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# GOING BEYOND TAM TO PREDICT E-MAIL USE IN EASTERN EUROPE: A FOCUS ON THE SLOVAK REPUBLIC

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## Abstract

*Much research in the last two decades has investigated the acceptance and use of information technology in North America. In fact, many studies have investigated a range of IT applications, including email, where the application is readily available. However, what about areas of the world where these technologies are not readily available? Does TAM still hold? Is it enough to predict email use? This study explores the TAM model in a developing country in Eastern Europe, Slovak Republic, and attempts to look at factors other than the technology that could impede use.*

**Keywords:** Technology Acceptance Model, cross-country studies, Eastern Europe, Slovak Republic, IT adoption and diffusion

## Introduction

There have been numerous studies using the technology acceptance model (TAM) (for example, Davis 1989; Szajna 1996; Straub et al. 1997; and Venkatesh and Morris 2000); however, only a small number have attempted to apply the model outside of North America. Straub, et al. (1997) tested the model across three countries: Japan, Switzerland, and the United States. Extending that work, McCoy and Everard (2000) investigated the effects of culture on TAM in Latin America, and later found that TAM held when tested in the US and Uruguay (McCoy et al. 2003). This study will extend the work of these researchers by testing TAM in Eastern Europe with email use. The first Eastern European country in which TAM will be tested is Slovak Republic. In addition, the study will attempt to look beyond the system factors (TAM), and investigate other factors that may affect email use by the general population. Slovak Republic is one of the countries in Eastern Europe that are selected to join EU in 2004, and therefore, for this study Slovak Republic is deemed representative of Eastern European countries; future studies will examine other Eastern European countries, such as Czech Republic and Poland.

## Prior Research

### *Technology Acceptance Model*

Davis (1989) developed the TAM model to predict acceptance of technology by users. In his work, Davis posits that users develop perceptions about the usefulness and ease-of-use of technologies, and that these perceptions influence intention to use a system.

## **Other Factors**

In addition to technology or system factors, such as the perceived usefulness and perceived ease of use, we identify two factors that could prevent system use. These factors are Information and Communication Technology (ICT) infrastructure and Costs.

## **ICT Infrastructure**

To enable the diffusion and use of telecommunication technologies like the World Wide Web or Email, a country needs a solid ICT infrastructure (Adam 1996; Mbarika 2001). Telecommunications infrastructure is generally measured in terms of teledensity, the number of land telephone lines per 100 inhabitants (for a review, see Mbarika et al. 2002; Mbarika et al 2001). However, with the increasing spread of wireless telecommunications in Eastern Europe and elsewhere, a broader perspective should be used in identifying ICT infrastructures (Kibati and Krairit 1999; Peha 1999). Due to socioeconomic and political problems faced by many Eastern European countries, the region has been reported to have lower levels of most ICT-related infrastructures compared to Western Europe and North America. In fact, teledensity in the Slovak Republic is 32 (Ministry of Transportation, Posts, and Telecommunications of the Slovak Republic) compared to 69 in the US (CIA Factbook).

## **Costs**

The other factor, as outlined above, is costs. The costs of computers and other ICT-related equipment are comparable to that of North America, but the average wage is much lower in Eastern Europe. For example, in North America the average daily wage is \$80 and the average cost of a computer is \$1,000 (UNICTTF 2002). This is compared to the average daily wage of \$12 (Statistical Office of the Slovak Republic) in Slovak Republic, with the same average computer cost of \$1,000—though often higher when customs charges are added. In addition to the cost of the equipment, like a computer and modem, the cost of Internet Access is much higher. For example, in the US, the average cost of dial-up service per month is \$15. Unlimited broadband access, such as DSL or cable, as per several websites, costs around is \$50. This is compared to the average dial-up service and broadband access per month of \$16 (LTC Slovakia) and \$314 (ITEL Slovakia), respectively in Slovak Republic (Note: the ADSL is not available at this moment).

## **Proposed Study and Model**

As outlined in the research model (Figure 1), this study attempts to investigate the use of the TAM model in Eastern Europe and seeks other factors that may impede intention to use a technology that is perceived as being both useful and easy to use.

This study proposes that the TAM model published by Davis (1989) will hold when tested with the sample from the Slovak Republic. In this research, perceived usefulness (PU) refers to the prospective users subjective probability that using email will increase performance. Perceived ease of use (PEU) refers to the degree to which prospective users feel that email will be free from effort. In the current TAM model, PU and PEU both directly affect behavioral intention. Behavioral intention measures the strength of a person's intention to perform the behavior, and is a major determinant of actual use (Davis 1989). In addition, Hill et al. (1987) showed that behavioral intention significantly predicts actual behavior. Therefore, if one's behavioral intention is high; the likelihood that the action will occur is high. In addition, PEU directly affects perceived usefulness. The rationale here is that the easier the system is to use, the more useful the user will perceive it to be. Based on previous research testing this model in the US (Davis, 1989; Venkatesh and Davis 2000) and abroad (Straub, et al. 1997; McCoy et al. 2003), we expect:

*H1: The TAM model will hold in the Slovak Republic sample*

*H1a: Perceived Usefulness positively affects Behavioral Intention*

*H1b: Perceived Ease of Use positively affects Behavioral Intention*

*H1c: Perceived Ease of Use positively affects Perceived Usefulness*

In addition to the TAM constructs, this research also looks at the ICT Infrastructure and the costs of ICT equipment and Internet access. These factors are expected to affect the use of email (or any Internet application). Therefore, we hypothesize:

*H2: The less advanced the ICT Infrastructure, the lower the use of email.*

H3: The higher the costs of ICT equipment, the lower the use of email.

H4: The higher the costs of Internet access, the lower the use of email.

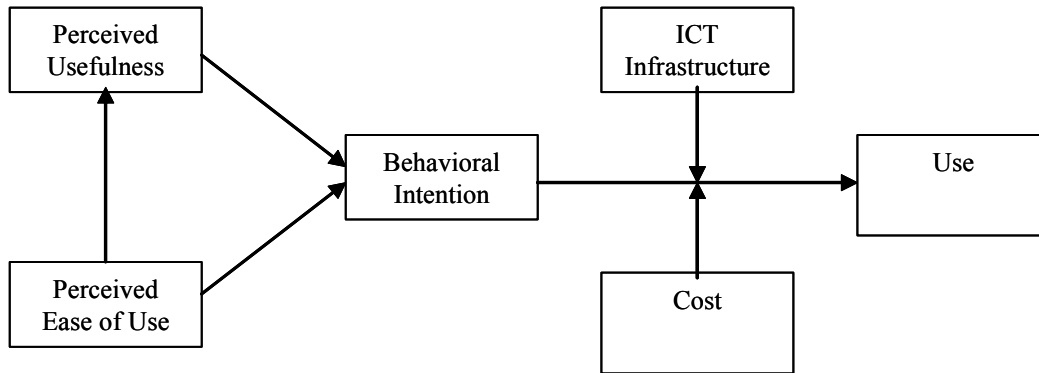


Figure 1. Research Model

## Research Method, Proposed Analysis and Expected Results

This study will utilize a survey instrument to collect data on the TAM constructs in the model. In order to test how well the TAM model explains variance in intention to use email within the Eastern European sample, linear regression will be used. Behavioral intention to use email will be used as the dependent variable and perceived ease of use and perceived usefulness will be the independent variables. These two independent variables will be used in a linear regression model to test their relationship with intentions to use email. In addition, secondary data will be used to determine the costs of equipment and Internet access and the relative ICT infrastructure of the countries in question. These two variables will be used to test the moderating effects on actual use which is also derived from secondary data. All hypotheses are expected to be significant. At the present stage of this research, data will be collected from Slovak Republic; future data collection will take place in other Eastern European countries.

## Discussion and Conclusion

The research conducted by Davis (1989) has had a lasting effect on the IS field. Many studies have used the TAM model. Recent studies tested the TAM model in the US, Japan and Switzerland (Straub et al. 1997) and in the US and Uruguay (McCoy et al. 2003) and illustrated its ability to be used in those countries. However, one recent study (McCoy 2002) calls into question the use of TAM model for all people as the relationships in the model were not as predicted in previous research some subjects in the sample. In addition, the TAM model has always been used to predict usage of readily available technologies. Similarly in this study, we test the TAM model in Eastern Europe with subjects who have access to email to investigate the suitability of using the TAM model in this area of the world. Furthermore, we examine what other factors may impede usage of email in Eastern Europe where factors such as ICT infrastructure and Costs may prevent this technology from being readily available to the general population. This study is an important step in validating the model in this part of the world. However, other factors, such as the ones outlined in this paper should be identified and tested to see what prevents useful and easy to use technologies from being used in other parts of the world.

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