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The Acceptance of Online Grocery Shopping

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Abstract

The Internet has been increasingly used to facilitate online business transactions between business entities and consumers for various products and services. One of the applications that has received much attention in the last few years is Online Grocery Shopping (OGS). There is, however, no concrete evidence that OGS has been widely adopted as initially predicted. To enrich the existing studies in this context, which are currently limited, this paper explores the Australian consumer's perception of Online Grocery Shopping in order to identify some factors that may foster or hinder its acceptance. The Technology Acceptance Model (TAM) is employed to provide the theoretical foundation for this study. Based on the empirical data collected from a survey, the findings demonstrate the strength of the TAM in exploring the acceptance of OGS in Australia. In addition, the visibility of OGS was also found to be an important factor for its acceptance by the community.

1. Introduction

In this era of globalisation, the Internet has been increasingly used to facilitate online business transactions, not only between different business entities, but also between business entities and consumers. One of the Internet business applications that has received much attention in the last few years is Online Grocery Shopping (OGS) (Belsie, 1998). Online Grocery Shopping refers to the use of retailers' web sites by consumers to purchase grocery products by simply clicking the mouse button for the required items. Home delivery will then be made by the retailer. OGS has many potential benefits to consumers, particularly in terms of convenience and time-savings. In addition, the retailers will ultimately reap siginificant benefits as it will lead to more efficient use of personnel and simplification of building infrastructure (Kurnia and Johnston, 1999; Australian Retailers Association, 2000; Morganosky and Cude, 2000; Slonae, 2000).

Online Grocery Shopping was first offered in the United States in the late 1980s (Belsie, 1998) but it has been adopted in other regions, notably European countries and Australia. Despite the many benefits of OGS, however, no concrete evidence indicates that OGS has been widely adopted as initially predicted (Schuster and Sporn, 1998; Heikkila et al.,

1999; Morgan, 2000). At this stage, there are very limited studies conducted in assessing the acceptance of OGS and exploring the consumers‘ perception of OGS. The aim of this study is therefore to understand the Australian grocery consumers' perception of OGS in order to identify various factors affecting the acceptance. For this purpose, a survey was conducted with a number of Australian grocery consumers. The Technology Acceptance Model (TAM), which has been widely used in technology adoption studies, was employed to provide the theoretical foundation for this study.

The findings demonstrate the applicability of the Technology Acceptance Model in assessing the acceptance of Online Grocery Shopping in Australia. The perceived usefulness and perceived ease of use of OGS were found to have positive impacts on the attitude towards using OGS. Likewise, the behavioural intention to use OGS is influenced by the attitude, and finally the behavioural intention to use OGS affects the actual usage. In addition to the factors suggested by the TAM, this study also shows that the visibility of Online Grocery Shopping has a strong positive impact on the attitude towards using OGS.

Because of the uniqueness of the Australian market structure, in which the consumers are fewer in number and dispersed over a wider geographical area than in the US and Europe, this study has the potential to contribute to the exisiting literature on the adoption of electronic commerce enabled technology, particularly in the area of business-to-consumer (B2C) applications. In practice, the findings of this study can be used by Australian retailers and other retailers in general to formulate a more effective strategy in encouraging consumers to use Online Grocery Shopping.

In the next section, the development of the conceptual model of Online Grocery Shopping acceptance is discussed. We then describe the survey research method employed in this study and present the findings. We conclude the paper by outlining the implications to theory and practice, the limitation to this study and some related future research.

2. Developing a Conceptual Model of the Acceptance of OGS

The advance of the Internet technology has enabled businesses to reach consumers in dispersed geographical locations easily. Online shopping facilitiated by the Internet, has provided consumers with enormous benefits, particularly in terms of time savings and convenience (Park et al., 1998). Despite some concerns with security issues, the use of online shopping has been increasing in the last few years (Park et al., 1998; Australian Retailers Association, 2000; Morgan, 2000). This trend is particularly caused by the increasing number of people with computer facilities such as personal computers, modems, and subscription to online services at home or in the workplace (Park et al., 1998).

A number of recent studies further indicated that there has been a high interest in purchasing groceries online in the US, various European countries and Australia (Spare and Pulkkinen, 1997; Schuster and Sporn, 1998; Heikkila et al., 1999; Morgan, 2000). Several factors explaining the demand for more convenient ways to buy groceries include greater labour-force participation by women, a greater number of dual-income and thus higher-income households, and a greater number of single parent and elderly households with resource constraints (Park et al., 1998). To date, however, there is no concrete evidence that Online Grocery Shopping has been widely accepted by the community. Factors facilitating and barriers to the acceptance of Online Grocery Shopping, as an example of electronic commerce enabled innovation, have not been explored and understood.

The study of adoption of various technological innovations has attracted the attention of many researchers and practitioners for many years (Pfeffer, 1982; Chaffe, 1985; King, 1990; Keil, 1991; Slappendel, 1996). Various frameworks and models have been developed to explore determinants of technology acceptance and adoption, including the Diffusion of Innovations model (Rogers, 1983), theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1975), theory of Planned Behaviour (TPB) (Ajzen, 1985), the Technology Acceptance Model (TAM) (Davis, 1989)and various extended models of the TAM (Davis et al., 1989; Dishaw and Strong, 1999; Davis and Venkatesh, 2000). Among the many adoption models, the TAM has been claimed to be the most influential and widely adopted to predict the acceptance and use of various technologies due to its strength in theoretical basis and empirical support (Saga and Zmud, 1994). Therefore, this study has adopted the TAM with minor modifications to assess the acceptance of Online Grocery Shopping in Australia.

Figure 1 depicts the acceptance model of Online Grocery Shopping. The model was mainly derived from the TAM, with three additional constructs, namely 'Perceived Risk', 'Visibility'(derived from Rogers' diffusion of innovation), and 'Social Influence' (derived from the Theory of Reasoned Action). These three constructs are shown in italics in Figure 1. Nine hypothetical relationships between various constructs in Figure 1 were established, as discussed below.

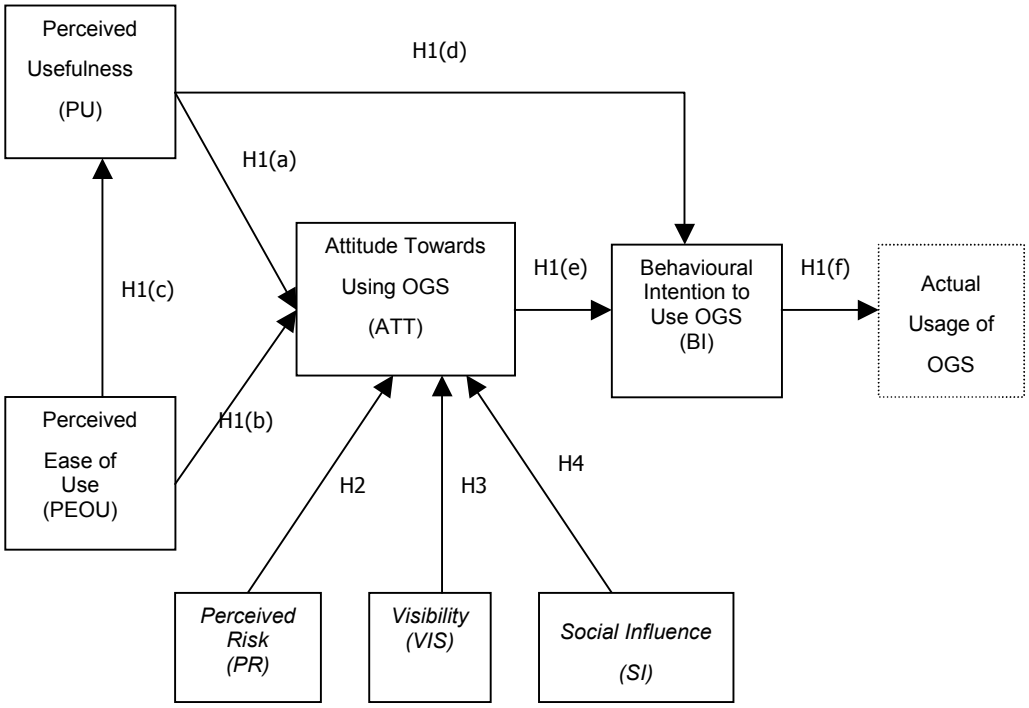

Figure 1: *The Acceptance Model of Online Grocery Shopping*

Six hypotheses (H1(a) to H1(f) in Figure 1) originated from the TAM. The TAM was developed by Davis (1989) based on the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1975) to explain computer usage behaviour. The goal of the TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis, 1989, p.985). It proposes that 'Perceived Usefulness' (PU) and 'Perceived Ease of Use' (PEOU) of potential adopters are two important determinants for

the actual usage of a technological innovation. PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" while PEOU refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p.320). Based on this, we therefore constructed the following hypotheses in relation to OGS acceptance:

H1 (a): There is a positive relationship between Perceived Usefulness and Attitude towards using Online Grocery Shopping.

H1 (b): There is a positive relationship between Perceived Ease of Use and Attitude towards using Online Grocery Shopping.

In addition, the improved model of TAM (Davis, 1993) suggests that Perceived Usefulness is influenced by Perceived Ease of Use, but not vice versa, since easy-to-use technology is more useful than hard-to-use technology, but useful technology may not be easy to use. This relationship has been confirmed in a number of other studies (see for examples, (Davis et al., 1989; Davis, 1993; Taylor and Todd, 1995; Chau, 1996). Therefore, we hypothesized that if consumers found Online Grocery Shopping easy to use, then they would also find it useful.

H1 (c): There is a positive relationship between Perceived Ease of Use and Perceived Usefulness

The TAM further postulates that the perceptions of the potential adopters in terms of usefulness and ease of use influence their attitude, which may generate behavioural intention (BI) to use a particular technology. Their behavioural intention will then lead to the actual usage (AU) (Ajzen and Fishbein, 1975; Davis et al., 1989). These relationships were also examined in the context of Online Grocery Shopping using the following hypotheses:

H1 (d): There is a positive relationship between Perceived Usefulness and Behavioural Intention to use Online Grocery Shopping.

H1 (e): There is a positive relationship between Attitude towards using and Behavioural Intention to use Online Grocery Shopping.

H1 (f): There is a positive relationship between Behavioural Intention to use and Actual Usage of Online Grocery Shopping.

Besides the constructs proposed by the TAM, two additional factors identified from Rogers' Diffusion of Innovation theory were also recognised to influence the attitude towards using OGS. Firstly, perceived risk, which has been a common obstacle to electronic commerce technologies adoption (Bauer, 1960; Webster, 1969; Ostlund, 1974; Rhee and Riggins, 1997; Kurnia and Johnston, 1999), was also believed to affect the attitude towards using OGS. Furthermore, we believed that visibility, which refers to the degree to which an innovation is apparent to the potential adopters (Rogers, 1983), affected the attitude. The following two hypotheses were therefore formulated:

H2: There is a negative relationship between Perceived Risk and Attitude towards using Online Grocery Shopping.

H3: There is a positive relationship between Visibility of Online Grocery Shopping and Attitude towards using Online Grocery Shopping.

Finally, according to the Theory of of Reasoned Action (Ajzen and Fishbein, 1975), a person's behavioural intention (BI) is also affected by subjective norm (SN) concerning the behaviour. Subjective norm, which refers to the social pressure exerted on the person to perform the behaviour, is then affected by normative beliefs and motivations to comply (Ajzen, 1985). Thus, a person may choose a particular behaviour although s/he is not favourable towards the behaviour and its consequences, if s/he thinks that one or more

references believe s/he should behave in such a manner and there are sufficient motivations to comply. The effect of subjective norm on behavioural intention is also in accordance with the extended TAM proposed by Davis et al. (1989).

In this study the effect of the subjective norm was therefore assessed in a construct named 'Social Influence (SI)' (see Figure 1). We assumed that if superiors, co-workers, or relatives believed that OGS was useful, then a person might agree and accept their belief and in turn establish an intention to use it. However, since OGS is still in an early stage of adoption, we hypothesized that social influence would positively influence the attitude (instead of the intention to use), which would then affect the intention to use. This would allow us to observe whether the existence of social influence would affect a person's decision to use OGS.

H4: There is a positive relationship between Social Influence and the Attitude towards using Online Grocery Shopping.

In summary, the model shown in Figure 1 suggests that the perception of the potential adopters in terms of usefulness, ease of use, and risk, as well as the existence of social influence and visibility of the technology influence the attitude towards using Online Grocery Shopping. This attitude then determines the behavioural intention to use OGS and the behavioural intention will in turn influence the actual usage of OGS.

3. Research Method

For the purpose of this study, a survey was administered to explore consumers' perceptions of Online Grocery Shopping in Australia. An online questionnaire was developed to collect the required data in the most efficient manner possible (Batinic, 1997). The questionnaire was distributed via electronic mail to the potential participants. The convenience sampling technique, one of the most commonly used techniques of non-probability sampling (Fink, 1995), was employed to obtain the potential participants identified from various mailing lists (Batinic, 1997). The unit of analysis was any grocery consumer with or without experience in Online Grocery Shopping who lives in Australia.

An initial invitation letter describing the project and seeking participation were e-mailed out to 500 potential participants. 385 potential participants expressed their agreement to participate in the survey by replying to the invitation e-mail. For each of them, an e-mail detailing the URL of the questionnaire was then sent out. There were 250 replies received within two weeks. After sending a follow-up email to those potential participants who had not replied, additional 83 replies were obtained, which added up to 333 total responses (86% response rate).

To enhance the validity and reliability of the questionnaire, the questions were asked in the simplest possible way to avoid various interpretations. In addition, pilot tests were conducted with 10 grocery consumers in four phases. In the first phase, where four participants were involved, some unclear definitions and ambiguous questions were discovered. After being improved, the questionnaire was tested again with three different individuals in the second phase. Further improvement of the questionnaire was carried out in terms of the format, layout, and contents. In the third phase, two individuals were involved and the questionnaire was further enhanced in respect to the flow in answering the questions. Finally, the time required to complete the questionnaire was identified from one participant in the last phase. The participant did not encounter any problem in answering the questionnaire.

Table 1: *The Questionnaire Items*

Code	Item Description
Perceived Usefulness	
PU_1	Using Online Grocery Shopping can improve my efficiency in purchasing groceries.
PU_2	Using Online Grocery Shopping can save me a lot of time.
PU_3	Using Online Grocery Shopping can enhance my effectiveness in purchasing groceries.
PU_4	Using Online Grocery Shopping can make my grocery shopping easier.
PU_5	Using Online Grocery Shopping can increase my productivity.
PU_6	Using Online Grocery Shopping can overcome the obstacles for physically disabled people.
PU_7	Using Online Grocery Shopping can overcome the obstacles for elderly people.
PU_8	Using Online Grocery Shopping is/might be convenient for my grocery shopping.
Perceived Ease of Use	
PEOU_1	Online Grocery Shopping is/might be easy-to-use.
PEOU_2	It is/might be easy to become skillful at using Online Grocery Shopping.
PEOU_3	My interaction with the processes of Online Grocery Shopping is/might be clear and understandable.
PEOU_4	It is/might be easy for me to follow the procedures when ordering groceries online.
Attitude Towards Using Online Grocery Shopping	
ATT_1	Using Online Grocery Shopping in purchasing groceries is a good idea.
ATT_2	Using Online Grocery Shopping in purchasing groceries is/might be pleasant.
ATT_3	Using Online Grocery Shopping is/might be beneficial to me.
Behavioural Intention to use Online Grocery Shopping	
BI_1	I intend to use Online Grocery Shopping when the service becomes widely available.
BI_2	Whenever possible, I intend to use Online Grocery Shopping to purchase groceries.
BI_3	I intend to use Online Grocery Shopping when there is free home delivery.
BI_4	I intend to use Online Grocery Shopping when the price is competitive.
Perceived Risk	
PR_1	I am concerned with the payment security aspects of Online Grocery Shopping.
PR_2	I am concerned with the privacy of my information provided when using Online Grocery Shopping.
PR_3	I am concerned with the punctuality of the delivery time of Online Grocery Shopping.
PR_4	I am concerned with the quality of the products delivered when ordering from Online Grocery Shopping.
Visibility	
VIS_1	I have seen others using Online Grocery Shopping.
VIS_2	In my organisation/school, one easily sees Online Grocery Shopping being used.
VIS_3	I have seen Online Grocery Shopping being used outside my organisation/school.
VIS_4	It is easy for me to see others using Online Grocery Shopping in public.
Social Influence	
SI_1	I will use Online Grocery Shopping if the service is widely used by people in my community.
SI_2	I will adopt Online Grocery Shopping if my boss uses it.
SI_3	I will adopt Online Grocery Shopping if my friends/relatives use it.

The questionnaire items for this study were developed based on various sources (see for example, (Davis, 1989; Rhee and Riggins, 1997; Heikkila et al., 1999; Hu et al., 1999; Malhotra and Galletta, 1999; Tan and Teo, 2000; Wu and Lin, 2000; George et al., 2001)), since it is practical to use exisitng, well-developed questionnaires that have been tested for their validity and reliability (Lucas, 1991). Table 1 summarises the questionnaire items for each construct of this study. For each item, the survey respondents were requested to indicate whether they agree or disagree based on a seven-point scale: from 'strongly agree' to 'strongly disagree'.

To measure the reliability for each construct used in the questionnaire, 'Chronbach's Alpha' was deployed. 'Corrected Item-Total Correlation' was used to measure convergent validity of each item within a construct (Nunnaly, 1978). Three statistical techniques were adopted to test the nine hypotheses in SPSS for the research model: Pearson's correlation, multiple regression and Pointed-Biserial Correlation. Multiple Regression, which is normally used to explore the relationship between one continuous dependent variable and a number of independent variables (Pallant, 2001), was appropriate to test the hypotheses H1(a), H1(b), H1(d) H1(e), H2, H3 and H4 of the

research model. Pearson's correlation was appropriate to test hypothesis H1(c), since it is designed to test the relationship between two continuous variables (Pallant, 2001). Finally, Pointed-Biserial Correlation, used when measuring on a continuous variable and a dichotomous variable, was appropriate to test the hypothesis H1(f). A 5% level of significance was used to examine the association between variables as this is considered an acceptable standard for social science research (Neuman, 1994).

4. The Survey Findings

Validity and Reliability

The reliability of each construct was first measured with Cronbach's alpha. A construct is considered reliable if it has an alpha value of greater than 0.7 (Pallant, 2001). The Cronbach's alpha coefficient (α) for each construct is all greater 0.7, as depicted in Table 2. Thus, all constructs in the research model are considered reliable.

Table 2: *Theoretical Constructs and Their Cronbach's Alpha Coefficients*

Construct	Cronbach's Alpha (α)
Perceived Usefulness	0.8931
Perceived Ease of Use	0.8620
Attitude towards using OGS	0.8848
Behavioural Intention to use OGS	0.8844
Perceived Risk	0.8291
Visibility	0.8680
Social Influence	0.7949

The "Corrected Item-Total" correlations for all questionnaire items of each construct as shown in Table 1 were also examined. Since the "Corrected Item-Total" correlations for thirty items within the seven constructs are all above 0.50 (see Appendix 1), no item was eliminated (Churchill, 1979). The high values of item-total correlations for all questionnaire items used in this study supports the convergent validity (Pallant, 2001).

Demographics Information

Table 3 illustrates the locations of the survey distribution, the number of questionnaires sent to the participants and the responses obtained from each State of Australia. The vast majority (92.2%) of the survey respondents were from Victoria (VIC), while the rest were from other States of Australia. The demographics information of the participants is depicted in Table 4.

Table 3: *Survey Distribution and Responses by State*

	Distributed		Returned	
State	**Frequency**	**%**	**Frequency**	**%**
VIC	343	89.1	307	92.2
NSW	16	4.2	9	2.7
QLD	15	3.9	9	2.7
ACT	4	1.0	2	0.6
TAS	4	1.0	2	0.6
WA	2	0.5	1	0.3
NT	1	0.3	330	99.1
Total	385	100.0	333	100.0

Table 4: *Demographic Information of the Survey Respondents*

Demographics Information	**Number**	**%**
Age (n=332)*		
Under 18	29	8.7
18-25	122	36.7
26-45	129	38.9
46-60	46	13.9
60 above	6	1.8
Gender (n=332)*		
Male	168	50.6
Female	164	50.4
Educational level (n=332)*		
High school or less	94	28.3
Diploma	40	12.0
Bachelor	140	42.2
Masters	45	13.5
Doctorate	13	4.0
Income level (n=314)*		
Less than $1,000	41	13.1
$1,000 - $9,999	50	15.9
$10,000 - $19,999	34	10.9
$20,000 - $29,999	31	9.9
$30,000 - $49,999	62	19.7
$50,000 - $ 69,999	45	14.3
$70,000 and over	51	16.2
Marital Status (n=328)*		
Never married	200	61.0
Married/DeFacto	116	35.4
Divorced/Separated	12	3.6
Spouse's Income Level (n=298)*		
Not Applicable	194	*65.2*
Less than $1,000	4	1.3
$1,000 - $9,999	14	4.7
$10,000 - $19,999	11	3.7
$20,000 - $29,999	17	5.7
$30,000 - $49,999	29	9.7
$50,000 - $ 69,999	15	5.0
$70,000 and over	14	4.7

**Not all respondents indicated the demographics information*

Hypotheses Testing

Hypotheses H1(a), H1(b), H2, and H3 were tested using Multiple Regression Analysis. In this analysis, the dependent variable was Attitude Towards Using OGS and the independent variables were Perceived Usefulness, Perceived Ease of Use, Perceived Risks, Visibility, and Social Influence. Table 5 summarises the result of this multiple regression.

Perceived Usefulness, Perceived Ease of Use, and Visibility, were found to have significant standardised regression coefficients (p-value= 0.000), in which Visibility has the smallest weighting. Perceived Risk and Social Influence, however, do not have a significant relationship with the Attitude Towards Using OGS. Thus, people who perceive Online Grocery Shopping as useful, easy-to-use and visible will have a more positive attitude towards using Online Grocery Shopping. On the other hand, those who perceive OGS as risky do not necessarily have a negative attitude towards OGS. Likewise, social influence does not affect the attitude towards the use of OGS. In conclusion, hypotheses H1(a), H1(b), H3 are accepted, while H2, H4 are rejected.

Table 5: *Multiple Regression Analysis for Attitude Towards Using OGS*

Variables	B	Std. Error	Beta	t	p-value
PU	0.604	0.051	0.563	11.772	0.000*
PEOU	0.257	0.053	0.220	4.799	0.000*
PR	-0.0211	0.040	-0.021	-0.531	0.596
VIS	0.049	0,038	0.090	1.318	0.042*
SI	0.088	0.044	0.055	2.043	0.189
R2(adj)= 0.559	Std. Error= 0.98	F=74.085	p=0.000		

** indicates statistical significance at (p<0.05)*

Furthermore, hypotheses H1(d) and H1(e) were also tested using Multiple Regression Analysis. In this regression analysis, the dependent variable was Behavioural Intention to Use OGS and the independent variables were Perceived Usefulness and Attitude Towards Using OGS. Table 6 summarises the results of the analysis.

Table 6: *Multiple Regression Analysis for Behavioural Intention to Use OGS*

Variables	B	Std. Error	Beta	t	p-value
PU	0.328	0.074	0.286	4.442	0.000*
ATT	0.410	0.068	0.385	5.991	0.000*
R2(adj)= 0.390	Std. Error= 0.98	F= 74.085	p=0.000		

** indicates statistical significance at (p<0.05)*

Both Perceived Usefulness and Attitude Towards Using OGS were found to have significant standardised regression coefficients (p-value= 0.000), although Attitude Towards Using OGS (Beta=0.385) has a larger effect than Perceived Usefulness (Beta=0.286) on Behavioural Intention to Use OGS. Thus, this finding confirms the view that people who perceive Online Grocery Shopping as useful and have a positive attitude towards using OGS will have a positive behavioural intention to use Online Grocery Shopping. Therefore, the hypotheses H1(d) and H1(e) are accepted.

Hypothesis H1(c) was tested using Pearson's correlation, as described in the above section. The result demonstrates that there is a strong positive relationship between PEOU and PU (r=0.508; p=0.000) at 0.01 significance level. Table 7 summarises the result of

the Pearson correlation. Thus, there exists a positive relationship between Perceived Ease of Use and Perceived Usefulness in the context of the Online Grocery Shopping acceptance. This suggests that H1(c) should be accepted.

Table 7: *Pearson Correlation between PU and PEOU*

		Perceived Usefulness (PU)	**Perceived Ease of Use (PEOU)**
Perceived Usefulness	Pearson Correlation	1.000	0.508
	Sig. (2-tailed)	.	0.000
	N	324	309
Perceived Ease of Use	Pearson Correlation	0.508	1.000
	Sig. (2-tailed)	0.000	.
	N	309	315

*** Correlation is significant at the 0.01 level (2-tailed).*

Finally, Pointed-Biserial Correlation was employed to test the hypothesis H1(f). To measure the actual usage of Online Grocery Shopping in Australia, the survey respondents were asked the number of times they had used Online Grocery Shopping, based on the following scale: never, 1, 2, 3 or more. The responses were then recomputed into a two-point scale: 0=never used and 1=used. Pointed-Biserial Correlation was then performed with one dichotomous variable (AU) and one continuous variable (BI). The Pointed-Biserial Correlation was then calculated using a Pearson's correlation, as shown in Table 8.

Table 8: *Point-Biserial Correlation between Actual Use and Behavioural Intention to Use OGS.*

		Actual Usage (AU)	**Behavioural Intention (BI)**
Actual Usage (AU)	Pearson Correlation	1.000	.249*
	Sig. (2-tailed)	.	.000
	N	331	323
Behavioural Intention (BI)	Pearson Correlation	.249*	1.000
	Sig. (2-tailed)	.000	.
	N	323	324

** Correlation is significant at the 0.01 level (2-tailed).*

The result demonstrates that there is a weak positive relationship between BI and AU (r=0.249; p=0.000) at 0.01 significance level. Thus, there exists a positive relationship between Behavioural Intention to use OGS with the Actual Usage of OGS in Australia. This suggests that the hypothesis H1(f) should be accepted.

5. Discussion and Conclusion

The findings of the study have demonstrated the applicability of the Technology Acceptance Model in assessing the acceptance of Online Grocery Shopping in Australia, as an example of B2C electronic commerce enabled technology application. All of the constructs proposed in the TAM and their relationships were found to be relevant in this study. The Perceived Usefulness of Online Grocery Shopping is influenced directly by

its Perceived Ease of Use. In addition, these two constructs do positively affect the Attitude towards using Online Grocery Shopping and this attitude, in turn, influences the Behavioural Intention and the Actual Usage of OGS. This study, thus, will enrich the literature on the electronic commerce enabled technology adoption employing the TAM, which is currently still limited (Gefen and Straub, 2000).

In addition, this study has showed that the visibility of Online Grocery Shopping has indeed a positive impact on the attitude towards using OGS. This implies that the more often potential adopters observe Online Grocery Shopping used by others, the more likely they establish a positive attitude towards using it. Intriguingly, the perceived risk, which has been found to be one of the major obstacles to the adoption of electronic commerce technologies (for example, Ostlund, 1974; Kurnia and Johnston, 1999), and social influence were discovered to have no influence on the attitude. One possible reason for this finding is that Online Grocery Shopping is still a relatively new for the grocery consumers in Australia. As a result, many consumers do not have a high level understanding of the risks involved and there is no strong social influence to motivate them to use OGS. Figure 2 depicts the revised acceptance model of Online Grocery Shopping. The value of significance (P-value) is also included for each accepted hypothesis ($p < 0.05$).

One of the important implications of this study to practice is that the Australian grocery retailers need to ensure that the web sites developed to faciliate Online Grocery Shopping be useful and easy to use by the consumers. In addition, they may need to device a better marketing strategy to ensure the visibility of the services provided through Online Grocery Shopping, while at same time, demonstrate the benefits of shopping online.

One of the limitations of this study is that since the survey respondents were dominated by the Victorian respondents, the results of this study could be biased towards the Victorian grocery consumers. However, it is expected that Victorian gorcery consumers would not behave very differently from those in other States of Australia. Thus, this should not by any means invalidate the generalisability of the findings.

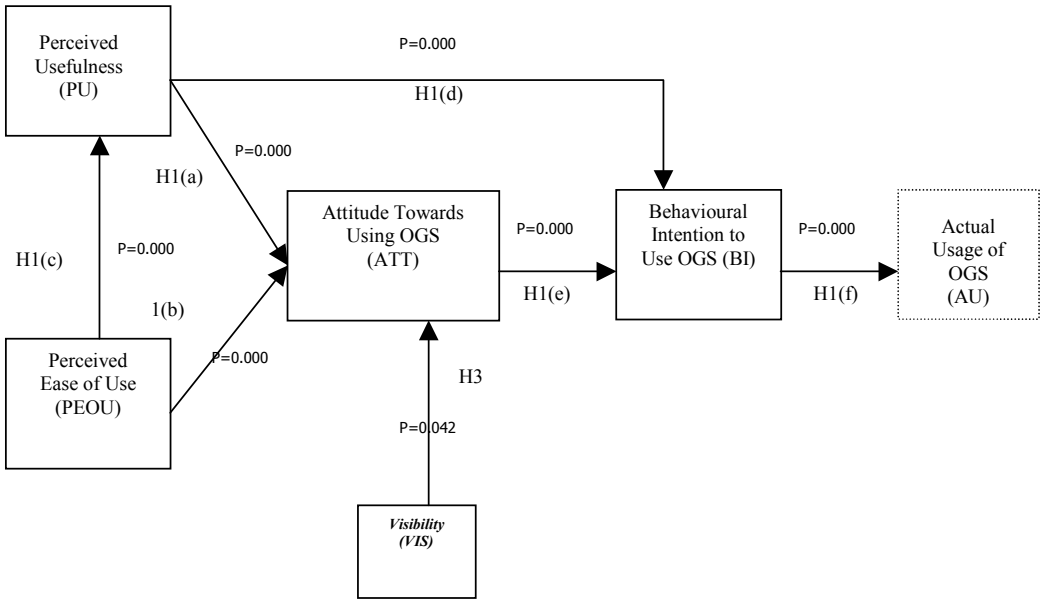

Figure 2: *The Revised Acceptance Model of Online Grocery Shopping*

Further research could be performed on the survey data to discover differences in perception of Online Grocery Shopping by consumers with different genders, age ranges, levels of income or education to obtain a better understanding of the underlying issue. In addition, further study could be carried out by interviewing some grocery consumers with or without experience in Online Grocery Shopping to obtain more in-depth understanding about their perceptions. All this would further enrich the findings of this study. Finally, more studies are still required to assess the applicability of the TAM in various contexts within the B2C electronic commerce. As the number of such studies are still limited, it is difficult to observe whether or not the factor approach, such as the use of the TAM, to technology adoption study in the area of B2C electronic commerce would be adequate. As in the case of the B2B electronic commerce enabled technology adoption study (Johnston and Gregor, 2000; Kurnia and Johnston, 2000), the processual approach might be also required to complement the factor approach in the area of the B2C electronic commerce enabled technology adoption.

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Appendix 1: Questionnaire Items and Their Corrected Item-Total Correlations

Item Code	Item Description	Corrected Item-Total
Perceived Usefulness		
PU_1	Using Online Grocery Shopping can improve my efficiency in purchasing groceries.	0.7397
PU_2	Using Online Grocery Shopping can save me a lot of time.	0.7558
PU_3	Using Online Grocery Shopping can enhance my effectiveness in purchasing groceries.	0.6985
PU_4	Using Online Grocery Shopping can make my grocery shopping easier.	0.7534
PU_5	Using Online Grocery Shopping can increase my productivity.	0.6837
PU_6	Using Online Grocery Shopping can overcome the obstacles for physically disabled people.	0.5104
PU_7	Using Online Grocery Shopping can overcome the obstacles for elderly people.	0.5392
PU_8	Using Online Grocery Shopping is/might be convenient for my grocery shopping.	0.6974
Perceived Ease of Use		
PEOU_1	Online Grocery Shopping is/might be easy-to-use.	0.6460
PEOU_2	It is/might be easy to become skillful at using Online Grocery Shopping.	0.6950
PEOU_3	My interaction with the processes of Online Grocery Shopping is/might be clear and understandable.	0.7434
PEOU_4	It is/might be easy for me to follow the procedures when ordering groceries online.	0.7553
Attitude Towards Using Online Grocery Shopping		
ATT_1	Using Online Grocery Shopping in purchasing groceries is a good idea.	0.7785
ATT_2	Using Online Grocery Shopping in purchasing groceries is/might be pleasant.	0.7693
ATT_3	Using Online Grocery Shopping is/might be beneficial to me.	0.7817
Behavioural Intention to use Online Grocery Shopping		
BI_1	I intend to use Online Grocery Shopping when the service becomes widely available.	0.7660
BI_2	Whenever possible, I intend to use Online Grocery Shopping to purchase groceries.	0.6845
BI_3	I intend to use Online Grocery Shopping when there is free home delivery.	0.7960
BI_4	I intend to use Online Grocery Shopping when the price is competitive.	0.7492
Perceived Risk		
PR_1	I am concerned with the payment security aspects of Online Grocery Shopping.	0.6694
PR_2	I am concerned with the privacy of my information provided when using Online Grocery Shopping.	0.7476
PR_3	I am concerned with the punctuality of the delivery time of Online Grocery Shopping.	0.6291
PR_4	I am concerned with the quality of the products delivered when ordering from Online Grocery Shopping.	0.5423
Visibility		
VIS_1	I have seen others using Online Grocery Shopping.	0.7202
VIS_2	In my organisation/school, one easily sees Online Grocery Shopping being used.	0.6913
VIS_3	I have seen Online Grocery Shopping being used outside my organisation/school.	0.7678
VIS_4	It is easy for me to see others using Online Grocery Shopping in public.	0.7117
Social Influence		
SI_1	I will use Online Grocery Shopping if the service is widely used by people in my community.	0.6222
SI_2	I will adopt Online Grocery Shopping if my boss uses it.	0.5769
SI_3	I will adopt Online Grocery Shopping if my friends/relatives use it.	0.7399