

**INTERNET ACCEPTANCE AND USE BY SMALL FIRMS: A STUDY OF THE
PHARMACY SECTOR**

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INTERNET ACCEPTANCE AND USE BY SMALL FIRMS: A STUDY OF THE PHARMACY SECTOR

The Internet has grown enormously over the past two years and provides small firms with opportunities to communicate with stakeholders, advertise their products, and transact their business. However, in Australia, less than half of small firms are taking advantage of this new IT development. This paper explores factors associated with IT acceptance and use by small firms in the pharmacy sector. Specifically, it focuses on firms that have previously used IT. A model is developed relating past IT benefits experienced and anticipated future Internet-based competitive advantage to the adoption and use of the Internet. The study also differentiates between potential adopters and users to examine the strength of the relationship between attitude and behavioural intent. Structural equation modelling (EQS) is used to test the model and three of the four hypotheses are confirmed. Results show that the likelihood of Internet use for potential adopters and the extent of Internet use for users is affected directly by both past IT benefits experienced and anticipated future Internet-based competitive advantage. Findings also show the relationship between attitude and behavioural intention to be stronger for potential adopters of the Internet than for users. This model is the first stage of a more comprehensive study of factors affecting small business Internet use.

Introduction

The acceptance and use of the Internet by small businesses has grown substantially over the last few years. In 1999 the number of small firms in Australia which were Internet connected was 48%, doubling the 1997 level (Yellow pages Small Business Index, 1999). Since the late eighties, when the reduced cost of computer hardware and software enabled small firms to invest in information technology (IT), managers and employees in these firms have gained experience and developed skills in adopting and adapting to new technologies. In particular, the growth of the Internet has provided opportunities for small firms to compete with larger corporations as communication, information and marketing resources are available for a relatively low financial outlay. However, some firms are reluctant as yet to take advantage of the Internet while other firms with Internet access are using it minimally.

The aim of this paper is to examine factors impacting on the uptake and use of the Internet by pharmacists as an example of small business. Specifically, it investigates pre-adoption and post-adoption attitudes and behaviours related to the Internet. The pharmacy sector was selected for investigation because a sizeable proportion of pharmacies in Australia falls into the small business category and they are part of the healthcare industry which is experiencing massive

strategic and structural changes and rapid IT developments. Pharmacies are therefore a useful barometer at a micro level of wider industry IT forces.

Internet issues in the pharmacy sector

Firms, using IT to compete, not only need to choose the right technology to meet customers needs, but need the right partners to help them implement it (Brown, 1996). IT developments in the pharmacy sector embrace a wide range of players such as wholesalers, government organisations, customers and professional associations. These stakeholders influence adoption, implementation and strategies undertaken. In particular, professional associations play an important role in introducing and providing Intranets to their members, and guiding them through the plethora of industry related Web-sites. In the Australian pharmacy sector, the Pharmacy Guild has developed an Internet site that has the facility to allow pharmacies to benchmark practices and to interface with any dispensary point-of-sale system (Bell, 1998). It has also initiated an Intranet to provide pharmacists with up-to-date, timely information and access to data bases such as Medline. An Intranet can be important as a springboard for firms to communicate with customers and obtain external data (McCollom, 1998). Pharmacists are therefore being led into the Internet through the Guild initiative.

New technological developments such as the Internet can affect the basis of competition in an industry. In the pharmacy sector, community pharmacists are facing new competitors. As more consumers go on the Internet to shop, virtual drugstores are selling over-the-counter medications and health and beauty products. Currently, the emergence of virtual pharmacies such as Larry's Virtual Pharmacy (www.liberty.com), which claims to be the first Internet pharmacy, presents a potential threat to brick and mortar pharmacies. These Internet pharmacies offer easier access, speed and convenience but also raise concerns regarding issues of privacy and safety (Landis, 1999). In terms of drug distribution, for example, the Internet has opened doors for profiteers to sell medications to anyone with or without a prescription (Ukens, 1999).

If community pharmacists wish to compete, they need to provide the same Internet-based benefits combined with high levels of patient/customer service. Pharmacists will continue to manage drug distribution, but it is argued that advances in technology should be linked to better services for patients (Beardsley, 1996) and that the economic future of pharmacists lies

predominantly in-patient care services (Felkey and Barker, 1996). The Web provides opportunities for pharmacists to access to the latest, timely pharmacy knowledge to assist patient care and, to this end, the Internet is a powerful tool for enhancing customer service. Previous research shows that firms that achieved the highest customer satisfaction levels took a holistic approach combining customer needs, technology and process (Brown, 1996).

For small pharmacists in particular, the Internet appears to have important advantages. It is claimed that the Internet presents opportunities to create and implement new ways of doing business, is a low-cost advertising medium, has low barriers to entry and will enhance a firm's perceived image (Nath, 1998). In addition to its effectiveness for marketing, it can enable efficient direct-line selling, research, communication and collaboration for both large and small businesses (Cockburn and Wilson, 1996). Moreover, firms on the Internet are more visible to competitors and consumers, and smaller firms that set up a Website are able to compete by virtue of its presence (Guthrie and Austin, 1996). For small businesses, the ability to compete more effectively with larger organisations by using the Internet is a significant advantage. Some suggest that small firms are setting the standards for sites that successfully draw on-line viewers (Freedman, 1996).

Despite these optimistic scenarios, a number of small firms are choosing not to adopt this new technology. Moreover, firms that do have access to the Internet may not use it to its full potential. Several reasons may be offered to explain this situation. First, owners often fail to recognise the competitive advantage to be gained from the Internet (Kaplan et al, 1997). Second, those firms that have experienced using IT may consider that they failed to gain the benefits promised by IT vendors and the media. For instance, the level of IT knowledge, organisational resources and external support will affect the ability of smaller firms to use their IT effectively (Geisler, 1992; Ray et al, 1994; Winston and Heiko, 1990; Ianocou et al, 1995). A further inhibitor is that the Internet is still at an early stage for many businesses, and issues relating to security, privacy, payment and intellectual property still need to be solved (Corbin, 1996).

Information technology adoption and use in small business

Research into adoption and use of IT by small firms has spanned two decades. In the 1980s, several studies were undertaken that investigated the impact of computer training on usage

behaviour and attitudes (Raymond, 1988), success factors for IT use (DeLone, 1988) and IT end-user satisfaction (Montazemi, 1988). These studies found that extent of usage was increased by computer education and training (Raymond, 1988), that IT success factors included managerial IT knowledge and involvement in computerisation of the firm (DeLone, 1988) and that higher user satisfaction was generated by end user literacy and participation (Montazemi, 1988).

Other researchers focused on IT adoption (Davis et al, 1989) and used the Technology Acceptance Model (TAM) to trace 'the impact of external factors on internal beliefs, attitudes and intentions' (Davis et al, 1989:985). In the 1990's interest in small business increased and TAM was used in a modified form by several researchers (eg Igarria et al, 1997; Ferguson, 1997) for determining IT acceptance. It has proven successful in predicting and explaining usage over a variety of systems (Igarria et al, 1997).

Studies were also undertaken to investigate factors impacting on IT growth and small firm-large firm linkages. They found that an important motivator of IT growth was improved enthusiasm for the technology whereas inadequate resources and limited education about information systems inhibited growth (Cragg and King, 1993). They also showed that electronic linkages with larger organisations benefited small firms that could take advantage of the IT knowledge and resources of these organisations (Gales and Blackburn, 1990).

Achieving competitive advantage is 'perhaps one of the most important reasons that firms consider investing in a particular IT' (Harrison et al 1997:171). In their model of adoption, Iacovou and his associates (1995) propose that adoption of IT is influenced by external pressure, organisational readiness and perceived benefits related to the recognition of the relative advantage to be gained by the IT network. Their results showed that perceived benefits is a significant factor for EDI adoption. More recently, Poon and Swatman (1999) also found this factor as a key reason for the adoption and continued use of the Internet. This paper proposes that these benefits gained will lead to a belief that the Internet will provide a competitive advantage which is also likely to influence the decision to adopt or increase the extent of Internet use.

Many small firm managers have now had the opportunity to progress over the years to more sophisticated levels of IT use. Their past experiences with IT may have been positive or

negative and will have an influence over their beliefs about the future use of IT. In this paper it is proposed that the past experience in relation to IT will influence beliefs (future anticipated competitive advantage) and that both these factors will influence intention to adopt the Internet or the extent to which the Internet is used.

Beliefs held prior to adoption change once the technology is used as the consequences of a behaviour are interpreted and internalized. Therefore, it is crucial to distinguish between pre-adoption and post-adoption (continued use) beliefs and attitudes (Karahanna et al, 1999). In their research on pre and post-adopters of Windows, Karahanna et al (1999:189) proposed that ‘the attitude-behaviour link for users of an IT will be stronger than for potential adopters of IT’. They found that attitudes based on direct experience (users) are more likely to predict behaviour than those based on indirect experience (potential adopters). Those with direct experience are more likely to find it easier to form an attitude. Moreover, the experience will be more readily accessible in memory, which may result in a stronger attitude-behavioural relationship. This paper will also test this hypothesis.

Conceptual model

It is hypothesized that Internet adoption is influenced by two factors that relate to recognition of competitive advantage. Firstly, the benefits experienced by firms from past use of IT will influence both the likelihood and the degree of Internet use. In this study, the IT benefits include improvements in productivity (Palvia, 1997; Fuller 1996) and efficiency (Palvia, 1996; Harrison et al, 1997), improved customer service (Formichelli, 1997; Harrison et al, 1997), and sales growth (Fuller, 1996). Secondly, it is hypothesized that Internet use is influenced by the expectation of future Internet-based competitive advantages (IBCA) in terms of maintaining market share, overtaking competitors, and defending against larger competitors (Friedman, 1996). It is also hypothesized that experiencing IT benefits in the past will increase the likelihood of perceiving future IBCA from the Internet. The proposed models are shown in Figures 1 and 2.

Figure 1 Model of factors affecting likelihood of Internet use

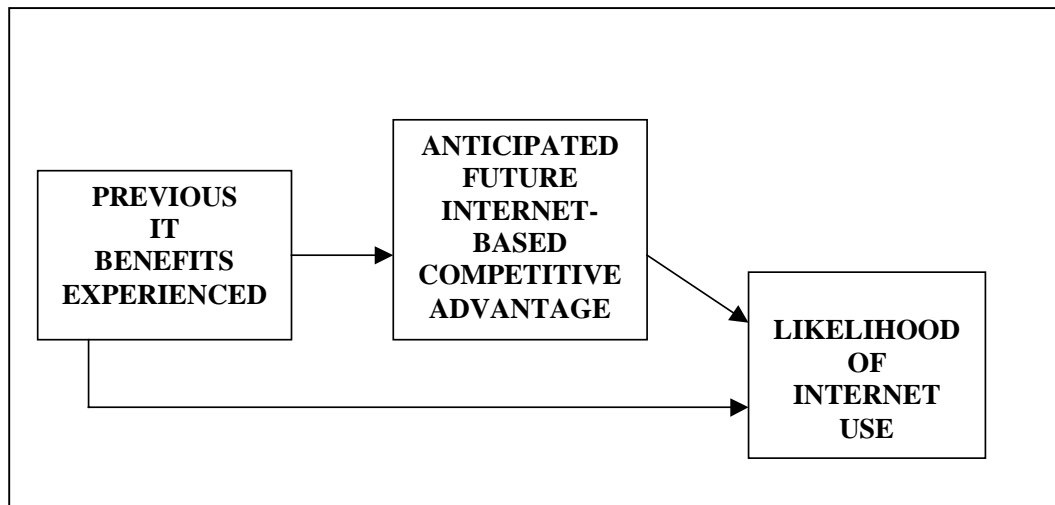
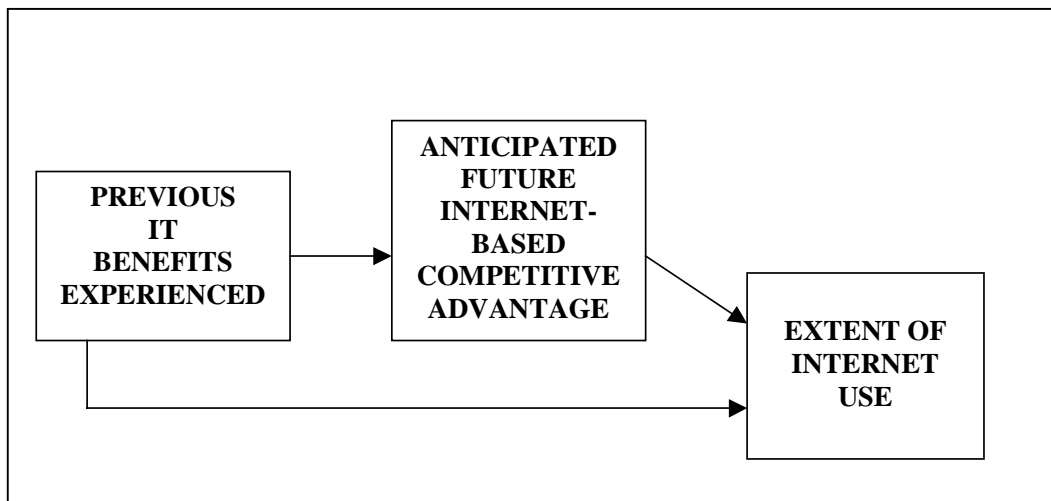


Figure 2 Model of factors affecting extent of current Internet use



The specific hypotheses tested are as follows:

Hypothesis 1: The *extent of Internet usage* is a function of both *previous IT benefits experienced* and *anticipated future IBCA*.

Hypothesis 2: For those who are not currently using the Internet, the *likelihood of Internet use* in the next twelve months is a function of both *previous IT benefits experienced* and *anticipated future IBCA*

Hypothesis 3: *Anticipated future IBCA* is a function of *previous IT benefits experienced*.

Hypothesis 4: The relationship between *anticipated future IBCA* and behavioural intention will be stronger for users than for potential adopters of the Internet.

RESEARCH METHODOLOGY

The sample

Data collection was undertaken by a state-wide survey of 750 pharmacies that operate as small businesses within Queensland, Australia. All members of the Queensland Pharmacy Guild were sent a highly structured, self-administered questionnaire with their Guild's professional journal. Five point Likert-type scales were used with questions relating to past IT experiences, perceived consumer demands for Internet services, anticipated competitiveness with the Internet, current use of the Internet and likelihood of use within the next twelve months. Twenty-four percent of the questionnaires (177) were completed and returned in a postage paid return addressed envelope provided. This rate of return is within the acceptable range for business research (Neumann, 1994). The final sample consisted of 98 potential adopters and 75 users after some observations were dropped as a result of missing data. Demographic data is presented in Table 1.

Table 1 Sample Demographics

| | Potential Adopters | | Users | |
|----------------------------|--------------------|---------------|-----------|---------------|
| | Mode | | Mode | |
| Age | 41-50 yrs | | 31-40 yrs | |
| | Mean | Std Deviation | Mean | Std Deviation |
| Length of time in business | 14.7 | 11.92 | 11.93 | 9.52 |
| | Potential Adopters | | Users | |
| Gender | | | | |
| Female | 27.6% | | 18.3% | |
| Male | 72.4% | | 81.7% | |

The variables

Past IT benefits experienced. Benefits experienced with the use of IT were measured using eight items derived from previous studies (Harrison et al, 1997; Palvia, 1996; Fuller; 1996; Stedman, 1997). For each item, pharmacists were asked to respond to a five point Likert-type scale

ranging from (1) *not at all* to (5) *to a great extent*. These items of past IT benefits experienced related to less time spent in dispensing, greater accuracy, increased profits, competitive advantage, better service for customers, greater ease of use in information systems, sales growth and increased productivity.

Anticipated future Internet-based competitive advantage (IBCA). This variable is a general measure of how future technology will allow pharmacists to compete using three items based on a previous study (Friedman, 1996). Respondents used the same five point Likert-type scale as above to rate these items, which related to maintaining market share, overtaking competitors, and defending against larger competitors.

The internal consistency of these two variables was examined for reliability and showed that the measures are robust with alphas greater than .80 (Nunnally 1978). Table 2 shows the reliability and factor analysis for the study. The correlations between the variables (.48) were much lower than the composite reliabilities, indicating that the two variables have adequate discriminant validity.

| Construct* | Cronbach's Alpha | |
|-------------------------------------------------------------|--------------------|-------|
| | Potential Adopters | Users |
| Past IT benefits experienced (8) | .85 | .87 |
| Anticipated future Internet-based competitive advantage (3) | .93 | .89 |

*The numbers in parenthesis show the number of items in the scale

Extent of Internet use and Likelihood of Internet use. Pharmacists were asked to indicate on a five point Likert-type scale, the extent of their current Internet usage ranging from (1) *not at all* to (5) *to a great extent*. Those who were not currently using the Internet were asked to indicate on the same five point Likert-type scale as above, the extent to which they were likely to use the Internet in the next twelve months.

Additional information was sought from pharmacists to explore their perceptions of how the Internet will be used. Pharmacists were asked to indicate

- The extent to which consumers will use the Internet to directly access information about prescription products

- The likelihood of their pharmacy offering mail-order products
- The importance of having electronic access to prescription histories.

Results

Structural equation modelling using EQS was used to confirm the utility of the model describing the relationships between *past IT benefits experienced*, *anticipated future Internet-related competitive advantage* and *likelihood of Internet use* (Model 1) or *extent of Internet use* (Model 2). To test the efficacy of the models, chi-square tests, goodness-of-fit test indices, the distributions of residuals, and the Lagrange multiplier and Wald tests were used. The chi square values and the comparative fit index for the proposed models are presented in Table 1. They suggest that the proposed models are a good fit. The distribution of residuals is symmetric and the standardised off diagonals are low. The Lagrange multiplier test and the Wald test suggest that no paths should be added or dropped (Table 1).

Table 1 – EQS statistical summary

| |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Model 1 – Actual Internet usage model Chi square = 58.897 3df prob =0.00 Bentler-Bonett normed fit index = 1.00 Average off-diagonal absolute standardized residuals = 0.00</p> |
| <p>Model 2 – Expected Internet adoption model Chi square = 43.901 3df prob =0.00 Bentler-Bonett normed fit index = 1.00 Average off-diagonal absolute standardized residuals = 0.00</p> |

The models with path coefficients are presented in Figures 3 and 4.

Figure 3 EQS model of factors affecting likelihood of Internet use

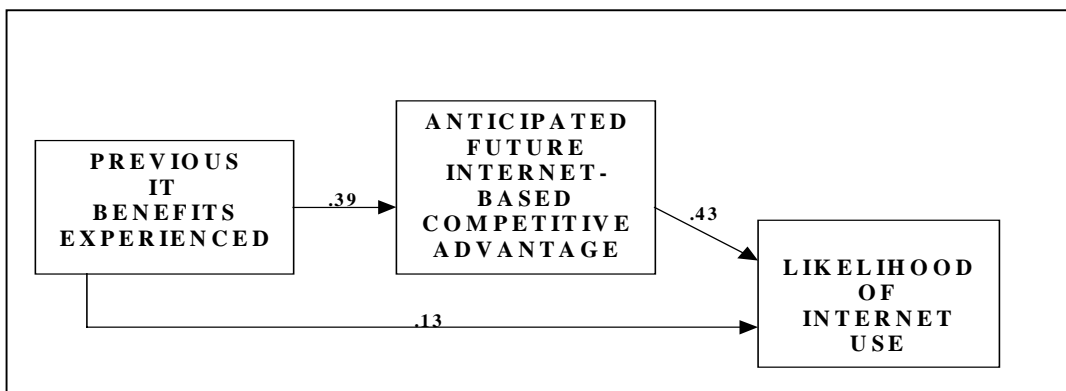
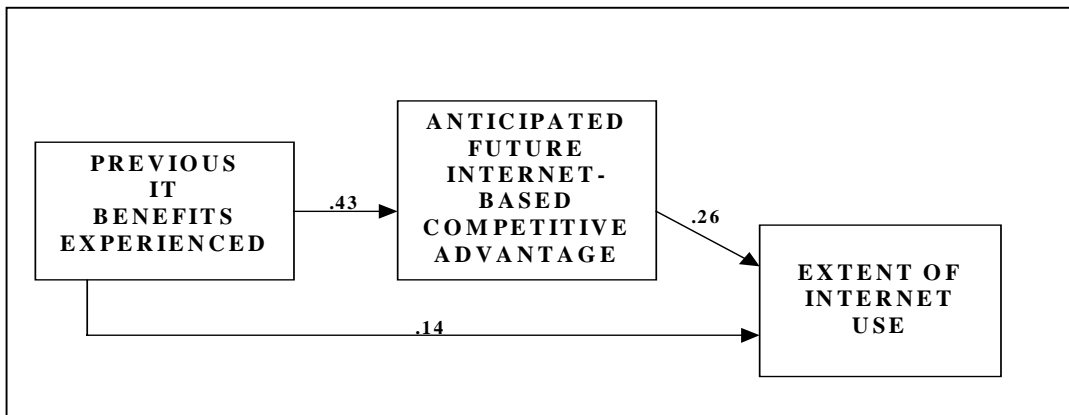


Figure 4 EQS model of factors affecting extent of current Internet use



The EQS models (Figures 3 and 4) provide support for hypotheses 1, 2 and 3. *The likelihood of Internet use* for potential adopters and the *extent of Internet use* for users is affected directly by both *past IT benefits experienced* and *anticipated future IBCA*.

In the model, the major factor affecting Internet usage and likelihood of use is *anticipated future IBCA*. This variable was measured in terms of the ability of small firms to compete by maintaining market share, overtaking competitors and defending against larger competitors. The strategies that would give this competitive advantage were explored through the specific information obtained concerning improved customer service through the use of the Internet.

It was hypothesised that anticipated future IBCA and behavioural intention will be stronger for users than for potential adopters of the Internet (Hypothesis 4). Comparing the beta weights in models 3 and 4, there appears a stronger relationship between the anticipated future IBCA of potential adopters and likelihood of Internet use (.43) than between the anticipated future IBCA of users and the extent of Internet use (.26). However, because of small sample size, this relationship would need to be further investigated to study cause effect relationships using a longitudinal study with a larger sample size.

Preliminary analysis of the additional information relating to pharmacists' perceptions of how the Internet will improve customer service shows that those who are currently using the Internet more intensively expect that their customers will use the Internet to access prescription

information and for mail order purchases. However, they do not consider that provision of full prescription histories is a high customer requirement.

Discussion and conclusions

IT has now permeated 82% of small business (Yellow Pages Small Business Index, 1999) using applications ranging from off-the-shelf computerised accounting packages through to sophisticated IT systems linking them into electronic networks. This study found that earlier experiences of IT influenced the acceptance and use of new IT developments such as the Internet. It also found that there was a relationship between the extent of past benefits gained from the use of IT and attitudes towards anticipated future IBCA. In addition, anticipated competitive benefits to be gained from the use of the Internet were seen to be an important force driving its adoption and level of usage.

As discussed previously, pharmacists face strong competition from supermarket chains for non-prescription items. The threat of deregulation, which would allow supermarkets to sell prescription drugs, is a further incentive to find sources of competitive advantage. For pharmacists, as for many small businesses, personalised customer service is one of the most effective differentiating factors allowing them to compete with larger organisations offering lower prices. The Internet can provide timely, up-to-the-minute information on medicines and other pharmaceuticals that allows pharmacist to provide superior patient care. In addition, the threat from virtual pharmacists in the distribution of drugs is an incentive for community pharmacist to offer e-commerce themselves.

This study shows past IT benefits experienced is a significant determinant of adoption for potential adopters and also a significant determinant of level of Internet usage for users. Therefore, those pharmacists who have previous *positive* experiences with IT are more prepared to invest in and extend their use of new IT such as the Internet. The implications of these findings are that the initial exposure to IT is a crucial factor in subsequent technology acceptance and usage behaviour. A major concern would be that those potential Internet adopters who had negative previous experiences with IT would be slower to adopt the newer technology, or may refuse to use it, and fall behind their competitors even further. Therefore it is important that small firms be provided with the support and information necessary to improve the chances of positive outcomes.

In particular, industry stakeholders such as professional associations and the Government need to ensure that these firms are given the training, information and support necessary to optimise their chances of success.

Past experience also impacts on Internet usage through its effect on anticipated future IBCA. The results of this study on pharmacists suggest that the past benefits gained from IT usage such as increased efficiency, higher productivity, better customer service or sales growth, will increase their belief that the Internet will improve their competitive advantage. For both potential adopters of the Internet and users, the anticipated future IBCA has a stronger direct effect on behavioural intent than previous IT benefits experienced.

In this study, the hypothesis that the relationship between belief that the Internet would provide competitive advantage and behavioural intention would be stronger for users of the Internet than potential adopters was not supported. This result differs from those of Karahanna and her colleagues (1999), but it does fit in with the view of Triandis (1971) who proposes that the link between attitude and behaviour weakens as individuals become more experienced. However, this study investigated two separate groups of potential adopters and users rather than the same group. Therefore further studies would be necessary to track the same sample in a longitudinal study to test changes in strength of the relationship between attitude and behavioural intent over time.

This paper is the first stage of a more comprehensive study that will explore factors affecting Internet usage. Other variables likely to affect usage directly such as organisational readiness and individual characteristics will be examined in future research.

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