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# EXPLORING ERP SUCCESS FROM AN END-USER PERSPECTIVE

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## Abstract

*The objective of this study is to evaluate the applicability and effectiveness of the End-User Computing Satisfaction (EUCS) measure by Doll and Torkzadeh (1988) and to assess the role of user training and knowledge for ERP system success. The significance of this work to the research community is that it represents a first effort to empirically assess the concept of user satisfaction in ERP success and determine if the EUCS instrument can be used in conjunction with ERP systems.*

**Keywords:** End-User computing satisfaction, enterprise resource planning, user satisfaction, ERP system success

## Introduction

The implementation of ERP systems is a complex issue involving an intricate set of tasks from system design and selection to installation, fine-tuning, maintenance and upgrades. From a technical perspective, ERP systems represent very complex pieces of software that require large investments of money, time, and expertise (Davenport 1998). Despite the huge investments, the results of ERP implementations are mixed at best. Many ERP installations achieve only partial implementation and nearly one in five are scrapped as total failures (Trunick 1999). Lack of user training and failure to completely understand how enterprise applications change business processes frequently appear to be responsible for problem ERP implementations and failures (Crowley 1999). This is consistent with prior research that found only 10% of new information systems failures could be attributed to technological problems (Bikson and Gutek 1984). Instead, the human element has become the critical determinant of IS success (Martinsons and Chong 1999), and user satisfaction or user information satisfaction is considered the most widely used single measure of I/S success (DeLone and McLean 1992).

## End Users and ERP Implementations

We believe that users play a pivotal role in achieving ERP success. ERP systems introduce large-scale change and appear to have a six-month learning curve at the beginning of the project (Cooke and Peterson 1998). At a minimum everyone who uses ERP systems needs to be trained on how they work and how they relate to the business process, and successful training should account for up to 15 to 20 percent of the implementation budget (Marion 1998; Slater 1998). Total training can take between six months to over a year including analysis of staff skills, design based on skills gap analysis, and actual delivery of education (*ERP Hub*, April/May 1999). Computer-based training via intranets has been found to facilitate implementations (Marion 1998; Mahapatra and Lai 1998). Although many companies use consultants to help during the implementation process, it is important that knowledge is transferred from the consultant to internal employees (Davenport 1998).

## Measuring ERP Success

We interpret ERP success from the end user's perspective and seek to explore the applicability of the end user computing satisfaction concept to ERP. Ives, Olson, and Baroudi (1983) defined user information satisfaction as "the extent to which users

believe the information system available to them meets their information requirements.”(p. 785) while Doll and Torkzadeh (1988) conceptualized user satisfaction as “the affective attitude toward a specific computer application by someone who interacts with the application directly”(p.261). A widely used, robust instrument considered to be the standard in reliably and validly measuring end-user satisfaction with a specific application is the End-User Computing Satisfaction (EUCS) instrument by Doll and Torkzadeh (1988). The 12-item instrument consists of five subscales measuring content, format, accuracy, ease of use, and timeliness (see Table 1). Previous studies have applied the instrument to a variety of IS applications including voice mail and email applications (Adams, Nelson and Todd 1992), applications on either a mainframe or PC/desktop application at a large public organization (Hendrickson, Glorfeld and Cronan 1994), and computer simulation models (McHaney and Cronan 1998). Part of the instrument was also used to assess the quality of user-developed applications in a study of determinants of information center success (Essex, Magal, and Masteller 1998). While the software used represented a major point of control in the Doll, et al. (1988-1994) and Adams, et al. (1992) studies, the DSS software in the McHaney, et al. (1988) research was likely different, albeit of the same genre, in every case. An important aspect of information system success not addressed by the EUCS instrument is the component of user training and knowledge of the application system, which was included in a study of computer user satisfaction by Bailey and Pearson (1983).

To date, the EUCS instrument has not been tested with users of ERP systems. ERP systems were designed to solve the problem of fragmentation of information in large organizations by consolidating all business operations into a uniform system environment to improve delivery of critical information to users and improve data consistency. Given these goals, the attributes measured by the EUCS instrument shown in Table 1 appear to be of interest in the context of ERP systems as well. The present study thus seeks to determine if end-user computing satisfaction is a valid concept in conjunction with ERP systems. We seek to replicate previous studies and explore (1) if the hypothesized psychometric properties of this instrument hold (Doll & Torkzadeh 1988; Doll, Xia and Torkzadeh 1994), and (2) if the use of the EUCS instrument can be extended to the measurement of enterprise system success. Similar to the McHaney and Cronan (1998) study, users in our study may not only work with different ERP applications from the same vendor but may also use software from different vendors. Furthermore, we seek to analyze the role of training in ERP success and extend the EUCS instrument to include further items pertaining to ease of use and relative advantage of the ERP application.

## Research Methodology

Data used in this study was collected via a nationwide mail survey of end users of ERP systems. The random sample of a wide range of companies that had ERP systems installed was drawn from the Spring 2000 edition of the *Directory of Top Computer Executives*. Introductory letters along with questionnaires were sent to the CIO, or other top level executive, at 1162 firms asking them to transmit the questionnaires to 3 end-users of various modules of their ERP system and encourage them to participate. Following Simon and Burstein (1985) we used this type of snowball sampling because a wide range of users could not easily be located by random sampling but key individuals who knew end users of interest to our study could. As part of a comprehensive study of ERP training and end user satisfaction, we asked respondents to provide us with background information such as level of education, current job title, length of time of using ERP system, the type of ERP system they were using, and activities for which they were using the system. We also included the EUCS measure (Doll and Torkzadeh 1988), asking respondents to describe their level of satisfaction with the ERP application they were using on a 5 point Likert scale for the items shown in Table 1. ERP training was addressed with nine items concerning the amount of training, knowledge received, topics covered in training, and degree of ease with learning the system. We also asked respondents to indicate their overall level of satisfaction with the organization’s ERP system. In a first step, we have begun to assess the psychometric stability of the EUCS instrument to determine if the hypothesized factor structure maintains its reliability and validity properties when used to measure ERP system success. Simple statistics for the individual items, factor loadings, and Cronbach’s alpha for the subscales are shown in Table 1.

## Conclusion

ERP success is an elusive concept. We believe that the EUCS measure (Doll and Torkzadeh 1988) that has been applied to a variety of contexts may also be useful to assess ERP system success. If construct validity, internal validity, and reliability can be established, use of the instrument can be extended to the measurement of ERP system success. We further believe that training is crucial to ERP success. The expected contribution of our study is twofold. For one, focusing on a different, and recently widely implemented software genre (ERP) represents a new approach in user satisfaction model development. Secondly, most of our knowledge about users of ERP systems is currently derived from the practitioner and trade literature. The present study thus advances the currently sparse empirical research in this area.

Table 1. EUCS Instrument Analysis

Items*	Mean**	Factor Loading	Cronbach's Alpha
C1 Does the system provide the precise information you need?	3.12	.722	
C2 Does the information content meet your needs?	3.59	.729	
C3 Does the system provide reports that seem to be just about what you need?	3.22	.865	
C4 Does the system provide sufficient information?	2.90	.792	.7909
A1 Is the system accurate?	3.90	.850	
A2 Are you satisfied with the accuracy of the system?	3.84	.847	.6403
F1 Is the output presented in a useful format?	3.49	.821	
F2 Is the information clear?	3.47	.766	.5214
E1 Is the system user-friendly?	2.44	.770	
E2 Is the system easy to use?	2.24	.856	.5689
T1 Do you get the information you need in time?	3.26	.859	
T2 Does the system provide up-to-date information?	3.45	.818	.6342

\*C=content, A=accuracy, F=format, E=ease of use, T=timeliness; \*\*1=almost never, 5 almost always

## References

- Adams, D. A., Nelson, R. R., and Todd, P. A. "Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication," *MIS Quarterly* (16:2), 1992, pp. 227-247.
- Bailey, J. E., and Pearson, S. W. "Development of a Tool for Measuring and Analyzing Computer User Satisfaction," *Management Science* (29:5), May 1983, pp. 530-545.
- Bikson, T. K., and Gutek, B. *Implementation of Office Automation*. Santa Monica, CA: Rand Corporation, 1984.
- Cooke, D. P. and Peterson, W.J. *SAP Implementation: Strategies and Results*, The Conference Board, Research Report 1217-98-RR, 1998.
- Crowley, A. "Training Treadmill—A Rigorous Plan of End-User Education is Critical to Whipping ERP Systems into Shape," *PC Week Online*, January 4, 1999.
- Davenport, T. H. "Putting the Enterprise into the Enterprise System", *Harvard Business Review* (16:4), July-August 1998, pp.121-131.
- DeLone, W. H., and McLean, E. R. "Information Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), 1992, pp. 60-95.
- Doll, W. J., and Torkzadeh, G. "The Measurement of End-User Computing Satisfaction," *MIS Quarterly* (12:2), 1988, pp. 259-274.
- Doll, W. J., Xia, W. and Torkzadeh, G. "A Confirmatory Factor Analysis of the End-User Computing Satisfaction Instrument," *MIS Quarterly* (18:4), 1994, 453-461.
- Essex, P. A., Magal, S. R., and Masteller, D. E. "Determinants of Information Center Success," *Journal of Management Information Systems* (15:2), Fall 1998, pp. 95-117.
- Hendrickson, A.R., Glorfeld, K., and Cronan, T. P. "On the Repeated Test-Retest Liability of the End-User Computing Satisfaction Instrument: A Comment," *Decision Sciences* (25:4), 1994, pp. 655-667.
- Ives, B., Olsen, M., and Baroudi, J. J. "The Measurement of User Information Satisfaction," *Communications of the ACM* (26:10), October 1983, pp. 785-793.
- Mahapatra, R. K., and Lai, V. S. "Intranet-Based Training Facilitates ERP System Implementation: A Case Study. *Proceedings of the Fourth Americas Conference on Information Systems*, Hoadley, E. D., and Benbasat, I. (Eds), Baltimore, Maryland, (August 1998), pp. 1070-1072.
- Marion, L. "The 15% Solution", *Datamation*, May 1998, accessed at [www.datamation.com/entap/05erp.html](http://www.datamation.com/entap/05erp.html), 1/7/2000.
- Martinsons, M. G., and Chong, P. K. C. "The Influence of Human Factors and Specialist Involvement on Information Systems Success," *Human Relations* (52:1), 1999, pp. 123-152.
- McHaney, R. and Cronan, T. P. "Computer Simulation Success: On the Use of the End-User Computing Satisfaction Instrument: A Comment," *Decision Sciences* (29:2), Spring 1988, pp. 525-536.
- Simon, J. L., and Burstein, P. *Basic Research Methods in Social Science* (3<sup>rd</sup> ed.). New York: NY: Random House, 1985.
- Slater, D. "The Hidden Costs of Enterprise Software," *CIO Magazine*, January 15, 1998, accessed online at [www.cio.com](http://www.cio.com).
- Trunick, P. A. "ERP: Promise or Pipe Dream?", *Transportation and Distribution* (40), 1999, pp.23-26.