

Chapter 3.7

User Acceptance of Voice Recognition Technology: An Empirical Extension of the Technology Acceptance Model

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ABSTRACT

Voice recognition technology-enabled devices possess extraordinary growth potential, yet some research indicates that organizations and consumers are resisting their adoption. This study investigates the implementation of a voice recognition device in the United States Navy. Grounded in the social psychology and information systems literature, the researchers adapted instruments and developed a tool to explain technology adoption in this environment. Using factor analysis and structural equation modeling, analysis of data from the 270 participants explained almost 90%

of the variance in the model. This research adapts the technology acceptance model by adding elements of the theory of planned behavior, providing researchers and practitioners with a valuable instrument to predict technology adoption.

INTRODUCTION

Supported by the development of easy-to-use and inexpensive technology, the adoption of voice recognition technology (VRT)-enabled devices by businesses and consumers is slated to grow 17% per year, becoming a \$52 billion market by 2007

(Business Communications Company, 2003). Studies in hospital settings illustrate average productivity gains of 30% with the introduction of VRT devices (MedQuist, 2003). Additionally, organizations garner cost savings and the potential for improved security, while consumers are attracted to hands-free operation of personal devices including cellular phones and personal digital assistants. Yet, despite improvements in the technology itself and the potential productivity gains, studies suggest that organizations and consumers are resisting VRT adoption (Costanzo, 2003).

Social psychology and information systems research have extensively explored the adoption of innovations including information technology. A variety of tools have been developed to explain the adoption process, including the widely referenced theory of reasoned action (Fishbein & Ajzen, 1975), theory of planned behavior (Ajzen, 198; Fishbein & Ajzen, 1975), and technology acceptance model (Davis, 1986). This study marks the first time that the adoption of VRT has been explored with these research tools.

The adoption process is explored in this study during the initial implementation of a voice recognition device by the U.S. Navy. The next section describes the situation and the system to be implemented and is followed by a review of the social psychology and information systems literature. Then the research model and study's hypotheses are presented. A description of the data and its analysis is presented followed by the discussion of the findings. The paper concludes with implications and suggestions for future research.

BACKGROUND

Coupling computer recognition of the human voice with a natural language processing system makes speech recognition by computers possible. By allowing data and commands to be entered

into a computer without the need for typing, computer understanding of naturally spoken languages frees human hands for other tasks (Lai, 2000; Shneiderman, 2000). Speech recognition by computers can also increase the rate of data entry, improve spelling accuracy, permit remote access to databases utilizing wireless technology, and ease access to computer systems by those who lack typing skills (Boyce, 2002). The seamless integration of voice recognition technologies creates a human-machine interface that has been applied to consumer electronics, Internet appliances, telephones, automobiles, interactive toys, and industrial, medical, and home electronics and appliances (Soule, 2000). Applications of speech recognition technology are also being developed to improve access to higher education for people with disabilities (Goette, 2000; Leitch & Bain, 2000). Although speech recognition systems have existed for two decades, widespread use of this technology is a recent phenomenon.

Some of the most successful applications have been telephone based. Continuous speech recognition has been used to improve customer satisfaction and the quality of service on telephone systems (Charry, Pimentel, & Camargo, 2000; Goodliffe, 2000; Rolandi, 2000). Name-based dialing has become more ubiquitous, with phone control answer, hang-up, and call management (Gaddy, 2000a). These applications use intuitive human communication techniques to interact with electronic devices and systems (Shepard, 2000). BTexact Technologies, the Advanced Communications Technology Centre for British Telecommunications, uses the technology to provide automated directory assistance for 700 million calls each year at its UK bureau (Gorham & Graham, 2000). Haynes (2000) deployed a conversational interactive voice response system to demonstrate site-specific examples of how companies are leveraging their infrastructure investments, improving customer satisfaction, and receiving quick return on investments. Such applications demonstrate the use of speech rec-

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