules; if appropriate, associate with related SNMP MIB data.
3. **Stage C.** Perform usability testing using the behavioral objectives, defined in Stage A, as the evaluation criteria. Use formative usability on each information module during development and summative usability on the completed document.

The model combines existing techniques from the documentation, training, and IP-based product management fields. The model supports multi-authorship since the effectiveness of individual information modules can be tested independently of each other. The model also fully supports Web-based information development and the provision of specific information on a just-as-needed basis to provide users with a truly *compelling web experience*.

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## References

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