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Understanding the Use of Information Technology: Application of The UTIP Framework

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Abstract:

Considerable research effort has been expended in attempts to understand and model factors which influence the use of information technology, and several complementary and competing models have been formulated. Thompson (1996) proposed a general framework (UTIP - Utilization of Technology and Individual Performance) which provides linkages from characteristics of an information technology through to individual performance resulting from use of the technology. This study used a subset of the UTIP model to investigate factors influencing the adoption of one new technology, specifically Microsoft's Access Database Management System.

Introduction

Understanding the factors which influence the adoption and use of Information Technology (I/T) by individuals is one of the important issues which continues to interest Information Systems (I/S) researchers. If an information system is not used, it can not improve the efficiency nor effectiveness of an individual. If a system is used, but it does not match well with the requirements of the job task, the improvement may be minimal. Research investigating the adoption and use of I/T is motivated by the desire to help understand, predict, and to some extent control the factors which influence I/T use.

In recent years, the Technology Acceptance Model (TAM) proposed by Davis (1989) has become very popular. The TAM model has the benefit of being parsimonious, and numerous studies have shown it to be effective in explaining intentions to use technologies, as well as actual usage behavior. Thompson (1996) incorporated aspects of TAM, along with components of several competing and complementary models (e.g., Moore and Benbasat, 1991; Thompson, Higgins and Howell, 1991; Compeau and Higgins, 1995; Goodhue and Thompson, 1995), in the development of the UTIP (Utilization of Technology and Individual Performance) framework. The UTIP framework is general in that it encompasses 19 constructs, starting with factors such as task characteristics and characteristics of the technology, and linking them all the way through to individual performance. The framework is specific in that it proposes explicit linkages among all constructs, including moderating and mediating effects and feedback loops.

The intent of the UTIP framework is not that it be used in its entirety, but rather to allow researchers to select a subset of the framework to address a specific research or practical agenda. That is the approach that was used for this study.

The objective of this study was to investigate the relative influence of important factors on intention to use information technology. This research objective was refined to address: (1) intention to use for a short-term, well-defined task, and (2) intention to use longer term, for anticipated future tasks. By including both types of intention, it is possible to see if the relative influence of different factors changes from one context (short term, well-defined task) to the other (long term, undefined tasks).

The technology under investigation was Microsoft's Access, which is a Database Management System (DBMS). The subjects were undergraduate students who completed a required junior-level course in
management information systems. The immediate task was for the students to develop a prototype information system which satisfied certain criteria, and also to complete a written project report.

All students in the study owned personal computers. Some students had ready access to the DBMS on their own personal computers. Access was also available on a limited basis in a small lab, or through purchase by the individual students. The project was completed in groups of two. Although all students were encouraged to become familiar with Access, it was possible for them to split the tasks and have one student concentrate on completing the prototype while the second focused on writing the accompanying project report.

Figure 1 shows the theoretical model employed in this research. The approach used in determining the appropriate constructs and relationships from UTIP was relatively straightforward. First, a limit was established in terms of the length of a research instrument (questionnaire), which dictated the practical limits of how many constructs could be employed. Next, each of the constructs and relationships in UTIP were examined with the intent of determining which would be expected, a priori, to exert the strongest influence on Intention to Use. Previous research (which had been used in the development of UTIP) was used to help make this determination.

One additional factor, motivation to complete the task, was also added. It was proposed that motivation will influence intention to use the technology. Although this construct was not an explicit part of the UTIP framework, it was hypothesized that motivation to do well on the course project could provide a very strong influence on intention to use Access. If the results support this proposition, the UTIP model will be modified to take this into account.

Table 1 lists the constructs included in the research model, and provides a very brief explanation of the definition and origin of the construct. Measures of the constructs were adapted from previous work. For example, the measures for computer self efficacy were taken from those developed by Compeau and Higgins (1995). A pretest of the research instrument was conducted with 48 respondents, to help refine the measures. As a result of the pretest, several changes were made, including a decision to remove one construct and to add three others. It was also determined that some improvements were needed for the measures, especially measures of intentions to use the technology (a key construct in the model). Data for the study were collected from 65 respondents during April 1997, and will be analyzed using the Partial Least Squares (PLS) analysis technique.

The analysis will be run first with short-term Intention to Use as the primary dependent variable, and then a second time with long-term Intention to Use. Paths in the model will be compared to see what (if any) differences occur between the two contexts. For example, it could be proposed that Performance Expectations (which are shorter term in focus) will have a stronger influence on short-term Intention to Use than on the longer term Intention to Use.

The results will be available for the AIS meeting in August 1997. A longer version of this paper will be available at that time.

Table 1

<table>
<thead>
<tr>
<th>Relevant Expertise (relevant experience, skill, training)</th>
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<tr>
<td>- Experience; Prior Performance (Thompson et al., 1994; Compeau &amp; Higgins, 1995)</td>
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<tr>
<th>Perceived T/T Fit (belief about how well the technology matches the task)</th>
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<tr>
<td>- Task/Technology Fit (Goodhue &amp; Thompson, 1995)</td>
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Self Efficacy (belief about ability to learn to use new IT; Compeau & Higgins, 1995)

Social Image (beliefs about how referent others will view my use of the IT)

Performance Expectations (belief that use will result in certain performance outcomes)
- Perceived Usefulness (Davis, 1989; Davis et al., 1989; Taylor & Todd, 1995)
- Outcome Expectations; Job Fit (Compeau & Higgins, 1995; Thompson et al., 1994)

Complexity Beliefs (perceived difficulty - or ease - of using IT)
- Ease of Use (Davis, 1989; Davis et al., 1989; Taylor & Todd, 1995)

Personal Expectations (belief that use will result in certain personal outcomes)
- Personal Outcome Expectations (Compeau & Higgins, 1995)
- Long Term Consequences of Use (Thompson et al., 1991, 1994)

Affect (feelings of like/dislike related to use of the IT)
- Affect (Thompson et al., 1991, 1994)
- Attitude (Davis, 1989; Davis et al., 1989)

Perceived Control (perceived control over decision of whether or not to use the IT)
- Voluntariness of Use (Moore & Benbasat, 1991)
- Facilitating Conditions (Thompson et al., 1991, 1994)
- Perceived Behavioral Control; (Taylor & Todd, 1995)

Intention to Use (intent to use IT; Davis 1989; Davis et al., 1989; Taylor & Todd, 1995)

References


Figure 1
Research Model