Software Use Through
Monadic and Dyadic Procedure:
User-Friendly or Not-So-Friendly?

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ABSTRACT

Our research objectives are to provide a theoretical discussion on how software
may impact user performance in ways contrary to designers’ intentions and users’
desires, and to empirically evaluate user performance impacts that derive from
ostensibly performance-enhancing software features. We propose that dyadic
procedure is associated with higher levels of user performance when compared to
monadic procedure. Using word-processing software utilization as the research
context, we test the proposition on data from 46 participants. Contrary to
expectations, the results suggest that dyadic procedure may decrease the accuracy
of users’ work. We conclude that software design features that are intended to
improve user performance may have opposite effects, which raise questions about
these features’ utility and desirability.

Keywords: end-users; software design; system restrictiveness; user behavior; Word
processing applications

INTRODUCTION

Users’ access to and utilization of computers have become widespread due
in part to developments surrounding graphical user interfaces, multifaceted
packaged software, the Internet, and electronic commerce. However, there are
indications that suboptimal utilization persists (Brynjolfsson, 1996; Marcolin,
Compeau, Munro, & Huff, 2000), which challenges a frequent assumption that un-
qualified utilization is positively related to performance (Thompson, Higgins, &
Howell, 1994). Thus, it may be that users do not know how to carry out effective
and efficient computer use, which may potentially have adverse consequences for
individual and firm-level performance.

Partly in response to this situation and partly due to competitive necessity, soft-
ware vendors have continually improved their products to increase ease of use and
to enhance user performance outcomes.
Despite these advances, we contend that software innovations do not uniformly produce favorable performance impacts. Moreover, we argue that a critical examination of software innovations’ impact on user performance is needed for two related reasons. First, the various ways that users apply an innovative feature do not always coincide with developers’ intentions, therefore the effects of any feature cannot be fully predicted. Second, while a software designer may intend that an innovative feature enhance user performance, the feature may actually bring about reduced performance.

**Research Objective**

Our research objectives are to provide a theoretical discussion on how software may impact user performance in ways contrary to designers’ intentions and users’ desires, and to empirically evaluate user performance impacts that derive from ostensibly performance-enhancing software features.

**Research Scope**

Our characterization of computer use relates to software that end users typically utilize in the workplace. End users include workers whose formal role designation lies outside the IS area (McLean, Kappelman, & Thompson, 1993) and who commonly use software referred to as productivity software. Productivity software includes Microsoft Office, Corel WordPerfect Office, Lotus SmartSuite, and the like.

A focus on this type of software is particularly relevant because it is pervasive in the workplace. Among U.S. workers who use computers, about 63 million employees or about one half of the U.S. workforce as of October 1997, 57% use word- or document-processing programs, 41% use spreadsheet or analysis programs, and 26% use desktop publishing or graphic programs (U.S. Census Bureau, 1998-2001). Moreover, it is estimated that there are approximately 300 million Microsoft Office users worldwide (“WordPerfect,” 2002). Within the productivity-software market segment, Microsoft’s increasingly dominant share is exemplified by cessation of market-share tracking efforts since 2000 (“Microsoft,” 2002).

**THEORETICAL PERSPECTIVE**

In his seminal work on decision-support systems (DSSs), Silver (1990) identified two conceptually distinct ways that computer-based DSSs may change decision-making processes — nondirected and directed. The nondirected view specifies that any direction of change in decision-making processes is determined solely by the decision maker and is, therefore, relatively independent of the computer-based DSS. In contrast, the directed view specifies that a DSS will force a direction of change in the decision-making process that may or may not be consistent with the decision maker’s preferences. Under this view, while not entirely subjugated to the computer-based DSS, the human decision maker’s discretion over
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