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John Wells
Texas A and M University

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User Oriented Interface Metaphors: A Comparative Analysis

John D. Wells
Texas A&M University

Research Question

The interface metaphor is not a new concept. Although metaphors are used extensively in user interface design, there is an increasing need to identify and develop more effective metaphors. Information technology is being utilized by a wide variety of users in a number of different domains. A large number of these user domains do not fit well with a traditional metaphorical interface (e.g., desktop). Because metaphors are defined by a user's perception of objects in his/her environment (Lakoff and Johnson, 1980), these varying domains will act as a catalyst when deriving potential interface metaphors. The research in this paper will address several important issues. How effective is a metaphorical interface that utilizes objects derived from the user domain? Does it improve user productivity, accuracy, and satisfaction? Are these interfaces more effective when presented to novice users? How do experienced or expert users respond to them?

Important Literature

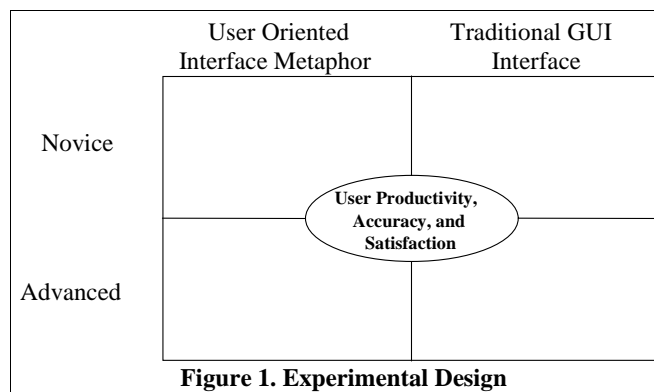
Metaphors are human derived models that apply tangible, concrete, recognizable objects (source domain) to abstract concepts and/or processes (target domain). Lackoff and Johnson (1980) state that "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" (p. 5). While Lackoff and Johnson see merit in the use of metaphors as a tool for understanding abstract concepts, others feel that metaphors are just another form of literal language (Davidson, 1979), thus implying a limited value.

The role of metaphor in the design of information systems has been approached from a number of different perspectives. It has been viewed philosophically (Coyne, 1995; Turkle, 1995) as well as pragmatically (Johnson, 1994; Madsen, 1994; Raskin, 1997). It has been examined at the individual level (Ericksen, 1990; Kay, 1990) and also at the organizational level (Kendell and Kendell, 1993). Ericksen (1990) and Madsen (1994) discuss some of the key issues and steps that should be included in a methodology that focuses on metaphorical interfaces.

There has been extensive research in the area of metaphorical interfaces and their effect on learning and usability (Carroll and Thomas, 1982; Carroll and Mack, 1985). Erickson (1990) discussed methods for evaluating interface metaphors while Kay (1990) presented some of their limitations.

Methodologies

Two front-end interfaces will be designed for the same back-end database. The design principles presented by Erickson (1990) and Madsen (1994) will be referenced to create a metaphorical interface that incorporates objects and processes that are appropriate for that particular user domain. The other interface will be designed using established GUI design principles that are commonly used in industry (Weinschenk and Yeo, 1995). The proposed experimental design will consist of a 2X2 factorial (see Figure 1).



Potential Data Analysis and Expected Benefits

If multiple dependent variables (e.g., productivity) are measured, then a type of multiple comparison procedure (e.g., multivariate) will be employed. This depends on the whether or not correlation patterns will be examined. The major benefit from this study is empirical evidence as to the effectiveness of user oriented metaphors. One will be able to see how user experience (expert vs. novice) affects the effectiveness of this type of metaphor. Finally, a well-defined methodology can be derived that will provide more focus for the development of metaphorical interfaces.

References

References available upon request from author (jdwells@tamu.edu).