

8-16-1996

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### Recommended Citation

Auer, Timo, "Barriers to Quality IS Utilization" (1996). *AMCIS 1996 Proceedings*. 80.  
<http://aisel.aisnet.org/amcis1996/80>

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# Barriers to Quality IS Utilization

by

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## Introduction

The main concern in assimilation studies has been the rapidity of adoption among potential adopters, and a lot of literature exists about independent variables having an impact on the assimilation of Information Systems (IS) at both the individual and organizational levels (Applegate, 1991; Cohen & Levinthal, 1990; Cooper & Zmud, 1990; Damanpour, 1992; Davis et. al, 1989; Grover & Goslar, 1993; Igarria, 1990; Kwon & Zmud, 1987; Leonard-Barton & Deschamps, 1988; Rogers, 1983; Teece, 1992). We have a good understanding of the factors facilitating IS assimilation and effective use, but there is a lack of instruments to identify the state of IS utilization in an organizational context. Due to the lack of explicit measures, management is unable to identify the value (Brynjolfsson, 1993) or the actual problems (Auer, 1995) in IS utilization. Thus, management is inclined to make faulty judgments, which may lead to productivity problems (Brynjolfsson, 1993).

A possible explanation for such productivity problems is that barriers exist in an organizational context to quality IS utilization. A barrier may originate from structural, managerial, user or Information Technology (IT) specific issues, or a combination thereof. Before effective development efforts can be directed and IS can be effectively utilized, we have to be able to identify these barriers.

The aim of this research project is to identify barriers to quality IS utilization. In order to fulfill the research objective, both a framework and a research instrument are developed and tested.

## Research Model

Factors exist in organizations that hinder assimilation and the effective use of Information Systems (Argyris, 1990; Attewell, 1992; Beatty & Gordon, 1988; Boynton et. al, 1994; Cohen & Levinthal, 1990; Dodgson, 1993; Kim, 1993; Senge, 1990). Beatty and Gordon (1988) classified these barriers into three categories. First, they identified built-in mechanisms that deterred the adoption and successful use of technology, which they termed structural barriers. Secondly, human barriers refer to hindrances caused by employees' perceptions, skills and biases. Thirdly, they identified the technical barriers hindering IS adoption and successful use thereof.

We adapt the classification presented by Beatty and Gordon, and suggest some changes. First, human barriers should be split into user and managerial categories. An organization's innovative capability is dependent on its prior related knowledge, termed absorptive capacity (Cohen & Levinthal, 1990). The level of absorptive capacity depends both on a potential adopter's ability to recognize [management] the value of new information, and to exploit that information for the organization [users]. Similarly, according to diffusion theory (Rogers, 1983), innovations are initially adopted by organizations rather than individuals, and in most cases an individual cannot adopt a new idea until an organization has previously done so. Problems related to the IT can be blamed on management's failure to direct IS activities in user organizations; the usage problems also may reflect on management's shortcomings (Auer, 1995).

Secondly, barriers may occur due to incompatible components (i.e. users, management, IT). Before the quality of IS utilization can be improved, all the components must be in balance (Auer, 1995; see also Kwon & Zmud, 1987). Concentration on one component may lead to a situation where the interaction between the components becomes dysfunctional.

Altogether, the barriers may originate from 1) structural, 2) managerial, 3) user or 4) technical factors, or 5) from a combination thereof. In this study, these barrier categories are treated as independent variables.

The dependent construct is the perceived quality of IS use. Quality is measured by the degree to which information systems have a positive impact on an organization's efficiency, profitability, decision making, control, communication processes and possible reorganization (see Saarinen & Vepsalainen, 1993).

## Research Design

It is seen here that a measurement instrument should be developed through the adoption of a long-term, multi-study perspective (see Galliers, 1991; Zmud, 1991). Several studies made in sequence allows for the critical evaluation of the research instrument itself and results in cumulative knowledge of the research area. This study represents the second phase of a longer research project. The first phase (see Auer, 1995) provided both a tentative conceptual framework and a research instrument. The study was based on a longitudinal action research project in a Finnish company.

In this study, the second phase, the empirical data will be collected from six organizations with a questionnaire and follow-up interviews, three US companies and three Finnish. The study concentrates on IS utilization as *perceived by users*. Users have been selected as the target, since they have the most concrete understanding of IS utilization in a work situation.

The questionnaire will be pretested in two phases. First, IS academics and practitioners will review the instrument. Secondly, the questionnaire will be sent to one company (a random sample of users) in order to evaluate the validity and reliability of the instrument. Finally, the modified (if necessary) questionnaire will be sent to the rest of the companies. The reliability and validity of the instrument will then be tested again. The factors associated with the quality of IS use will be analyzed using correlation and regression analysis and the quantitative analysis will be followed by interviews with selected representatives of the object organizations. The follow-up interviews will be used to connect the results gained with the questionnaire to organizational reality.

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