3V-01 Information Organizing Method Using Image / Drawing Expression

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1. Introduction

Progressive information technology and a changing economic structure is forming a society in which knowledge dominates the core part of production capacity and requires workers to optimize their productivity. This society should be provided a communication environment with knowledge management where users can share relevant information and knowledge among the information composer and the retriever. The exponential growth of information widely accessible to the modern society has made knowledge management increasingly relying upon the ability to select information relevant to its needs efficiently, and the ability to manage emerging structures of knowledge. In the business world, workers must assemble task and knowledge in response to business cycles and events. This requires them to look for opportunities, select one or more actions, find relevant information or experts, build scenarios and make decisions from the diversity and large number of information available. Therefore there is a need for a tool to organize and retrieve information effectively. An organizing and retrieval interface based on visualization is needed, especially for the information with visual characteristics.

An information organizing and sharing method is proposed as a means of getting the distributed task information available on the Internet or on Intranet in the product design field. In this system, there is an information search tool, selectively gathering relevant words defined by a task terminology dictionary. Meta-data describing the relation between gathered data is created and mutually connected with one another by using the task model defined by the task procedure [1].

Research in the field of information retrieval has produced some techniques where display can be explored more intuitively. One strategy is to shift user's mental load from slower, thought-intensive processes such as reading to faster, perceptual processes such as pattern recognition [2].

This paper proposed an information organizing system that consists of information gathering and refinement, organizing and structuring and retrieval. In addition, we also proposed the use of image or drawing expression of representing task model in the system.

2. System Architecture of an Information Organizing System

In task execution, which includes processes such as a design task, it is important to present workers with structured information along with problem solution for a task goal.

An information organizing system has the following activities:

(1) Information gathering – collection of the information to be managed
(2) Information organizing and structuring;
(3) Information refinement – updating, adding and deleting the information
(4) Information retrieval.

Figure 1 describes the proposed system architecture of an information organizing system. In this system the task model describes the design task procedure where it is based on ontology. Ontology is a shared and common understandings of some domain that can be understood across people and computer.

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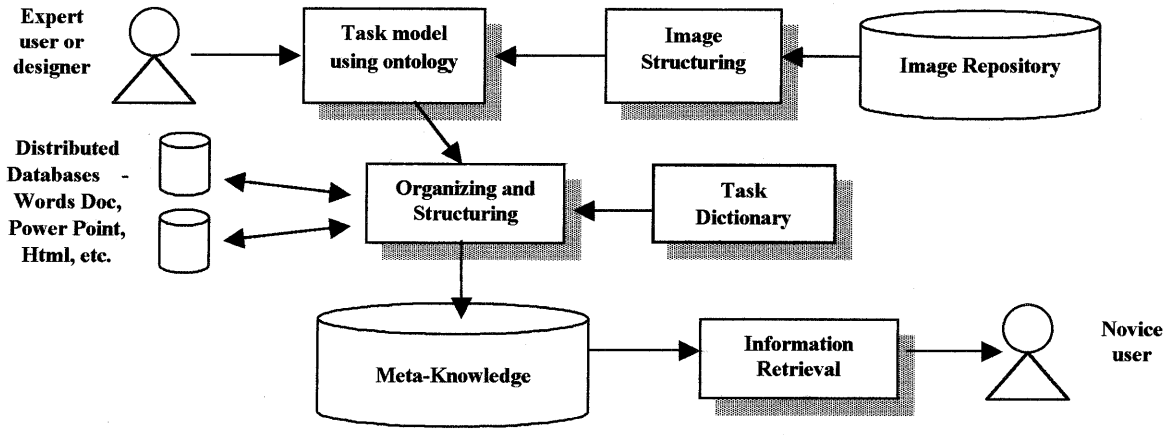

Figure 1: The general system architecture of a proposed information organizing system

The image repository consists of images or drawings where it will be structured to represent tasks. The organizing and structuring tool retrieves the relevant data from the distributed database. By using the task dictionary, which consists of rules and relationship of the task model, it generates meta-knowledge.

3. Interface of the Information Organizing System.

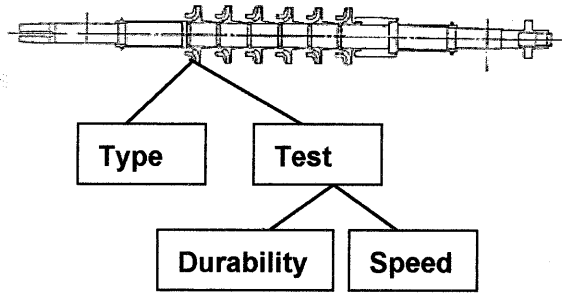

Figure 2: An impeller design task model.

Figure 2 shows an example of how an image can be used to represent a task model. Each part of the impeller has its own characteristics and task. Human eyes will be able to identify the parts but not computers. Therefore we proposed to represent each part of an image with task, similar to the click-able map technique. For example the impeller can have a type and also some test done on it and it can be expressed in the form of a tree or table. An expert user or designer can edit, delete or add a new task.

4.Future Plan

The following are the future plan of this research:

(1) A tool to structure the image and associates it with its task.
(2) Using Extended Markup Language (XML) as a tool for ontology.
(3) An appropriate visual interface for information retrieval.

5. Conclusion

In this paper we discuss the use of pictures to represent a task model in an information organizing system.

Images are used because users can mentally identify an object far quicker than the process of reading. It also gives a better understanding of what the task model represents.

References

[1] H. Kojima, et.al, "Information Organizing and Sharing Method in Business Media Service for Virtual Manufacturing Enterprise", *IEEE SMC'98 Conf. Proceedings*, pp.305-312 (1998)

[2] Marti A. Hearst. "Interfaces for Searching the Web," Special Report Article in Scientific American #3 1997. Available from http://www.sciam.com/0397issue/0397hearst.html [2000, July 14]