Perceptual Influences on Use of Fixed Lines and Mobile Phones

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Abstract – **Notwithstanding the increase in uptake of mobile phones in Australia, fixed line phones remain in extensive use. The Australian population is one of the highest users of fixed line phones in the world. A model for uptake and usage of established technology, and in particular fixed lines is proposed in the absence of any models appropriate to this domain. The model also explores the contribution of a new predictor variable that we propose, Subjective Newness, towards the continued use of technology. Broadly, the results show several reasons why consumers prefer to use fixed line rather than mobile phones.**

I. INTRODUCTION

We investigate how consumer attitudes influence usage patterns and predict future trends in the uptake of telecommunication technologies, in particular fixed line[1] and mobile phones. A related question is to what extent these two telecommunication devices are complimentary or competing technologies? The prevailing view is that fixed line phones are an 'old' technology, whilst the mobile phone is the 'new' telephony technology, thus the future of the fixed line phone is questionable with the mobile phone seen as a natural replacement. Some mobile phone carriers (e.g., Vodafone, Optus, Virgin) are predicting a large downturn in fixed line usage [1]. However, fixed line phones are still being used at rates higher than this viewpoint predicts. In comparison to the rest of the world, Australians are still high users of fixed line phones. In order to assess the future of fixed lines, we need to examine behavioural models of acceptance.

Most technology acceptance models focus on acceptance and usage of **new** technology. We found no technology acceptance models designed to make predictions about the usage of older or established technology such as fixed lines. Our research therefore is an attempt to fill this conceptual gap and develop a model which can be used to predict the usage of established technology. We chose the well-known Technology Acceptance Model TAM [2] as the base to our model and incorporated further predictor variables of technology adoption and usage relevant to fixed lines. In order to evaluate the model's ability to predict new as well as established technology, we compared the model's performance for fixed and mobile phones. This provided us with the opportunity to directly compare customer perceptions of fixed-lines versus mobiles.

The current model incorporates two constructs predicting attitudes in TAM, perceived usefulness (PU) and perceived ease of use (PEOU) and additional variables, Subjective Newness (SN), Trust, Perceived Cost (PC) and Self Report Use (SRU) (see Figure 1).

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[1] The term 'fixed-line' in this paper refers to traditional PSTN telephones found in most Australian houses.
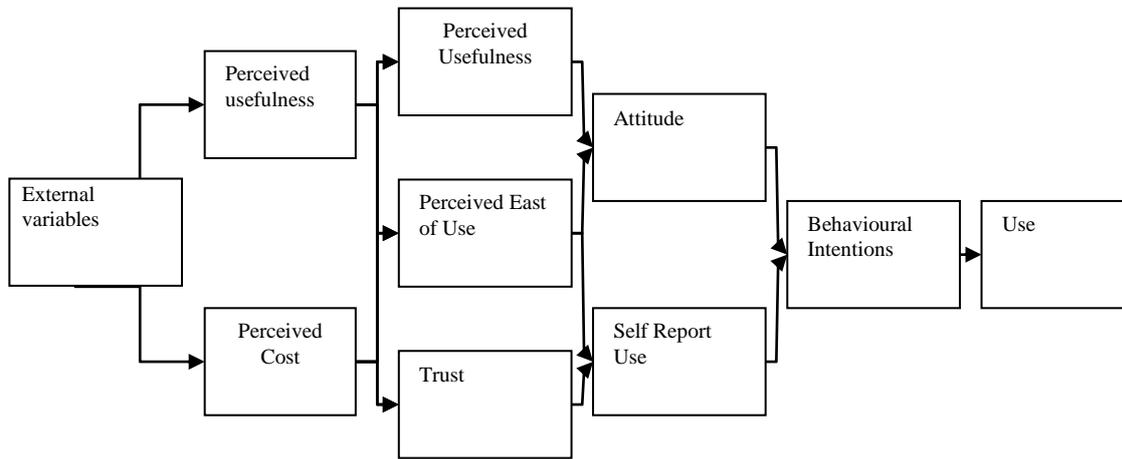
Figure 1. Proposed model of technology usage adapted from TAM, to include trust, perceived newness, perceived cost and self report use.

We propose that knowledge, familiarity and experience with a technological device have a large impact on the usage of that device. That is, most consumers choose technology they know well and feel that they are able to use with minimal effort. The combination of the three factors – knowledge, familiarity and usage – for the purpose of this research is termed Subjective Newness (SN). For the technology to become 'un- new' (to have less subjective newness) in the consumer's eyes, the person needs to have extensive knowledge and familiarity with the device and be able to use it in a near automatic fashion (automatic behaviour is a process that takes place largely independently of conscious control and of attention) [3]. That is, no or very little cognitive effort is required to use the technology.

Trust has been found to be an important factor in studies of technology acceptance [e.g. 4]), so we included it in our model. Perceived Cost (PC) was included as an internal variable based on anecdotal evidence and market research reporting that Australian consumers perceive mobile phones as being more expensive than fixed line phones. Other external variables studied in this research are gender, age and household income. Gender and age have been shown to be factors in technology uptake and usage in a number of studies [e.g. 8] while income has been implicated as a secondary predictor of product use [e.g. 9]. Finally, self report use was included to investigate the relationship between the current usage of the telecommunication devices and future intentions to use.

In addition to testing the model's ability to predict behavioural intentions to use fixed lines, the following predictions were also made. It was predicted that:

- people will report a higher level of experience and familiarity (SN) with fixed line phones than mobile phones because fixed line phones have been in use for a longer period of time and have remained relatively unchanged during this time;
- Perceived Ease of Use (PEOU) will be higher for fixed lines - in particular because PEOU is estimated to be influenced by Subjective Newness (SN). That is, the lower Subjective Newness (SN) the higher expected Perceived Ease of Use (PEOU) – the familiarity and experience leads to a perception of higher perceived ease of use;
- Perceived Usefulness (PU) will be higher for mobile phones due to the mobile lifestyle of many Australians.

To test the current model and the predictions made above, a survey of attitudes held by Australian consumers towards fixed line phones and mobile phones was carried out. The survey involved a questionnaire which was distributed on–line to a large group of businesses and private consumers.

II. PROCEDURE

A. Sample

A sample was derived from The Launceston Broadband Project sample which has 2000 households and business members (approximately 1600 households and 400 businesses) provided by Telstra Corporation Limited. A total of 916 questionnaires were returned (50% response rate). One case was identified by fox plots as an extreme outlier and deleted from the final analysis. Eleven cases were deleted from the analysis due to substantial missing answers. Age of the participants ranged from 18 to 78 years of age with the mean being 44.0 years. The sample contained 664 males (73.5%) and 240 females (26.5%). Eight hundred and twenty five respondents owned a mobile phone (91.3%) and 878 (97.1%) had a fixed line phone at home.

B. Procedure and Method

All participants were sent an email with an attached on-line version of the questionnaire. A reminder e-mail was sent 3 weeks after the initial email. All questionnaires were completed and submitted on-line. The questionnaire was designed to measure each variable in the model (see Figure 1); the answers were provided on a 7-point Likert scale**.**

III. RESULTS

Hierarchical regression analysis was employed to evaluate our proposed model (see Figure 1), specifically, the model's ability to predict behavioural intentions to use fixed lines. We inserted each of the components of the model into the regression analysis, in the order and association reflected in Figure 1. The overall four-step model we propose accounted for 45% of the variance associated with predicting fixed line use. The effects were statistically different from zero in all four steps of the model: Step 1, $F(3, 893) = 26.76$, $p < .000$; Step 2, $F(5, 891) = 36.89$, $p < .000$; Step 3, $F(8, 888) = 39.62$, $p < .000$; Step 4, $F(10, 886) = 72.35$, $p < .000$, indicating that the model successfully predicted fixed line use, at each component of the model. The effect sizes were large indicating that our model was a strong predictor of behavioural intentions to use fixed lines. The external variables (i.e., gender, age and household income) accounted for 0.8% of the variance.. The only significant results were that (1) females had higher intentions to use fixed lines than males, and (2) increase in age predicted higher use. The results of the hierarchical regression suggested that our proposed model could provide more predictive power if re-ordered; those changes give us the model shown in Figure three below.
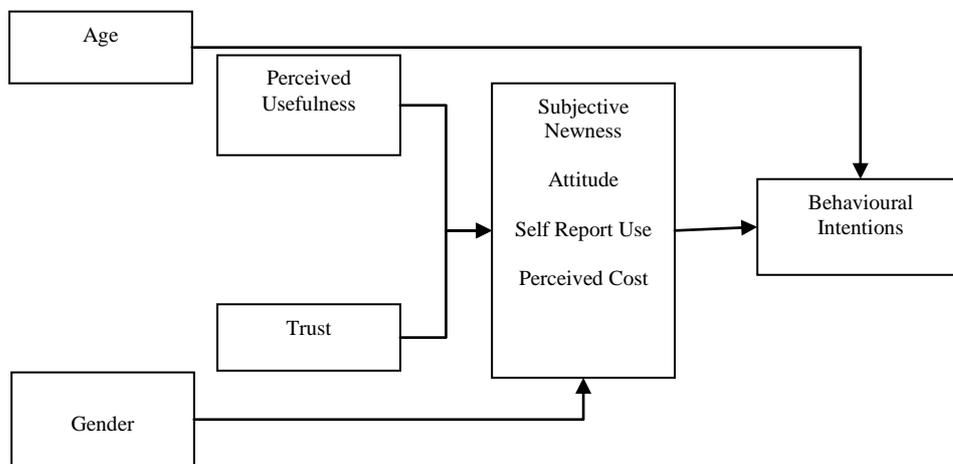

Figure 3. Fixed line usage model (PLUM).

A second hierarchical regression analysis was carried out to predict behavioural intentions towards **mobile phones**, containing the same independent variables as in the first regression analysis except pertaining to mobile rather than fixed line phones. The four-step overall model accounted for 65% of the variance associated with predicting mobile phone use. The effects were statistically different from zero in all four steps of the model: Step 1, $F(3, 893) = 19.94$, $p < .000$; Step 2, $F(5, 891) = 48.15$,

$p < .000$; Step 3, $F(8, 888) = 118.54$, $p < .000$; Step 4, $F(10, 886) = 164.72$, $p < .000$. The effect size (65%) is considered large, indicating that our model also predicted behavioural intentions to use for 'new' technology. From the detailed results the statistically-suggested model for mobile phone acceptance is presented in Figure 2 below.
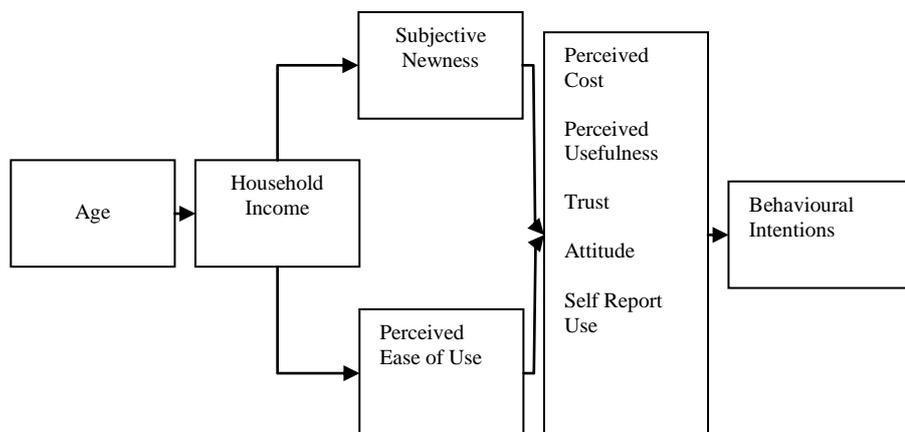

Figure 2. Mobile phone usage model (MPUM).

IV. DISCUSSION

The results of this study suggest that although there is a statistically significant difference between Behavioural Intentions for mobile and fixed line phones, examination of the means reveals that this difference is not large. Most importantly, behavioural intentions towards fixed lines are influenced by different factors from those towards mobile phones. Only PC, SRU and Attitudes were variables directly influencing behavioural intentions toward **both** fixed lines and mobile phones. The results confirm that people perceived fixed lines as the cheaper technology and that this perception strongly influenced behavioural intentions, negatively in the case of mobile phones and positively in the case of fixed lines – that is, consumers are more likely to use fixed line phones in preference to mobiles because they believe that they are cheaper.

Results also confirmed that existing use encourages future use of that device. This may be due to the fact that users become attached to the device that they are using. . In addition, having the feeling of 'liking' the device also predicted intentions of use in the future. This result supports that reported on 'attitude' towards a technology, where a user's attitude (or liking) is one of the strongest predictors of technology acceptance [insert reference to my Meta-analysis paper – see me for the reference] Trust was an important predictor for mobile phones, which is consistent with the view that new technology needs to 'earn' trust. Interestingly, trust did not directly predict intentions to use fixed lines, possibly because trust was so consistently high for that technology given that it is so established. ** in the results, we should have done a comparison of trust for fixed vs mobile to make this comment.

Results confirm that Subjective Newness (SN) was an important variable in the prediction of fixed line use, and should be adopted as a component of any acceptance model focused on existing rather than new technology. Subjective Newness was found to be less important in predicting acceptance of 'new' technology, so is not as important to include in any models focused on new technology, such as the TAM is aimed at .

Perceived Usefulness (PU) was not a direct predictor of the use of fixed lines, suggesting that fixed lines are not viewed in terms of how useful they are to users. It might be argued that fixed lines are viewed more like a household item or an 'apliance', rather than a technology. Furthermore, in the case of fixed lines, gender and trust were significant predictors only in the early

steps of regression, once in the final step, they 'fell out', with subjective newness becoming the primary predictor of use. This is consistent with our earlier predictions that SN plays a vital role in predicting the future use of **existing** technologies. It suggests that once people are familiar, experienced and have used the technology for an extended period of time, trust becomes a relatively minor issue. These results also suggests that gender differences in the usage of existing technologies may be 'artificial' and depend on the SN, that is, females may take longer to reach low levels of SN than do males, suggesting that future research should be focused on levels of SN rather than exploring gender differences. In summary, the factors that suggest that fixed lines will remain a popularly-used technology are: the low level of SN, the perception that fixed lines are cheaper than mobiles, current high levels of use and the positive attitude towards the technology. The results may be interpreted in the light of fixed lines being perceived as a household item rather than an item of technology. In addition to the above, age was also a primary predictor of fixed lines, that is, with increased age, intentions to use fixed lines also increased. Multiple explanations are available here: The age effect may be due to (1) the more mobile or 'nomadic' life style of younger people relative to the elderly (** we may want to insert a reference here, such as Christine Satchwell's work, or Stephen Wearing's work – see me for a ref), (2) older consumers have had more experience with fixed lines than mobiles, which may extend to a lack of understanding or familiarity with alternate communications devices such as mobiles. Further research is required to validate either explanation.

As predicted, results strongly support the view that people perceive new and existing technologies differently and that this difference has a strong influence on the intentions to use the technology. Therefore, there are no existing models of technology acceptance that can be applied to existing technolpogies, as all are focused on 'new' technologies. Our model which has been proposed here and improved through statistical analysis should be used in preference to other existing technology acceptance models where the focus is on existing technology. In order to promote continued use of existing technologies, our results suggest that an approach different to that employed for new technologies should be adopted. Further, that there are several statistically significant reasons why consumers prefer to use fixed rather than mobile phones, suggesting that this technology will play an important role in the telecommunications framework in Australia for some years to come. In order to continue the high levels of use for fixed line phones, the focus should primarily be on increasing consumers': subjective newness and positive attitude for the technology, while maintaining the current high-levels of use (so as to promote future use through familiarity).

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