2006

Examining a Model of On-Line Auction Adoption: A Cross-Country Study

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Abstract

There has been tremendous growth in on-line auction activities over the last several years. However, what makes consumers adopt and use on-line auction has not been researched deeply using a specific framework. There is also lack of cross country study of the adoption behaviour of on-line auction. This paper aims to fill this gap. Based on extensive literature review on academic and commercial papers/reports/websites, we develop a comprehensive on-line adoption model along the framework of Theory of Planned Behaviour (TPB) and Innovation Diffusion Theory. The model is empirically tested by using Partial Least Square (PLS) based structural equation modelling approach in Australia and China. The primary data was collected via questionnaire based survey in Australia and China. The results of Australian Study show that subject norm, attitude and trust have significant impact on the buying intention via on-line auction, while personal innovativeness and behavioural control haven't. The results of Chinese Study indicate that subject norm, personal innovativeness and behavioural control have significant impact on the buying intention via on-line auction but attitude and trust haven't. Implications of the results are discussed.

Keywords: On-line auction, Adoption/Diffusion, Structural Equation Modelling (SEM), Partial Least Square (PLS), Cross-Country study

1. Introduction

Electronic Commerce (EC) is changing the way organizations perform their tasks, interact with customers and, in general, do their business. Among the many activities of EC e-shopping/e-purchasing has seen tremendous growth in the past several years. One of the many ways customers can purchase over the net is via online auction. Online auction sites are essentially the "market places" where customers (consumers, businesses and other types of purchasers) can participate in on line bidding for a product over a specified period of time following a particular auction model (rule) (Wang et al. 2002, Lucking-Reiley 2000). Lucking-Reiley (2000) states that billions of dollars are already being transacted in online auction and it is growing at the rate of 10% per month. A number of auction sites have appeared in Australia and China in the last few years. Some examples of online auction sites in Australia are: Sydney Auction (http://www.sydneyauction.net), Graysonline Australia (http://www.graysonline.com.au/), Stuff Marketplace (http://www.stuff.com.au/), eBay Australia (http://www.ebay.com.au/), E Bid Australia (http://www.ebid.com.au/), Ozetrader Online Auctions (http://www.ozetrader.com.au/), among many others. Some Chinese Auctions sites are:1pai Auction (http://1pai.com.cn), eBay China (www.ebay.com.cn), YaBuy.com (www.yabuy.com), Guaweb (www.guaweb.com), China Auction Net (www.a123.com.cn), among many others.

On line auction is a modern innovation and offers shoppers an opportunity to buy products at a competitive price. It is sometime preferable to traditional mode of online buying as customer feel that he/she is controlling the price of the product. The spectrum of online auction has spread from the developed to developing countries. However, despite its tremendous growth and coverage in public and the popular press (Lucking-Reiley 2000) deep research on the adoption of online auction using a particular framework is somewhat limited. There is also a need to study and compare the on-line auction adoption behaviour across various countries. This will help on-line auction providers to customize their auction sites appropriately. This research aims to contribute in this aspect by choosing Australia and China as the countries to compare the antecedent factors of online auction. Primary aims of this research are therefore

1. *To identify attitudinal, social, and behavioural factors of consumers that are significant in explaining the intentions of buying products via online auction.*
2. *To examine how these factors differ in Australia and China*

The paper is organized as follows. The next section presents a brief background to on-line auction literature. Our research model is then presented which has been developed based on extensive literature review on both academic and commercial papers/reports/websites. The hypotheses are also presented in this section. The target sample, measures and the data analysis method, based on partial least square, are presented in research method section. The findings are next presented. Finally, the paper concludes with the discussion and implications of the results.

2. Background

Literature on on-line auction is dominated by case studies and pros/success and cons/failures of online auction.

For example, Gilkeson and Reynolds (2003) study various factors influencing auction success and closing price. The authors found that reserve price, opening price and number of bids have significant impact on auction success and the closing price. Van Heck and Vervest (1998) pose the question 'are auctions beneficial for all companies?' The authors identify a number of advantages for both sellers and buyers of on-line auction. The dominant ones are reduction in transaction costs, increase in potential customers, and improvement in search-and-find capabilities for all parties. In an interesting study Beam et al. (1999) explore the problem of 'deal' making in e-commerce and on-line auction. Other literature dealing with pros and cons of on-line auction in various contexts include Bakos (1998), Ku and Malhotra (2001), Vaculik (2003), Kamins et al. (2004), Gilkeson and Reynolds (2003), McDonald and Slawson (2002), Jap (2002) (reverse auction), Emiliani and Stec (2002) (reverse auction), Lucking-Reiley (2000), Wang et al. (2000), among many others.

A number of other studies deal with various aspects of online auction, including field studies (e.g., Beam & Segev 1998), implementation (e.g., Neo 1992), assessment of online auction (e.g., Turban 1997), specific auction models (e.g., Heezen & Baets 1996, Lee 1997, Segev and Beam 1998), dispute resolution for online auction (e.g., Lansing & Hubbard 2002), analysis and design of online auction (Bapna et al. 2002; Bapna et al. 2003), efficiency of online auction (e.g., Bapna et al. 2001), the impact of social facilitation on online auction (e.g., Rafaeli & Noy 2002), trust in online auction (e.g., Ba & Pavlou 2002, Ba et al. 2003),

price issue of online auction (e.g., John et al. 2002, Budish & Takeyama 2001), among many others.

However, as mentioned before the literature did not reveal any specialised application of modelling framework to study the adoption phenomenon of on-line auction. Our present study fills this gap by developing and applying an auction adoption model in Australia and China.

3. On-Line Adoption Research Model

Figure-1 shows the on-line auction adoption research model which is based on two underlying theories, i.e. 'theory of planned behaviour' (TPB) (Ajzen 1991) and 'diffusion theory' (Rogers 1983). In short the TPB emphasizes that adoption of any phenomenon takes place through a series of deliberate planned decisions. On the other hand the 'diffusion theory' says that there are a number of consequences which help in deciding to adopt and subsequently use the phenomenon in question. It is noted that our research model has been extended based on the literature reviewed earlier. The constructs "BuyIntent_P7", "SNorm_P5", "Attitude_P4" and "BControl_P2" have been adapted from TPB (Ajzen 1991), whereas the construct "Conseq_P3" has been adapted from diffusion theory (Rogers 1995). As trust and personal innovativeness play dominant roles in overall E-commerce the construct "Trust_P1" has been adapted from Ba and Pavlou (2002) and Ba et al. (2003) and the construct "Innov_P6" has been adapted from Limayem et al. (2000).

[Insert Figure-1]

3.1 Hypotheses

The links among the factors in Figure-1 represent various hypotheses. However we have categorized the hypotheses as being primary and secondary as follows.

Since intention to buy via on-line auction is the ultimate dependent factor any hypothesis relating "BuyIntent_P7" is termed as primary hypothesis (Figure 1). Behavioural intention (buying intention via on-line auction in our case) is the ultimate dependent factor in any TPB based application (Ajzen 1991). TPB has been applied in various adoption intention behaviour (Berger 1993, Ajzen and Driver 1992, Madden, Ellen and Azjen 1992, Cheung, Chan and Wong 1999, Randall and Gibson 1991). TPB has also been applied in farm management. Beedell and Rehman (1999, 2000) have applied TPB in understanding farmers' behaviour of managing wildlife and landscape features. These applications however do not deal with adoption phenomenon. In all these applications subject norm, attitude and behaviour control have been hypothesized to influence the behavioural intention of the specific application. In line with these empirical studies and using the underlying theory of planned behaviour (Ajzen 1991) we also hypothesize the relationship of subject norm, attitude and behavioural control with buying intention via on-line auction.

In a related study Limayen et al. (2000) found personal innovativeness to impact consumers' intention to do on-line shopping via internet. In line with this study we argue that one needs to be innovative to buy goods via on-line auction. We thus hypothesize the relationship of personal innovativeness with buying intention via on-line auction. Trust also plays significant role in any transaction via internet (Ba and Pavlou 2002, Ba et al. 2003, Gefen et al. 2000). Trust is thus an equally important factor of buying via on-line auction. In line with these studies we also hypothesize the relationship of trust with buying intention via on-line auction.

The following five primary hypotheses are thus formulated:

H1:   There is a positive relationship between Subject Norm and Buying Intention
H2:   There is a positive relationship between Personal Innovativeness and Buying Intention
H3:   There is a positive relationship between Attitude and Buying Intention
H4:   There is a positive relationship between Trust and Buying Intention
H5:   There is a positive relationship between Behavioural Control and Buying Intention

The secondary hypotheses are the hypotheses which link other factors of Figure 1 except "BuyIntent_P7".

As mentioned earlier trust is an important factor in any form of transaction via internet. However, trust is also likely to play significant role in influencing behavioural control, attitude and consequences of buying via on-line auction (Ba and Pavlou 2002, Ba et al. 2003, Gefen et al. 2000). As mentioned earlier the TPB covers both internal and external behavioural controls. Trust is likely to influence one's internal behaviour control. Higher level of trust in on-line auction will increase one's internal confidence in his/her ability to influence the behaviour (Triandis 1980).

The consequence construct of Figure 1 has been developed based on diffusion theory (Rogers 1995). Basically it deals with a range of advantages and disadvantages of buying via on-line auction. Higher level of trust with on-line auction is likely to have positive impact on perceived consequences of buying via on-line auction (Liyayem et al. 2000, Ba et al. 2003).
The attitude construct is one of the main constructs of TPB (Ajzen 1991). In our case it represents attitude toward on-line auction. In TPB attitude construct is influenced by various beliefs (Ajzen 1991). In our case we thus surmise that attitude will be influenced by personal innovativeness (Liyayem et al. 2000), perceived consequences (Liyayem et al. 2000, Lucking-Reiley 2000) and trust (Ba and Pavlou 2002, Ba et al. 2003).

As per above discussion following five secondary hypotheses are formulated:

H6:   There is a positive relationship between Trust and Behavioural Control
H7:   There is a positive relationship between Trust and Attitude
H8:   There is a positive relationship between Trust and Consequences
H9:   There is a positive relationship between Consequences and Attitude
H10:   There is a positive relationship between Personal Innovativeness and Attitude

4. Research Method
4.1 Measures
The seven constructs (factors) described earlier (see Figure-1) have been measured with great care. Seven point likert scale ranging from 'strongly disagree' to 'strongly agree' has been used in all the items. The reliability and validity have been assessed based on the standard procedure of Partial Least Square (PLS) technique (Chin 1998, Chin & Newsted 1999, http://www.plsgraph.com). Most of the items have been adapted from the existing literature as follows.
Trust. This construct measured respondent's trust with on-line auction system. Nine items were used to measure this construct. 8 of them were adapted from Ba and Pavlou (2002), Pavlou (2002) and Gefen et al. (2003). One measure was developed from ACCC (2000).

Behavioural Control. This construct measured a person's beliefs about the internal and external resources and opportunities at his/her disposal that are required to control/facilitate various aspects of on-line auction. Seventeen items were used to measure this construct. 16 of them were adapted from Ba and Pavlou (2002), Pavlou (2002), Limayem et al. (2000), Lucking-Reiley (2000), and Ba et al. (2003). And one measure was developed from ACCC (2000).

Consequences. This construct refers to perceived advantages and disadvantages of on-line auction. The construct was based on Rogers (1995). It had ten items which were adapted from Rogers (1995), Limayem et al. (2000) and Lucking-Reiley (2000).

Attitude. This construct measured a respondent's attitude toward on-line auction. It had seven items which were adapted from Limayem et al. (2000) and Pavlou (2002).

Subject Norm. This construct refers to direct and indirect influences that the respondent is subjected to buy goods and services via on-line auction. It had four items which were adapted from Limayem et al. (2000) and Pavlou (2002).

Personal Innovativeness. This construct measured how innovative a respondent is to try new things and ideas. It had four items which were adapted from Limayem et al. (2000).

Buying Intention. As the name implies this construct measured the buying intention of a respondent via online auction. It had eight items which were adapted from Gefen et al. (2003), Hartwick and Barki (1994), and Karahanna et al. (1999).

It is noted that all seven constructs of our research model (Figure 1) are reflective in nature (Chin 1998b). The model has a total of 59 items.

4.2 Sample and Procedure

The sample of Australian study was obtained from the students of an MBA program from a University in the eastern state of Australia. Students have been used as subjects in various information system research, for example see Gefen et al. (2000) among many others. Gefen et al (2000) call it "free simulation experiment". Taking part in our simulation experiment was completely voluntary. It was not part of any course assessment. Being MBA students our subjects had wealth of experience in using internet and many had previously purchased via internet and on-line auction. The questionnaire was sent to 100 MBA students. The students were also advised to get exposure to on-line auction system (if they have never used on-line auction before) prior to completing the questionnaire. Prior to that, the complete questionnaire was evaluated by a group of four researchers knowledgeable in e-commerce and on-line auction system. The questionnaire was revised several times to improve its face validity and readability.

71 students returned their responses. 3 of them were not valid responses (missing data etc.). We thus got 68 usable responses (68% response rate). The profiles of the respondents are as follows. 70 % of them are male. 38% are in the age bracket of 21 to 29, 31% in 30 to 39 bracket, 21% in 40 to 49 bracket and 9% are in 50 to 59 age bracket. 25% of the respondents have bachelor's degree, 15% have graduate diploma, 44% have Masters degree and 9% have doctoral degree. 53% of the respondents have annual income of more than A$30000. The respondents are also quite internet literate as 96% of them regularly use internet. However,

only 32% of the respondents used on-line auction system before to buy product and services. Among them the number of products that they bought from on-line auctions varied from a low of 1 (23%) to 15 (14%). However, about 25% of the respondents said their current usage of on-line auction is moderate to high. The most popular products bought from on-line auction are Computers/IT, Cameras, Consumer electronics, Sporting goods, Movies/DVDs, Books/Comics/Magazines in that order.

The research subjects of Chinese study were the students of MBA and BBA programs from a University in the eastern state of Australia. These students are based in China and doing their MBA and BBA degrees offshore in China. Primary data was collected via questionnaire based survey. In the main survey the questionnaire was sent to 140 MBA students and 100 BBA students. 137 students returned their responses. 11 of them were not valid responses due to missing data. We thus got 126 usable responses (52.5% response rate). The profiles of the respondents are as follows. 63.5% of them are female. 19.8% are in the age bracket of 15-20. 56.3% are in 21 to 29 bracket, 22.2% in 30 to 39 bracket, 1.6% in 40 to 49 bracket. 18.3% have completed high school, 10.3% have diploma's degree, 53.2% of the respondents have bachelor's degree, 7.1% have graduate diploma, and 11.1% have Masters degree. 31% of the respondents have annual income of more than RMB 60,000. The respondents are also quite internet literate as 85.7% of them regularly use internet. 43.2% of the respondents used on-line auction system before to buy product and services. Among them the number of products that they bought from on-line auctions varied from a low of 1 (18.5%) to 50 (2%). And 41.2% of the respondents said their current usage of on-line auction is moderate to high. The most popular products bought from on-line auction are Books/Comics/Magazines, Movies & DVDs /Clothing & Accessories/PC& Video Games, Computers & IT, Toys, Hobbies, Crafts, Music & Instruments, Cameras & Accessories, Consumer Electronics, Phones, Sporting Goods, Dolls & Bears in that order.

4.3 Data Examination

Before the data were analysed, it was necessary to assess its properties. The data were tested for assumption of multinormality. Although the Kolomogorov-Smirnov normality test showed the distribution anomalies in all items, the skewness and kurtosis of each item fell within the acceptable range (± 2).

5. Results

5.1 Assessment of Measurement Properties

As per Barclay et al. (1995) item reliability, internal consistency and discriminant validity were used as criteria to make sure that the model has acceptable measurement properties.

The individual item reliability was assessed by examining the loadings of the items. A minimum value of 0.4 was used as criterion to accept the reliability of individual items (Igbaria et al. 1997). Results of the initial model showed that a number of items had loadings less than 0.4 for both Australian and Chinese study. These items were thus dropped from further analyses in order to improve the item reliabilities. Table-1 & Table-2 show the final item loadings for Australian and Chinese studies respectively. T-values of the items were also found to be high, indicating that the items are loaded significantly with their corresponding constructs. It is noted that final reliable set of items stands at 54 for Australia and 51 for China (see Tables 1 and 2).

[Insert Table-1 & Table-2]

Internal consistency of the latent variables was measured following the procedure of Fornell and Larcker (1981). The cut-off point for internal consistency is normally taken as 0.7. Table-

3 and Table-4 show that all the latent variables for both Australian and Chinese studies have internal consistencies above 0.7, indicating that the constructs are internally consistent and hence reliable.

[Insert Table-3 & Table-4]

Discriminant validity of the latent variables was tested using the procedure of Fornell and Larcker (1981). Average variance extracted (AVE) was found for each latent variable. Square roots of AVE were then compared against the correlations among the latent variables (see Table-5 & Table-6). Square roots of the AVEs are shown in the main diagonal of Table-5 & Table-6. The off-diagonal elements are the correlations among the latent variables. For adequate discriminant validity square root of the AVE should be greater than the off-diagonal elements in the corresponding rows and columns (Barclay et al. 1995). Table 5 indicates that there is no validity problem with the Australian study as the diagonal elements are greater than the off diagonal elements. In the process of examining discriminant validity of Chinese study, the value of correlation between Trust construct and Behavioural Control (0.72) just exceeded the square root of AVE of Behavioural control (0.71), which indicates a minor validity problem.

[Insert Table-5 & Table-6]

5.2 The Structural Model and Tests of Hypotheses

Table-7 shows the results of the structural models for Australian and Chinese studies. For Australian study, it is observed that among the primary hypotheses H1, H3, and H4 are supported (significant t-values) while hypotheses H2 and H5 are not supported (insignificant t-values). The model explains 71% of the variance of BuyIntent (see Figure-1 and Table-7). Among the secondary hypotheses H6, H8 - H10 are supported while H7 is not supported. 35.9% of the variance of Attitude and 33.3% of the variance of BControl are explained by the model (see Figure-1 and Table-7).

[Insert Table-7]

For Chinese study it is observed that among the primary hypotheses H1, H2 and H5 are supported (significant t-values) while hypotheses H3 and H4 are not supported (insignificant t-values). The model explains 55% of the variance of BuyIntent (see Figure-1 and Table-7). It is interesting to note that all secondary hypotheses of the China study (H6 - H10) are supported. 40% of the variance of Attitude, 34% of the variance of Consequence and 52% of the variance of Behavioural control are explained by the model (see Figure-1 and Table-7).

6. Discussions

The structural model analysis unearths some interesting findings. Our ultimate goal was to find the antecedents of buying intention via on-line auction (BuyIntent). It is observed that Subject norm (SNorm) is the only direct dominant factor of BuyIntent for both Australian and Chinese studies. Attitude also has significant direct impact on BuyIntention in Australian study. This is in line with previous literature. These two factors have also been found to be significant in overall e-commerce activities.

Subject norm is a combination of various indirect pressures a consumer would be subjected to buy goods and services in on-line auction. Our model postulates that subject norm does not have any antecedents. It works by itself influencing the BuyIntent. On the other hand, 'Attitude', which very strongly influences BuyIntent (in Australian study), has three significant antecedents as Innovativeness, Trust and Consequences. This implies that attitude of a consumer towards buying via on-line auction is formed primarily by his/her perceived innovativeness, trust toward online auction and consequences of buying via on-line auction. It is interesting to note that two are personal, internal and psychological attributes

(innovativeness and trust) and the other is an outcome oriented attribute which depends, among many other things, on 'good' on-line auction site. Table-7 shows that Innovativeness directly influences BuyIntent (H2 supported) in Chinese study. It is interesting to note that high uncertainty avoidance prevails in Chinese culture (Schneider & Barsoux 1995; Chow 1994). Even then our study shows that Chinese people are willing to try new things like online auction. It is also noted that Innovativeness does not directly influence BuyIntent in the Australian study. The possible explanation is the security issue for e-commerce. Security is one of the main inhibiting factors for e-commerce activities all over the world. As a result, even though Australian consumers have low uncertainty avoidance and are more willing to try new things (Schneider & Barsoux 1995; Chow 1994), they are not going to easily adopt online auction as a result of the security problem.

It is observed that in Australian study, Behavioural Control has no significant direct influence on BuyIntent. This is contrary to some earlier studies in similar domains. Behavioural control is an individual's perception of his/her ability to perform a behaviour (Limayem et al. 2000). In on-line auction system the respondents in Australia might feel that they have least or no control at all in many of the activities of on-line auction system even though the Australian government takes the stance that electronic transactions are legally the same as traditional, paper-based transactions. In the China study however Behavioural control has significant impact on Buy Intent.

Among the secondary hypotheses H6, H8 – H10 are supported in both Australian and Chinese studies (see Table-7). H7 is supported in Chinese study but not supported in the Australian study. Overall it is observed that each factor (latent variable) of Figure-1 has either a direct or indirect influence on BuyIntent. Furthermore, Both Australian and Chinese studies have proved the model to be valid as evidenced by the good R square values (55% in China study and 71% in Australian study). However, more research is needed to uncover the impacts of the links which are not supported in our study.

6.1 Practical Implications
The results of this study have significant implications for online auction practices. This research presents a practical model of online auction adoption, which will provide company help in understanding the customers' decision in taking part in online auction in both Australian and Chinese markets. The mediating effects of attitude between customer-related factors (e.g., innovativeness, trust, consequence, etc) and intention to buy suggest that company probably should put more emphasis on shaping and forming the favourable attitude towards online auction. The company's effort of promoting its online auction services might be more fruitful when its attention focuses on the "development" of pro-online auction attitude. Successful adoption will take place if the formation of attitude is properly handled (Agarwal & Prasad 1999). The results that innovativeness and consequence have significant impact on attitude suggest that when a company is dealing with developing customers' attitude toward using online auction, it should provide free trial (let customers themselves see how it works and see the benefits), deliver effective services and target at such market segments where people are willing to take risk and try new things (e.g., people who are young, well-educated, having good income, and very busy).

The results of trust's direct impact on behavioural control in both Australian and Chinese studies suggest that online auction sites should be trustworthy. Online auction websites can achieve it by enhancing its online services, e.g., insurance policy, rating system, clear policy

on anti-trust activities, etc. The more customers can feel the trust, the more confidence they have in participating online auction.

This research also identified subject norm being the only significant factor of buy-intention. To take advantage of this the online auction sites may provide incentives to introduce peer customers, relatives, friends, colleagues and the like to use online auction since influence from others (e.g., word-of-mouth effect) can paly an important role in people's decision in adopting online auction.

7. Conclusions

This research presents a model of online auction adoption. The data from Australian and Chinese students are used to test the model in two different cultural contexts. It is observed that the results of primary hypotheses are quite different for the two countries. But there are some similarities in the results of the secondary hypotheses. More research is needed to understand the differences in results. A formal analysis from cultural perspectives can be undertaken in this regard (Quaddus and Tung 2002).

This research has a number of limitations and thus a number of prospective research directions. The main limitation is in the sample size. Our sample sizes for studies in Australia and China, although adequate for the tool used, are not large enough. It is also not a random sample. Our immediate plan is to do further analysis addressing the issues of measures and do large scale research in Australia and China. Despite the above limitations our research unearthed some interesting findings, which provide some valuable insights in the domain of on-line auction.

8. References

ACCC (Australian Competition & Consumer Commission) (2000) *Internet Auctions: What You Should Know*, August 2000, Available at: http://www.accc.gov.au/pubs/publciations/business-general/ecommerce/internetauctions.pdf [Accessed on April 13, 2003].

Agarwal, R. & Prased, J. (1999) 'Are Individual Differences Germane to The Acceptance of New Information Technologies', *Decision Sciences*, Vol. 30, No. 2, pp. 361-391.

Ajzen, I. (1991) The Theory of Planned Behaviour: Some Unresolved Issues, *Organizational Behaviour & Human Decision Processes*, Vol. 50, pp. 179 – 211.

Ajzen I. and Driver B. (1992), Application of theory of planned behavior to leisure choice, *Journal of Leisure Research*, vol. 24, no. 3, pp. 207-224.

Ba, S. and Pavlou, P. A. (2002) Evidence of the effect of Trust Building Technology in Electronic Markets: Price Premiums and Buyer Behaviour, Vol. 26, No. 3, pp. 243-268.

Ba, S., Whinston, A. B. and Zhang, H. (2003) Building Trust in Online Auction Markets through an Economic Incentive Mechanism, *Decision Support Systems*, Vol. 23, pp. 273-286.

Bakos, Y. (1998) The Emerging Role of Electronic Market Places on the Internet, *Communications of the ACM*, Vol. 41, No. 8, pp. 35-42.

Bapna, R., Goes, P. and Gupta, A. (2001) Comparative Analysis of Multi-item Online Auctions: Evidence from the Laboratory, *Decision Support Systems*, Vol. 32, pp. 135-153.

Bapna, R. Goes, P. and Gupta, A. (2003) Analysis and Design of Business-to-Consumer Online Auction, *Management Science*, Vol. 49, No. 1, pp. 85-101.

Bapna, R., Goes, P., Gupta, A. and Karuga, G. (2002) Optimal Design of the Online Auction Channel: Analytical, Empirical, and Computational Insights, *Decision Sciences*, Vol. 33, No. 4 , pp. 557-577.

Barclay, D, Higgins, C and Thompson, R. (1995) The Partial Least Squares (PLS) Approach to Causal Modeling: Personal Computer Adoption and Use as an Illustration, *Technology Studies,* Vol. 2, No. 2, pp. 285-309.

Beam, C and Segev, A. (2004). Auctions on the Internet: A Field Study, *Working Paper 98-WP-1032,* 1998. Available at http://haas.berkeley.edu/cmit/wp-1032.pdf, Accessed on July 28, 2004.

Beam, C., Segev, A., Bichler, M., and Krishnan, R. (1999) On Negotiation and Deal making in Electronic Markets, *Information Systems Frontiers*, Vol. 1, No., pp. 241-258.

Beedell, J D C and Rehman, T (1999), Explaining Farmers' Conservation Behaviour: Why do Farmers Behave the Way They Do?, *Journal of Environmental Management*, Vol 57, pp. 165-176.

Beedell, J and Rehman, T (2000), Using Social-Psychology Models to Understand farmers' Conservation Behaviour, *Journal of Rural Studies*, Vol 16, pp. 117-127.

Berger I. (1993), A framework for understanding the relationship between environmental attitudes and consumer behavior, in *Marketing Theory and Application*, eds. Varadarjan R. and Jaworski B., Chicago: American Marketing Association, vol. 4, pp. 157-163.

Budish, E.B. & Takeyama, L. N. (2001) Buy Prices in Online Auctions: Irrationality on the Internet?, *Economics Letters*, Vol. 72, pp. 325-333.

Cheung S.F, Chan K.S, and Wong S.Y (1999), Re-examining the Theory of Planned Behaviour in Understanding Wastepaper Recycling, *Environment and Behaviour*, vol. 31, no. 5, pp. 587-612.

Chin, W. (1998) The Partial Least Squares Approach to Structural Equation Modeling, in *Modern Methods for Business Research*, G. A. Marcoulides, Ed. Mahwah – NJ: Lawrence Erlbaum Associates, Inc., pp. 295-336.

Chin, W and P. R. Newsted, (1999) Structural Equation Modeling Analysis with Small Sample Using Partial Least Squares, in *Statistical Strategies for Small Sample Research*, R. H. Hoyle, Ed. Thousand Oaks – California: Sage Publication, Inc., pp. 307-341.

Chow, I.H.S.(1994) An Opinion Survey of Performance Appraisal Practices in Hong Kong and the People's Republic of China. *Asia Pacific Journal of Human Resource*, Vol. 32, No.3, pp. 67-78.

Emiliani, M. L. and Stec, D. J. (2002) Realizing Savings from Online Reverse Auction, *Supply Chain Management*, Vol. 17, No.1, pp.12-23.

Fornell, C. and Larcker, D. F. (1981) Evaluating Structural Equation Models with Unobservable Variables and Measurement Error, *Journal of Marketing Research,* XVIII, (February 1981), pp. 39-50.

Gefen, D., Straub, D. W. and Boudreau, M. C. (2000) Structural Equation Modeling and Regression: Guidelines for Research Practice, *Communications of the Association for Information Systems,* Vol. 4, No. 7, pp.1-77.

Gefan, D, Karahanna, E and Straub, D W (2003), Trust and TAM in On-line Shopping: An Integrated Model, *MIS Quarterly*, Vol 27 (1), pp. 51-90.

Gilkeson, J H and Reynolds, K. (2003) Determinants of Internet Auction Success and Closing Price: An Exploratory Study, *Psychology and Marketing*, Vol. 20, No. 6, pp. 537-566.

Hair, J. F., Anderson, R. E., Tatham, R. L. & Black, W.C. (1998) *Multivariate Data Analysis*, Fifth Edition, Prentice-Hall International: London.

Hartwick, J and Barki, H (1994), Measuring User Participation, User Involvement, and User Attitude, *MIS Quarterly*, Vol 18(1), pp. 59-82.

Heezen, J and Baets, W. (1996) The Impact of Electronic Markets: The Case of the Dutch Flower Auctions, *Journal of Strategic Information Systems*, Vol. 5, pp. 317 – 333.

Igbaria, M, Zinatelli, N, Cragg, P and Cavaye, A. L. M. (1997) Personal Computing Acceptance Factors in Small Firms: A Structural Equation Model, *MIS Quarterly,* September, pp. 279-302.

Jap, S. D. (2002) On-Line Reverse Auction: Issues, Themes, and Prospects for the future, *Academy of Marketing Science Journal*, Vol. 30, No. 4, pp. 506-525.

John, G., Wheeler, R., Coughlan, J., Bull, K., Armes, D., Jephcott, D., Bricknell, D. & Barling, B. (2002), The Price of Electronic Bids, *Supply Management*, September, pp.19-26.

Kamins, M. A., Dreze, X., and Folkes, V. S. (2004) Effects of Seller-Supplied Prices on Buyers' Product Evaluations: Reference Prices in an Internet Auction Context, *Journal of Consumer Research*, Vol. 30, No. 4, pp. 622-628.

Karahanna, E, Straub, D W and Chervany, N (1999), Information Technology Adoption Across Time: A Cross-sectional Comparison of Pre-Adoption and Post-Adoption Beliefs, *MIS Quarterly*, Vol 23 (2), pp. 183-213.

Ku, G. and Malhotra, D. (2001) The On-line Auction Phenomenon: Growth, Strategies, Promise and Problems, *Negotiation Journal*, Vol. 17, No. 4, pp.349-361.

Lansing, P. & Hubbard, J. (2002) Online Auctions: The Need for Alternative Dispute Resolution, *American Business Review*, January, pp. 108-116.

Lee, H. G. (1997) AUCNET: Electronic Intermediary for Used Car Transactions, *Electronic Markets*, Vol. 7, No. 4, pp. 24 – 28.

Limayem, M., Khalifa, M. and Frini, A. (2000) What Makes Consumers Buy from Internet? A Longitudinal Study of Online Shopping, *IEEE Transactions on Systems, Man and Cybernetics – Part A: Systems and Humans*, Vol. 30, No. 4, pp. 421 – 432.

Lucking-Reiley, D. (2000) Auctions on the Internet: What's Being Auctioned, and How? *The Journal of Industrial Economics*, XLVIII, No. 3, pp. 227 – 252.

Neo, B. S. (1992) The Implementation of an Electronic Market for Pig Trading in Singapore, *Journal of Strategic Information Systems*, Vol. 1, No. 5, pp. 278 – 288.

Madden T.J, Ellen P.S. and Ajzen I. (1992), A Comparison of the Theory of Planned Behaviour and the Theory of Reasoned Action, *Personality and Social Psychology Bulletin*, vol. 18, no. 1, pp. 3-9.

McDonald, C. G. & Slawson, V. C. (2002) Reputation in an Internet Auction Market, *Economic Inquiry*, Vol. 40, No. 4 , pp. 633-650.

Pavlou, P A (2002), Institutional Trust in Interorganizational Exchange Relationships: The Role of Electronic B2B Marketplaces, *Journal of Strategic Information Systems*, Vol 11 (4), pp. 105-143.

Quaddus, M A and Tung, L L (2002), Culture: Explaining the Differences in Decision Conferencing, *Communications of the ACM*, Vol 45, No 8, pp 93-98.

Randall D. and Gibson A. (1991), Ethical decision making in the medical profession: An application of the theory of planned behavior, *Journal of Business Ethics*, vol. 10, no. 2, pp. 111 - 122.

Rogers, E. M. (1995), *Diffusion of Innovations*, 4th ed., Free Press: New York.

Schneider, S.C. & Barsoux, J.L.(1997*) Managing Across Cultures*, Prentice Hall: Europe.

Segev, A. and Beam, C., (1998) Auctions as Negotiations, Available at http://www.haas.berkeley.edu/~citm/auction/curraauction.html, Accessed on July 28 2004.

Triandis H.C. (1980), Values, Attitudes, and Interpersonal Behavior, in *Beliefs, Attitudes and Values*, ed. Page H. M., University of Nebraska Press, Lincoln, pp 125-143.

Tung, L L and Quaddus, M. A. (2002), Cultural Differences Explaining the Differences in Results in GSS: Implications for the Next Decade, *Decision Support Systems*, Vol. 33, pp. 177 – 199.

Turban, E. (1997) Auctions and Bidding on the Internet: An Assessment, *Electronic Markets*, Vol. 7, No. 4, pp. 7 – 11.

Vaculik, J. (2003) Bidding by the Bar: On-line Auction Sites for Legal Services, *Texas Law Review*, Vol. 82, No. 2, pp. 445-480.

Van Heck, E and Vervest, P. (1998) How should CIOs deal with web-based auctions? *Communications of the ACM*, Vol. 41, No. 7, pp. 99-100.

Wang, K., Wang, E. T. G. and Tai, C. F. (2002) A Study of Online Auction Sites in Taiwan: Product, Auction Rule, and Trading Type, *International Journal of Information Management*, Vol.22, pp. 127 – 142.
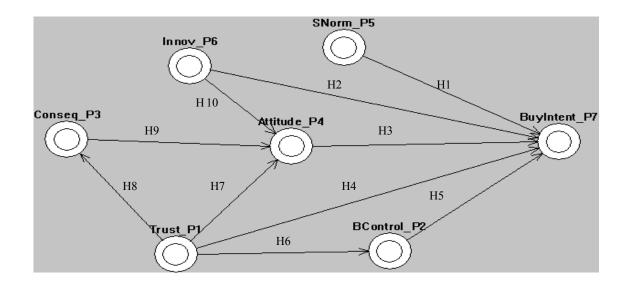
9. Appendices

Figure-1: On-Line Auction Adoption Research Model

Table-1: Item Loadings for Australian Study

Items (observed variables)	Loading	Items (observed variables)	Loading
Trust_P1a	0.76	Conseq_P3g	0.49
Trust_P1b	0.70	Conseq_P3h	0.68
Trust_P1c	0.69	Conseq_P3i	0.56
Trust_P1d	0.69	Conseq_P3j	0.47
Trust_P1e	0.63	Attitude_P4a	0.60
Trust_P1f	0.50	Attitude_P4b	0.87
Trust_P1g	0.72	Attitude_P4c	0.82
Trust_P1h	0.68	Attitude_P4d	0.87
Trust_P1i	0.86	Attitude_P4e	0.79
BControl_P2a	0.53	Attitude_P4f	0.89
BControl_P2b	0.60	Attitude_P4g	0.86
BControl_P2c	0.66	SNorm_P5a	0.87
BControl_P2e	0.73	SNorm_P5b	0.82
BControl_P2f	0.73	SNorm_P5c	0.83
BControl_P2g	0.70	SNorm_P5d	0.80
BControl_P2h	0.68	Innov_P6a	0.88
BControl_P2k	0.69	Innov_P6b	0.88
BControl_P2l	0.75	Innov_P6c	0.85
BControl_P2n	0.57	Innov_P6d	0.73
BControl_P2o	0.43	BuyIntent_P7a	0.51

Items	Loading	Items	Loading
BControl_P2p	0.73	BuyIntent_P7b	0.62
Conseq_P3a	0.72	BuyIntent_P7c	0.87
Conseq_P3b	0.79	BuyIntent_P7d	0.93
Conseq_P3c	0.82	BuyIntent_P7e	0.88
Conseq_P3d	0.56	BuyIntent_P7f	0.87
Conseq_P3e	0.54	BuyIntent_P7g	0.88
Conseq_P3f	0.77	BuyIntent_P7h	0.83

Table-2: Item Loadings for Chinese Study

Items (observed variables)	Loading	Items (observed variables)	Loading
Trust_P1a	0..72	Conseq_P3g	0.41
Trust_P1b	0.85	Conseq_P3h	0.80
Trust_P1c	0.76	Conseq_P3i	0.78
Trust_P1d	0.67	Conseq_P3j	0.80
Trust_P1e	0.82	Attitude_P4a	0.64
Trust_P1f	0.56	Attitude_P4b	0.83
Trust_P1g	0.76	Attitude_P4c	0.90
Trust_Pli	0.66	Attitude_P4d	0.85
BControl_P2a	0.60	Attitude_P4e	0.85
BControl_P2b	0.73	Attitude_P4f	0.79
BControl_P2c	0.66	SNorm_P5a	0.84
BControl_P2e	0.81	SNorm_P5b	0.83
BControl_P2f	0.82	SNorm_P5c	0.88
BControl_P2g	0.77	SNorm_P5d	0.87
BControl_P2h	0.80	Innov_P6a	0.82
BControl_P2i	0.67	Innov_P6b	0.90
BControl_P2k	0.75	Innov_P6c	0.83
BControl_P2l	0.75	Innov_P6d	0.60
BControl_P2m	0.60	BuyIntent_P7a	0.63
BControl_P2n	0.66	BuyIntent_P7b	0.55
BControl_P2o	0.66	BuyIntent_P7c	0.82
BControl_P2p	0.82	BuyIntent_P7d	0.82
BControl_P2q	0.44	BuyIntent_P7e	0.87
Conseq_P3a	0.78	BuyIntent_P7g	0.80

Conseq_P3b	0.69	BuyIntent_P7h	0.75
Conseq_P3c	0.71		

Table-3: Internal Consistencies for Australian Study

Latent Variables	Internal Consistencies
Trust_P1	0.89
BControl_P2	0.90
Conseq_P3	0.93
Attitude_P4	0.93
SNorm_P5	0.90
Innov_P6	0.90
BuyIntent_P7	0.94

Table-4: Internal Consistencies for Chinese Study

Latent Variables	Internal Consistencies
Trust_P1	0.90
BControl_P2	0.94
Conseq_P3	0.87
Attitude_P4	0.92
SNorm_P5	0.92
Innov_P6	0.87
BuyIntent_P7	0.90

Table-6: Correlation of Latent Variables & Square Roots of AVE for Chinese Study

	Trust_P1	BControl_P2	Conseq_P3	Attitude_P4	SNorm_P5	Innov_P6	BuyIntent_P7
Trust_P1	**0.73***						
BControl_P2	0.72	**0.71**					
Conseq_P3	0.59	0.62	**0.71**				
Attitude_P4	0.20	0.23	0.54	**0.82**			
SNorm_P5	0.13	0.14	0.38	0.63	**0.86**		
Innov_P6	0.49	0.68	0.68	0.57	0.51	**0.79**	
BuyIntent_P7	0.12	0.41	0.41	0.54	0.71	0.52	**0.75**

(* the bold elements in the main diagonal are the square roots of AVE)

Table-5: Correlation of Latent Variables & Square Roots of AVE for Australian Study

	Trust_P1	BControl_P2	Conseq_P3	Attitude_P4	SNorm_P5	Innov_P6	BuyIntent_P7
Trust_P1	**0.70***						
BControl_P2	0.57	**0.66**					
Conseq_P3	0.29	0.495	**0.66**				
Attitude_P4	0.007	0.20	0.48	**0.82**			
SNorm_P5	0.002	0.088	0.097	0.427	**0.83**		
Innov_P6	0.178	0.274	0.236	0.408	0.03	**0.84**	
BuyIntent_P7	0.102	0.091	0.323	0.78	0.59	0.292	**0.81**

(* the bold elements in the main diagonal are the square roots of AVE)

Table-7: Tests of Structural Models for Australian and Chinese Studies

Hypotheses	China Study		Australian Study	
	Standardized path coefficients	t-value	Standardized path coefficients	t-value
H1: SNorm_P5 → BuyIntent_P7	0.54	6.20***	0.29	3.41***
H2: Innov_P6 → BuyIntent_P7	0.26	2.39**	0.009	0.099
H3: Attitude_P4 → BuyIntent_P7	0.09	0.82	0.678	7.23***
H4: Trust_P1 → BuyIntent_P7	0.03	0.33	0.177	2.09**
H5: BControl_P2 → BuyIntent_P7	0.17	1.93*	0.123	1.24
H6: Trust_P1 → BControl_P2	0.72	14.03***	0.577	8.02***
H7: Trust_P1 → Attitude_P4	0.23	2.47**	0.201	1.50
H8: Trust_P1 → Conseq_P3	0.59	7.55***	0.292	2.09**
H9: Conseq_P3 → Attitude_P4	0.40	4.61***	0.460	3.81***
H10: Innov_P6 → Attitude_P4	0.41	4.22***	0.335	3.19***
R Square	R^2 for BuyIntent_P7 = 0.55 R^2 for Attitude_P4 = 0.40 R^2 for Conseq_P3 = 0.34 R^2 for BControl_P2 = 0.52		R^2 for BuyIntent_P7 = 0.71 R^2 for Attitude_P4 = 0.359 R^2 for BControl_P2 = 0.333 R^2 for Conseq_P3 = 0.085	

*p<0.05, ** p < 0.025; ***p<0.01