



Household Adoption of Technology: The Case of High-Speed Broadband Adoption in Australia



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ABSTRACT

Within the home context a high-speed broadband Internet connection is seen as a key enabler for effective access to and use of the Internet. This article examines the factors contributing to household adoption of high speed broadband in Australia. Building on the Theory of Reasoned Action and seminal research on technology adoption in the home and the workplace, the article presents and evaluates a hypothesized model of Household Adoption of Technology.

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1. Introduction

The last decade has witnessed an unprecedented growth in the use of information technology and the Internet to affect the lives of hundreds of millions of people worldwide. In particular, recent advancements in broadband technology offers the end user the ability to have permanent, high-speed connections to new services, applications and rich content that has practical lifestyle and productivity benefits [1]. It is widely recognised that the Internet has the potential to add significant value to business, government and society in general [2]. The Internet and broadband have long been viewed as important for enhancing economic competitiveness and for sustaining economic growth [3]. Indeed, governments have recognized the significance of the Internet for promoting economic development. For example, the USA National Broadband Plan [4] has stated that the national broadband network should be pushed to unserved areas of the USA to ensure “that all areas of the United States have access to broadband capability” [4].

Several studies have provided support for the proposition that

broadband can have a positive economic and social benefit [5]. Specifically, knowledge creation and dissemination in sub-Saharan Africa [6], broadband impact in household context [7], establishing the Internet as a market place [8], and for delivering multi-media services to the home [9].

Within Australia, the federal government has committed around \$43 billion to the development of the National Broadband Network (NBN), indicating the importance of the project to the national economy [10]. The NBN promises to deliver improvements in healthcare, education, business, and for individual households. However, while government controls the supply, there is less certainty over the demand for broadband. Consequently, the economic and social benefits of broadband can only be realized if there is mass adoption, by industry and consumers [11]. The purpose of this study is to examine the household adoption of high-speed broadband in Australia. Given the significant government investment of \$43 billion, there is a need to understand what factors facilitate or impede the adoption of high-speed broadband.

More broadly in developed and developing economies, democratisation of access to technology has driven large changes in society in recent years; with households now able to access new innovations and technologies that were once only available in organisations. Predicting consumer motivations for adopting innovations is a challenging area. Historically, even those involved in

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the technology industry have been relatively poor at predicting the future needs of households and the underlying motivations for consumer's adoption of innovations. For example:

"There is no reason anyone would want a computer in their home." - Ken Olsen, founder of Digital Equipment Corporation (1977); and, "Next Christmas the iPod will be dead, finished, gone, kaput." - Sir Alan Sugar, founder of Amstrad (2005).

It is important for governments and industry to gain a deeper understanding of household's motivations for adopting technologies and innovations.

More broadly this paper uses broadband adoption as a proxy for the theoretical development of innovation adoption, particularly in household contexts, providing new insights into why consumers adopt technology. The results may be generalized across a range of technologies as to why households adopt innovations and this study highlights the potential limitations in applying existing technology adoption models to household consumers.

The rest of the paper is organized as follows. In the next section we provide a brief review of the literature on adoption of technology as well as examining literature on the adoption of broadband, which is used to develop the conceptual framework and study hypotheses. This is then followed by a discussion of the research methodology, and the results of the findings of the study. The paper then provides a discussion and implications section, along with suggestions for further research.

2. Conceptual framework

The theoretical background to much of the research concerning the adoption of innovations can be traced to the work in social psychology by Fishbein and Ajzen's [12] theory of reasoned action (TRA) which is concerned with the determinants of consciously intended behaviour [13]. In brief, TRA argues that behavioural intention can be explained by both attitudinal and normative influences. Building upon this work, in attempting to explain technology adoption, researchers developed the technology acceptance model, (TAM) which over the last twenty years has become the most widely accepted model in the area of technology adoption. The TAM [14] was designed with the goal of creating a parsimonious general model for modelling user acceptance of information systems within an organizational setting. Key variables in the original TAM are perceived usefulness and perceived ease of use, which are hypothesized to directly affect behavioural intention. The construct perceived usefulness is concerned with the respondent's subjective probability that his/her job performance will be improved as a result of using a specific system within an organizational setting [15]. Conversely, the construct perceived ease of use is concerned with the degree to which the prospective user expects the target system to be effortless [15]. Building upon the original TAM, Venkatesh and Davis [16] developed TAM 2. In brief, TAM 2 extends the original TAM with the inclusion of several variables hypothesized to be antecedents primarily to "perceived usefulness". The TAM has been referred to as the "premier model" in understanding consumers' adoption of new technologies [17]. The model has found support in several consumer adoption studies [17–19].

The TAM is a model developed from studying workplace and organisational adoption. The parsimonious nature of the model makes it appealing for researchers to apply to a wide range of innovation adoptions. This paper questions whether the TAM is suitable for predicting behavioural intention in the household context.

In attempting to understand how consumers adopt technology in a household context, Brown and Venkatesh [20] developed the "Model of Adoption of Technology in Households", (MATH).

Utilizing Fishbein and Ajzen's [12] theory of planned behaviour, MATH proposes three major classes of constructs; attitudinal beliefs, normative beliefs, and control beliefs. Attitude refers to "an individual's positive or negative feeling (evaluative effect) about performing the target behaviour" [12, p. 216]. Brown and Venkatesh [20] separate attitudinal beliefs into those related to utilitarian outcomes, hedonic outcomes and social outcomes. In terms of normative beliefs [20], state that subjective norms capture the effect of social influence on behaviour. In essence, this refers to the individual's perception as to whether others who are viewed as being important believe that the individual should engage in a particular behaviour [15]. With regards to control beliefs [20], argue that "these can be separated into internal abilities and constraints (e.g. self-efficacy) or external constraints, (e.g. environmental constraints)" (p. 400). In brief, Brown and Venkatesh [20] find that the baseline MATH model explained 50% of the variance in behavioural intention to adopt a personal computer. While technology adoption has been studied extensively in the workplace with the wide application of popular models such as TAM [14,16]; we concur with the view of Brown and Venkatesh that there is a need for an alternative model to explain technology adoption in the household. We argue MATH can be improved to explain a greater proportion of the variance in behavioural intention and this study extends MATH, drawing on the results of [20] empirical testing of the model, as well as on the results of a qualitative study during which the additional construct of purchase complexity emerged. In the following section we present the model for the study along with the corresponding hypotheses. The proposed Household Adoption of Technology (HAT) conceptual model is presented in Fig. 1.

2.1. Lifestyle compatibility

The adoption of technology within organizations is typically characterized by an emphasis on how well the technology improves productivity. Thus, variables such as perceived usefulness and relative advantage have consistently been found to be strong predictors of adoption and usage behaviour [21]. Within the household setting, we expect that consumers will be looking for technology that provides both a utilitarian and a hedonic benefit, i.e., technology that improves the productivity of the household, and also provides fun and enjoyment. In the context of this study, lifestyle compatibility is defined as "the degree to which an innovation is perceived to be consistent with current household needs" and is an example of both extrinsic motivation (utilitarian) and an intrinsic motivation (hedonic). This view is consistent with that of Crowley, Spangenberg, and Hughes [22] who argue that different products can be high or low in both hedonic and utilitarian attributes. We expect that utilitarian outcomes, and hedonic outcomes in the form of "lifestyle compatibility" will influence the adoption of high-speed broadband in the home. This view is based both on our review of the literature, and on interviews with respondents during a qualitative phase of the study who stated the need for technology such as broadband to provide a functional and enjoyment benefit.

Babin, Darden and Griffith [23] propose the construct of "hedonic value" which reflects shopping's potential entertainment and emotional worth. In brief, "the purchase of goods may be incidental to the experience of shopping. People buy so they can shop, not shop so they can buy" [24, p. 428]. Building upon this line of reasoning [21], proposed and found support for hedonic outcomes to influence the decision to adopt a personal computer in the household. This is based on the fact that modern PC's provide consumers with the opportunity to play online games, escape reality, and thus exhibit characteristics consistent with a hedonic perspective [25].

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