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"An Investigation of Abstraction in Events-Based Accounting Systems"

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Abstract

The computer science and cognitive psychology literatures have long applauded the ability of abstraction -- the suppression of detail irrelevant for a given decision -- to control complexity. This concept has been subject to little, if any, empirical testing; instead it is taken as conventional wisdom. This dissertation began as an attempt to demonstrate that this conventional wisdom would hold true in an accounting setting. Events-based accounting systems, in spite of the many benefits they offer, have been criticized because people believe they will cause information overload. This dissertation hypothesized that use of an abstraction hierarchy (which decomposes a model into multiple views at varying levels of detail) as an interface to an events-based accounting database would mitigate information overload and thereby enhance user performance. The abstraction hierarchy tested is based on the REA accounting model applications of abstraction proposed by McCarthy (1982, 1987) and further developed by Gal and McCarthy (1992).

Subjects used computerized interfaces (with either no abstraction or an abstraction hierarchy) to generate financial statements using an REA accounting database. Subjects' accuracy, speed, and perceived manageability were measured, while controlling for accounting and data modeling knowledge. Contrary to expectation, users with the abstraction hierarchy did not perform any better than those without any abstraction in their interface. This reveals that abstraction is not always useful for controlling complexity and demands that this construct be subject to further empirical tests.

Several important contributions are made by this dissertation. First, it is the first study using the REA accounting model that both builds an instantiation of the model and empirically tests the instantiation. Second, it reveals results which are counter to an axiomatic concept in computer science and discusses why those results are probably not a fluke. Third, the study expands on typical database studies by using a task which is sufficiently difficult to yield results that are more generalizable to "real" decision-making.