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Perceived Usability of ERP Training Manuals

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ABSTRACT

Training users is a critical success factor in ERP implementations. An important aspect of training is documentation in the form of training manuals. However, the effectiveness of the training manuals will depend on their perceived usability. In this study, survey items for usability, modeled after the Questionnaire for Usability Evaluation designed by U.S. WEST Information Technologies, assess task support, learnability, navigation, and presentation. This study also investigates the relationship of perceived usability with perceived ease of use and perceived usefulness of the manuals as well as the user's computer self-efficacy. Data from a survey of over four hundred users of ERP at a large university are used to analyze several related hypotheses. This research extends the Technology Acceptance Model to usability of training materials in an ERP domain. It has implications for practitioners on the design of ERP training materials.

Keywords

usability, ERP, training, TAM.

INTRODUCTION

Implementing Enterprise Resource Planning (ERP) systems is high risk (Scott and Vessey 2002). Nevertheless, organizations recognize ERP's potential to efficiently support most of their business processes. Recently, research identified training users as a critical success factor in ERP implementations (Somers and Nelson 2001).

Training revenues for ERP vendors were anticipated to be \$2.8 billion in 2003 (Wheatley 2000). In spite of the money firms spend on ERP training, it is a consistently under budgeted item (Slater 1998). Actual costs of training can be as high as 30% of an ERP budget, but often are as low as 5%.

ERP systems attempt to codify a set of business processes, yet frequently ERP training focuses on only software specific training, rather than the business processes that underlie that software (Neiderman and Webster 1998). At an ERP user seminar, 75% of respondents reported that next time they would allow more time for training, and would tailor it more around their own business processes (Wheatly 2000). The lack of tailoring combined with short and often last minute time frames compromises training.

"Learning the software is the easy part. For people involved, relearning their jobs is the real challenge. You're not only talking about the hard skills of the system itself, but the soft skills of running the business... Training and education is about working on all of those [business changes] on a continuing basis" (Schaff 1999 page ET5).

A non-trivial aspect of ERP training is the manual, which ideally documents organizational specific processes to support users' tasks. The objective of this research is to assess process support and the impact of users' computer self-efficacy, perceived ease of use and perceived usefulness of ERP training manuals on the perceived usability of the manuals. This study could lead to improvements in the design of ERP training materials and the effectiveness of ERP training.

THE ASP PROJECT

The Administrative Streamlining (ASP) Project at the University of Colorado sought to solve three major problem with a new ERP system: (1) minimize the amount of administrative effort and expenditures; (2) replace technologically inferior,

inflexible administrative information systems; and (3) increase the availability of management information to personnel responsible for managing the human resources (HR) and finances of the university.

The ASP project initially proposed to spend \$32.7 million on the ERP system, of which approximately \$2 million was allocated to training costs (University of Colorado 1998). PeopleSoft modules for Finance and HR were implemented in February of 1999, and in April of 2000 respectively. Each module had its own training class and its own manual. Training is mandatory before new users are allowed onto the system. When the modules were first introduced, training was ongoing and intensive for all university staff involved in HR and Finance functions. Since implementation, training for new users is offered approximately twice a month. The training is classroom-based and is available on each of the four campuses of the CU system. Two of the campuses have dedicated training labs with updated computers and a live practice database available to users. Users receive a manual, which they can annotate, in the classroom training session.

CONCEPTUAL MODEL

With a few exceptions, the research streams on the technology acceptance model (TAM) (Davis 1989) and usability are distinct. Yet both streams of research have been applied to computer training and they seem to have some overlapping constructs. A unified model, which uses both TAM and usability measures, should clarify the relationship between usability and acceptability (Dillon and Morris 2001). In this study we are investigating whether perceptual measures used in TAM studies predict perceived usability (See Figure 1). The overall hypothesis, (which decomposes into H1, H2 and H3), follows:

Perceived usability of training manuals depends on computer self-efficacy, perceived ease of use of IT, and perceived usefulness of training manuals.

Two other hypotheses are associated with TAM relationships. The 5 hypotheses and relationships among the constructs in Figure 1 are explained below.

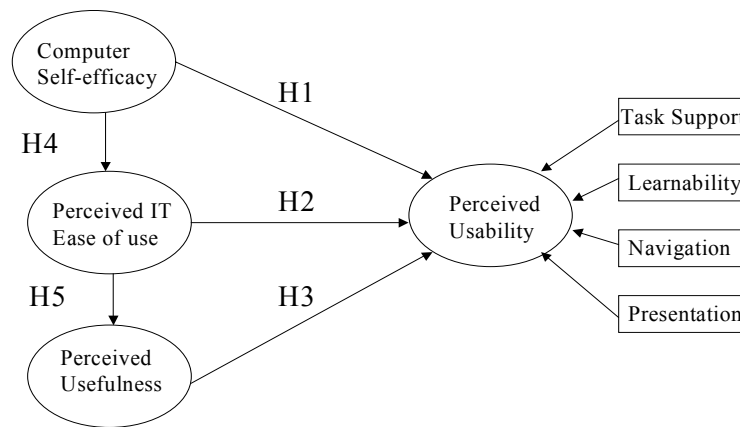


Figure 1. Perceived Usability Model

Perceived usability

A computer application can have adequate functionality, be reliable, maintainable, and meet technical requirements, and yet not be usable. Early pioneers in the usability field pointed to the fundamental principles of good design, such as having a good conceptual model before designing a product. Usability in simple terms is making sure that something works well, and that a person of average ability can use it for its intended purpose without frustration (Krug 2000).

Usability was later applied not only to the design of everyday products, but also to computer interfaces and training manuals. The International Standards Organization (ISO) defines usability as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use” (ISO 1999).

Effectiveness measures the “goodness” of the output by the user or whether users can perform their tasks, whereas efficiency has more to do with the quantity of work output in relation to the time, effort and resources involved (Dillon and Morris 2001). The satisfaction of a user is a measure of the users attitudes and perceptions about the usability of an item. Products with good usability allow users to complete their tasks well in a timely manner with a minimum of frustration.

Prior research has used a practitioner instrument to assess usability (Agarwal and Venkatesh 2002). Similarly, in this study, the items assessing usability were adapted from the Questionnaire for Usability Evaluation (QUE), designed by US WEST Information Technologies (1996) to assess the usability of interfaces. The dimensions of usability assessed using QUE are task support, learnability, navigation, and presentation. Task support refers to the capability to help users perform their tasks quickly, effectively, and economically. In QUE, learnability is how easy a system is to learn so that users can quickly begin to get their work done. In this study, learnability is applied to how helpful the manuals were to new users in learning the ERP system. Navigation refers to the methods by which users move around in a system. In the training manuals, ideally it would be easy for users to find information using the table of contents and index. Lastly, presentation uses good graphic design principles for fonts, colors, layout, and white space, while making sure not to distract users from their primary task. Task support, learnability, navigation, and presentation dimensions contribute to users’ effectiveness, efficiency and satisfaction. While the terminology varies, QUE dimensions are analogous to those proposed by usability experts and researchers (Agarwal and Venkatesh 2002, Krug 2000, Nielsen 1993).

Computer self-efficacy

Although characteristics of the software, task and organization also influence effectiveness of the software learning process, most research has focused on the learner (Compeau, Olfman, Sei and Webster 1995), and in particular the learner’s computer self-efficacy (CSE) (Compeau and Higgins 1995, Marakas, Yi, and Johnson 1998, Christoph, Schoenfeld and Tansky 1998). CSE is defined as "an individual judgment of one's ability to use a computer" (Marakas et al. 1998). CSE is based on Bandura’s (1986) pioneering research, which revealed that individuals with high self-efficacy were highly motivated to be persistent in their achievement of a goal, and not easily discouraged by failure.

CSE depends on computer experience, which also has a strong positive effect on perceived ease of use and perceived usefulness (Igbaria and Iivari 1995). Users who are more experienced using computers become more confident in their abilities to achieve their tasks, and hence develop higher CSE. In addition, as they become more experienced, they will likely find computers easier to use, and more useful than a novice user might. In the context of training, Christoph et al. (1998) found that CSE was a significant factor in computer-based multimedia training effectiveness. Furthermore, research on the TAM has shown that CSE affects perceived IT ease of use (Venkatesh 2000) (H4). Our model hypothesizes that users with higher computer self-efficacy would find training materials easier to follow and understand, and hence more usable.

Perceived ease of use

Perceived ease of use (PEOU) is the extent to which a person believes that using a technology will be free of effort (Venkatesh 2000). PEOU is important for determining perceived usefulness, (H5) acceptance and use of technology and is influenced by CSE (H4) and other characteristics of the user. Over time, experience with the system will affect the user’s PEOU. Our model hypothesizes that users with higher PEOU of IT would find training materials easier to follow and understand, and hence more usable.

Perceived usefulness

Training manuals have evolved from early software-oriented manuals, which, although they provide a reference to all the commands in the system, are not useful in helping people get things done (Rettig 1991). The next step in the evolution, task-oriented manuals, are more explicit since all the steps to complete a task are specified. While perceived as useful by some, others believe it may lead to deskilling and a decrease in discretion (Brockmann 1990). In response to research on the poor fit between task-oriented manuals and how adults learn, the minimalist manual was created (Carroll et al. 1987). Whereas it helps people start up better, reduces their errors and coordinates their attention, the minimalist design assumes a motivated user who may choose ineffective or unattainable goals and find that learning by self-discovery is unsatisfactory (Brockmann 1990). Nevertheless, Business Application training should go beyond step-by-step instructions for a task by explaining the logic in the software functionality (Huang 2002)

In this study, we investigated the perceived usefulness of ERP training manuals for helping users understand the business processes at CU. In ERP training, understanding the logic of the business processes is important for helping users adapt to changes in their tasks. Consequently, we hypothesize that perceived usefulness contributes to perceived usability, especially the task support dimension.

RESEARCH METHODOLOGY

A Web-based survey was designed to investigate the usability model in Figure 1. One of the authors met with the Director of the Office of Change Management Services at CU to collaborate on the survey, and also participated in a half-day intensive hands-on HR training session, which provided valuable insight for the design and administration of the survey. The survey uses adapted TAM measures validated in prior research and adapted questions from QUE. It includes a question on “the manual helping users to understand business processes”. Users were notified to participate in the survey via an e-mail alert, and a follow-up e-mail alert reminded users a few weeks later. Over 400 responses were received. We will test for bias based on users’ CSE by comparing early and late responses. Data analysis using partial least squares and regression will determine the reliability and validity of the measures as well as statistical significance of the hypotheses represented by the relationships in the model. We expect that the results will show that the manuals need more emphasis on business processes. Our findings will have implications for improving the design of ERP manuals, which would decrease the pain and cost of ERP implementation.

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