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Appropriation of Information Technology: A Requisite for Improved Individual Performance

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Abstract

Numerous studies have assessed the relationship between information technology (IT) usage and individual performance. However, the empirical evidence on the subject is mixed and contradictory. This paper argues that the current state of empirical research is due to a failure to understand the interplay between IT usage and performance. It argues that the relationship between IT and performance materializes through an appropriation process resulting in two fits: a fit between IT and the task and one between IT and the user. The main premise of this paper is that IT leads to enhanced performance only when this double fit exists.

IT and User Performance

In 1990, U.S. businesses invested about \$61 billion in IT hardware, \$18 billion in purchased software, and \$75 billion in data processing and computer services (Attewell, 1994), most of which in the hope of improving user performance. However, research has failed to provide a clear understanding of the effects of these investments on user performance (Brynjolfsson, 1993; Goodhue and Thompson, 1995; Pinsonneault and Rivard, forthcoming). For instance, several authors argued that it is the *fit between IT and users' characteristics* that leads to better performance. However, the empirical evidence is either inconclusive (Aldag and Power, 1986; King and Rodriguez, 1978; Shara, Barr and McDonnell, 1988), or contradictory. Some studies indicate that the fit between IT and the user lead to greater confidence in the decision made (McIntyre, 1982), improved decision quality, and increased number of alternative solutions generated in problem-solving (Cats-Baril and Huber, 1987), whereas others found IT to lead to decreased levels of confidence in the decision made (Cats-Baril and Huber, 1987), and fewer alternative solutions generated (Goslar, Green and Hughes, 1986). Still, Vessey and Galletta (1991) found partial support for the linkage between 'cognitive fit' and performance.

Other researchers focused on the effect of the *fit between IT and the task*, or lack of thereof, on user performance. Taken together, these studies analyzed several ITs (e.g., computer mediated communication systems, decision support systems, office automation, record systems) in different organizational contexts (e.g., private organizations, city governments), and measured performance differently (e.g., decision quality, perceived benefits, effects on jobs, and productivity). As such, it is not surprising that the empirical evidence on the subject is fragmented and mixed. For example, Millman and Hartwick (1987) found that office automation had led to a variety of changes that made middle managers jobs more enriching and satisfying, while Kraut, Dumais and Koch (1989) found that service representatives' job became quicker and easier to do but also less satisfying and deskilled following the introduction of a record system.

Hence, although numerous studies have analyzed the interplay between IT and user performance, research has failed to provide a clear understanding of the phenomenon. We argue that this state of empirical research results from adopting a too narrow perspective on the IT--user performance relationship, focussing only on one type of fit at the time. Following Goodhue (1992) and Goodhue and Thompson (1995) who draw insights from two complementary streams of research (user attitudes as predictors of utilization and task-technology fit as a predictor of performance) providing a strong theoretical basis to study the relationship between IT and individual performance, this paper argues that this phenomenon is much more complex than originally thought and that *for IT to have any significant effects on performance, both the IT-user fit and the IT-task fit must be present*. In an effort to shed light on this phenomenon, we propose a framework that follows this line of thought and integrates the two types of fit.

Conceptual Model

Central to our framework, presented in Figure 1, is the concept of appropriation (Chin, Gopal and Salisbury, 1997; DeSanctis and Poole, 1994; Giddens, 1984; Sigurdson and Reddy, 1995; Swan, Newell and Robertson, 1995; Tyre and Orlikowski, 1994) by which both IT-task and IT-user fits can be reached. The literature suggests that IT appropriation includes both the technical modifications that users make to the technology and the changes they make in their competencies, work procedures, and habits. These modifications imply the constructive use of an appropriate IT for the task and the user. Hence, we propose two dimensions of appropriation, namely, adaptation and adjustment. *Adaptation*, is the process of assuring a fit between the technology and the user. It implies modifications at the behavioral and knowledge levels, in terms of working habits and new skills required to efficiently use the technology, and the modifications brought to the technology in order to augment its conformity with the user's

Adjustment (IT-Task fit)		NON-ADAPTATION (IT-user mis-fit and IT-task fit)		APPROPRIATION (IT-user and IT-task fit)	
		High		High	
Low		NON-ADAPTATION (IT-user mis-fit and IT-task fit)		NON-ADJUSTMENT (IT-user fit and IT-task mis-fit)	
		Low		High	
		Expected impact on performance: none		Expected impact on performance: ↑	
		Expected impact on performance: ↓		Expected impact on performance: none	
		Adaptation (IT-User fit)			

Figure 1. Appropriation of IT and Performance

and with the task's characteristics. Positive impacts of IT on performance are expected. The quadrant labeled '*non-appropriation*' represents a situation where the technology does not fit with neither the user and the task. In this situation, we expect that IT usage will actually be detrimental to performance. In the '*non-adaptation*' quadrant, there is a fit between the task and the technology but the IT-user fit is lacking. In this situation, the effects of the fit and mis-fit are likely to cancel each other so, in this situation, IT usage is expected to have no significant impact on user performance. Finally, in the quadrant labeled '*non-adjustment*', the technology does not fit with the task, but it fits the user's characteristics. As in the non-adaptation quadrant, the impacts of IT usage on performance are expected to be negligible.

It is believed that, embedded in a theoretical framework linking IT to individual performance, IT appropriation can lead to a better understanding of why and how IT might affect user performance.

Further, it implies that a given technology applied to a specific task will result in different impacts depending on one's appropriation of IT. This might help understand the state of empirical findings by showing the complementary natures of the IT-task and IT-user fits.

Hence, while Goodhue and Thompson (1995) found that to predict individual performance, both task-technology fit (TTF) and utilization must be included, evidence of a causal link between TTF and utilization was more ambiguous. In this perspective, while Goodhue and Thompson (1995) hypothesize that user evaluations of TTF will influence the utilization of IT, this paper argues that both IT-task and IT-user fits can only be reached through two recursive processes (adaptation and adjustment) that cannot take place if the technology is not used. Hence, the present study is based on two important assumptions. First, that IT appropriation is a behavior which, together with utilization, impacts on individual performance. Second, that utilization of IT is a required antecedent of its appropriation.

In light of the above, it is believed that IT appropriation can better be studied within a behavioral model. A current study uses Triandis' (1980) Theory of Interpersonal Behavior in order to explain and understand IT appropriation and relate it to individual performance. Triandis' model assumes that a given behavior is determined by the individual's affect toward that behavior, social norms in the work place, work habits, expected consequences of performing the behavior, and facilitating conditions in the environment conducive to it. These five factors are expected to influence IT appropriation, which is expected

preferences. *Adjustment*, on the other hand, is the process of facilitating the fit between IT and the task it supports by modifying the technology, the work process, or both. Consequently, IT appropriation refers to the process leading to a double-fit, one between IT and the user, and one between IT and the task. These two dimensions of IT appropriation form the 2 X 2 framework illustrated in Figure 1. The fundamental premise of this framework is that the impacts of IT usage on user performance depend on the degree of appropriation of IT by the user. The higher the appropriation, leading to better IT-task and IT-user fits, the greater the performance improvement associated with IT usage. In reverse, with a lack of appropriation, resulting in mis-fits between IT and the task and/or between IT and the user, IT will be associated with decreased performance. The quadrant labeled '*appropriation*' represents a double-fit, that is, the technology fits with the users'

to mediate the relationship between IT utilization and individual performance. An empirical study is under way to test and refine the proposed model.

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