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Multivariate decision accuracy and the presentation of accounting information

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Abstract

Since multivariate graphics provide spatial integration, summarization and comparison of information, they may provide the means for improving decision-making. This study tests for the incremental benefit of multivariate graphics over a tabular format, by comparing the outcomes for tabular–graphical combination formats with tabular-only formats in an experimental environment. This is an area where research has been sparse and where existing results are inconsistent.

The study examines the interactive influence of presentation format and information complexity on multivariate decision accuracy, to determine the most effective presentation format for the performance of multivariate decision tasks of varying complexity. Results show a significant interaction between presentation format and information complexity to affect multivariate decision accuracy. When information complexity is low, presentation format has no impact on accuracy. However, when information complexity is high, the tabular-alone format shows the highest accuracy. The advantages of graphical and pictorial formats reported in earlier studies are not supported, a finding which has significant implications for the manner of disclosure of financial statements through graphical means.

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1. Introduction

The identification of potential business failure is important to many corporate managers, investors, bankers and auditors. If the warning signs exhibited ahead of failure can be identified in advance, then appropriate action can be undertaken hopefully to reverse the process or at least to minimise the possible damage. One potential way to improve such judgements is to improve the information presentation format (Davis, 1989; Kleinmuntz & Schkade, 1990; Libby, 1981; Maines, 1995).

Bankruptcy prediction is typically a multivariate decision requiring the consideration of multiple financial variables over multiple time periods. Since multivariate graphics provide spatial integration, summarization and comparison of financial variables, they may result in better decisions (Gibson & Schroeder, 1990).

The traditional and more familiar tabular presentation of data is typically available to decision makers, though they can usually refer to specific data values before making a final decision. The potential for improved decision making exists if additional information can be gleaned from the presentation of data in alternative formats.

Given that tabular presentations are familiar, useful and normally available, this study tests for the incremental benefit of multivariate graphics over tabular formats (i.e., by comparing tabular-graphical combination formats with a tabular-alone format), an area where research efforts have been sparse (excepting Benbasat & Dexter, 1986; DeSanctis & Jarvenpaa, 1989; Nibbelin, Bailey, & Zmud, 1992; Wright, 1995). Even then results have been inconsistent (as detailed below).

In addition to the more traditional multivariate graphic presentations of bar charts, this study includes the more innovative form of schematic faces developed by Chernoff (1973). By assigning variables and their values to facial features, changes in expression, can provide a quick indication of the relationship among variables. A single global judgement is promptly facilitated despite the novelty of the approach.

Because task characteristics (essentially task type and task complexity) have been shown to be important in decision performance across different presentation formats (see reviews and meta-analyses: DeSanctis, 1984; Hwang & Wu, 1990; Jarvenpaa & Dickson, 1988; Montazemi & Wang, 1988–1989; and other works: Amer, 1991; Blocher, Moffie, & Zmud, 1986; Hard & Vanecek, 1991; Umanath & Vessey, 1994; Wright, 1995) report format and task characteristics must be considered in an interactive manner in examining decision performance across different formats.

The issue of task characteristics is, however, quite complex, given the variety of definition, interpretation and measurement, and the absence of a ready taxonomy of classification. Task characteristics have many dimensions, among them, those more commonly reported in the literature: task type and task complexity (DeSanctis, 1984; Libby & Lewis, 1982). Task complexity can be further distinguished into information complexity and job complexity (Liang, 1986). Such a distinction, however, is rarely made in the literature, further complicating this issue because of alternative ways of measuring information complexity and job complexity.

The current study focuses on the multivariate decision task and on information complexity, because information complexity is more fundamental than job complexity and can be objectively assessed, independent of any particular task-doer, and unaffected by the

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