Human Factors Experiment Upon Learning SQL: An Evaluation of the Roles of Conceptual Model and Computer Interface

Minnie Yen
University of Alaska, Anchorage

Follow this and additional works at: http://aisel.aisnet.org/icis1994

Recommended Citation
http://aisel.aisnet.org/icis1994/29

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 1994 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
HUMAN FACTORS EXPERIMENT UPON LEARNING SQL: AN EVALUATION OF THE ROLES OF CONCEPTUAL MODEL AND COMPUTER INTERFACE

Minnie Yi-Miin Yen
Department of Computer Information and Office Systems
University of Alaska, Anchorage

ABSTRACT

Since SQL has been accepted as an ANSI standard, how to help SQL users to learn and use the language becomes an important issue for both vendors and training providers. At the same time, with the growing concern for making DBMS easier to learn and use, the vendors have also used tabular interfaces in their product, such as QBE-like language. Tabular interfaces use two dimensional table-like qualities of relational systems as an aid in query writing. This trend has led to an interesting research question: "When user training is conducted, will this tabular-like interface help users to learn and use SQL?" Assimilation Theory suggests that meaningful learning can occur only if all three conditions, Reception, Availability and Assimilation, are met (Davis and Bostrom 1993). This theory provides a basis for understanding why a given type of interface may be more effective than another in training. It also suggests that in order to achieve meaningful learning, the cues must be provided to help learners to retrieve appropriate existing concepts.

In an end-user computing environment, it is important that a designer or trainer of the DBMS query language can formulate an appropriate conceptual model (appropriate in the sense of being accurate, consistent, and complete) to ensure that individuals learn to use the language effectively. Each operation of SQL takes either one or more relations (tables) as its operand(s) and produces a new relation (table) as its result. Reisner (1971) developed a syntactic model of query writing from English questions. This model characterizes a query as consisting of a syntactic form, or template, together with the lexical items inserted into it. Both the template and the lexical items are created by a human process which transforms an English sentence into the relevant query components. To be able to identify characteristics that are important for conceptual models provided in a query language manual with different interfaces upon learning and using SQL in a query writing task, the present experiment attempts to test two hypotheses: (1) Will a table model better prepare users to deal with problems that may occur in query writing than a syntactic model? (2) Will it help users learn the language when a given model is consistent with the form of interface?

This research adopted a framework based on Bostrom's end-user training model (Bostrom, Olfman and Sein 1990) but focusing only on the influences of the target system and training approaches on training outcomes. It defines the target system based on two interface types and training approaches based on two conceptual models. A laboratory experiment was conducted to analyze the effect of two types of interfaces (a command based interface with traditional linear syntax and a table-like interface) and two conceptual models through training (syntactic model and table model). User performance was measured through hands-on use of a relational DBMS.

The preliminary results of this research suggest that using different conceptual models may not lead to a difference in user performance, but using conceptual models in conjunction with the consistent form of interface can lead to a difference in user performance. The table manipulation description with support of tabular interface yields user learning and using SQL.

REFERENCES
