Acceptance Level of Push Technology-based Online Shopping Widget among Malaysians: Application of Technology Acceptance Theory

Lee Yean Hooi[1], Mohd Azam Osman[1, 2], Rosnah Idrus[1, 2], Tan Shiang-Yen[1]

[1]School of Computer Sciences
Universiti Sains Malaysia
11800, Pulau Pinang
MALAYSIA

[2]Center for Marine and Coastal Studies (CEMACS)
Universiti Sains Malaysia
11800, Pulau Pinang
MALAYSIA

lyh82_lyh@hotmail.com, azam@cs.usm.my, rosnah@cs.usm.my, tsy09_com036@student.usm.my

Abstract: - Nowadays, online shopping information such as new product release, promotion, and other news are mostly retrieved manually by prospective buyers from individual website or webpage, which is entailed enormous efforts, time-consuming and often lead to information overload. The tool or method used in this scenario is known as pull-technology. As a solution, this study proposed an online shopping widget which automatically retrieves relevant online shopping information from various sources at single point of time based on the concept of push technology. In relevant to this, the objective of this paper is to investigate the acceptance level of the proposed online shopping widget among Malaysians, through applying technology acceptance theory in questionnaire survey. The findings of this study imply that the overall acceptance level of Malaysians toward the proposed online shopping widget is considered as relatively low. In addition, the result of this study also suggested that perceived usefulness of the sidebar widget is the strongest antecedent which led to the intention of use of the online shopping widget. This study has provided a foundation to both practitioners (e.g. software developers) and academicians for understanding of the acceptance level of similar push technology-based online shopping widget, and the characteristics the online shopping widget (especially usefulness and ease-of-use) should incorporated in order to enhance acceptance level among prospective users.

Key-Words: - Online shopping, Push technology, Technology acceptance theory, Sidebar widget.

1 Introduction

E-commerce has been repositioned as a common trend as well as a part of routine business activity in nowadays business environment, not only exclusive to developed countries, but also in many developing countries. Many traditional business premises begin to change and involve in e-commerce in order to sustain their sales and to compete with competitors around the globe. Without exception to Malaysia, e-commerce activities in Malaysia are in increasing trend. According to The Star Online News on January 2008, increasing numbers of Malaysians begin to adapt, trust, and feel convenient to involve in e-commerce especially in terms of online shopping and e-banking [1].

Despite the pervasiveness of e-commerce, a study done by Wharton School of Business suggested that although total online retail spending is increasing, but online retail spending per person is quickly decline [2]. As postulated by Watabe and Iwasaki, time-saving is one of the factors which strengthen the trend to buy goods at an online shop

[3]. Ironically, most of the information for current online shopping activities reached the prospective buyers through pull technology which is rather inefficient and time-consuming. This is mainly due to the fact that prospective buyers are required to spend considerable amount of time and put in great effort to seek for information of the desired product or service. Hence, it is believed that developing a new method of online shopping by using the push technology which offers prospective buyers a convenient and time-saving method of online shopping will be accepted.

Based on a concept of push technology, an online shopping widget is proposed as a new method to retrieve information for online shopping. The online shopping widget will 'push' information of products and services from more than single website to prospective buyers (users of the online shopping widget) according to the users' predefined product and services of interest and other criteria. This widget aimed to provide a time-saving and convenient way of retrieving information for online shopping products and services.

Nonetheless, the online shopping widget which as a kind of information technology will not result in expected efficiency and effectiveness, if they are not being utilized [4]. Although technology is pervasive in the modem society, not all individuals view the technology as beneficial. Some individuals are uncomfortable with technological change, do not enjoy the uncertainty and are reticent to embrace these tools and ideas whereas others welcome them and enjoy the challenge [5]. As the push technology based online shopping widget is a kind of new information technology, the purpose of this study is to investigate the acceptance level of the Malaysian public on the proposed widget by applying the Technology Acceptance Theory (TAM).

In the next section, a brief description of the online shopping widget and relevant terminologies will be discussed. Section 3 provides an overview of Technology Acceptance Theory from literature reviews. Subsequently, section 4 describes the research model and hypotheses of this study. Furthermore, the methodology of the study is describes in section 5, while descriptive analysis is discusses in section 6. Section 7 discusses data analysis based on data collected. In addition, discussion of the data analysis is included in section 8. Conclusion of this study is included in section 9.

2 Online Shopping Widget Based on Concept of Push Technology

2.1 Push vs. Pull Technologies

Over the last decade, internet has significantly changed the way of business being conducted. The most publicized and fastest growing aspect of the internet is the Worldwide Web [6]. The web is becoming increasingly important as a source of commercial information, news, educational channel, and data from government agencies. Typical internet users "pull" information by requesting from specific or particular webpage. A paradigm for this scenario is where the internet users surf the web or search for relevant information through search engine. This method is not only entailed inefficiency, ineffectiveness, time-consuming, but also result in the users to be overwhelmed by vast amount of irrelevant information, which known as information overload. Fig. 1 indicates the concept of pull technology, which the users need to retrieve the information separately from one single webpage at single point of time.

Fig.1 Pull Technology
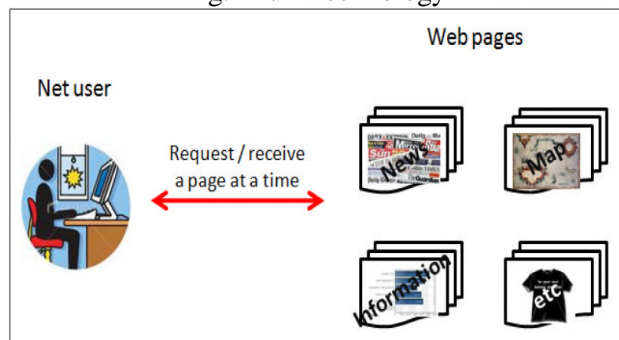
As opposed, push technology implies tools which enable information in order to be sent to users without having them specifically ask for it, or requiring users to explicitly get the information they need. In other words, push technology means automating the delivery of information to end-users' computer through the utilization of internet.

In 1997, push technology was heralded as a new way to retrieve information via user desktop computer. However, due to most people only had dial-up Internet connections at that time and computers were just beginning to get fast enough to run multiple applications simultaneously under Windows, push technology did not take off immediately even through the concepts behind it was good. As a result, push technology faded into the background for a period of time [7]. Today, push technology in its current form is still the same like years ago. With the widespread of broadband network access and Really Simple Syndication (RSS) feeds, anyone with the right equipment has the access to push technology.

The push technology was developed to alleviate problems faced by Internet users, such as information overload and low bandwidth. Information overload is the main reason for the development of push technology. Push technology can help users to manage information by filtering, indexing, and directory services. On the other hand, push technology provides a means of pre-delivery of much larger packages of content consisted of audio, large amount of graphics, or short video clips, which to allow users to access to the overview or featured information of the whole thing just with low internet bandwidth requirement. Fig.2 illustrates the concept of push technology, which there is a data provider who consolidates information from various websites, then disseminate relevant information to the users according to their preferences or predetermined criteria.

Fig.2 Push Technology

Fig. 3 Design Architecture of Proposed Widget
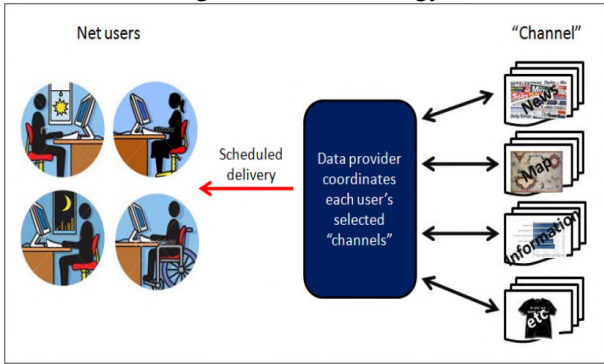
Every time when a person or company updates their websites or post new information, clients who subscribe to the RSS feed will see the updated content and can access for further details. People will no longer have to manually check all the different links on regular basis. The online shopping widget proposed in this paper is built on this concept which customizable online shopping information can be delivered to prospective buyers.

2.2 Online Shopping Widget

The proposed online shopping widget is a method to retrieve information for online shopping products and services based on the concept of push technology. This online shopping widget taking the advantage of Windows Vista feature – Windows Sidebar Widgets. The proposed online shopping widget is a small application operates under Windows Vista Sidebar to offers users a faster, convenient, customizable and easier way of getting information from different vendors at the same time.

One core technology adopted to develop the online shopping widget is the Really Simple Syndication (RSS). RSS is a format for delivering regularly changing web content. It enables users to easily stay informed by automatically retrieving latest content or update from the websites or even particular webpage which chosen by the users.

The subscribed vendors (product or service providers) will only need to update their website whenever they have any new item or information to publish. The information updated will be automatically sent to the users who have subscribed to the vendor channels. In other words, all the latest shopping information and products provided by the vendors will be directly pushed to the users through the online shopping widget. Users can select their preferred vendors or item categories in order to receive relevant information only. Fig.3 illustrates the design architecture of the proposed widget.
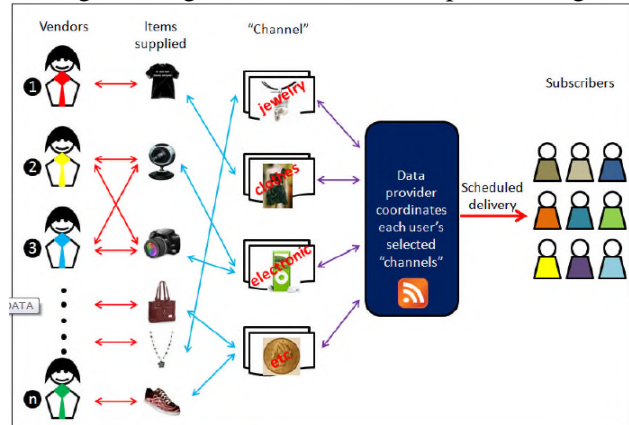
The widget acts only as a communication bridge for the convenience of the users to easily retrieve latest shopping information from their preferable vendors, but not incur any transaction.

The following are the main features of the proposed online shopping widget:

- Display summary of latest shopping information from subscribed vendors
- Customizable preferred item categories
- Customizable preferred vendors
- Attached with direct link to corresponding webpage for further information
- Customizable feed-reload time

There are numbers of advantage can be provided by the proposed online shopping widget. Due to the reason that the widget is built as a Sidebar Widget, it is a lightweight application which require minimal computer resource to support its operations.

In addition, with the RSS technology adopted as a core channel for information input, the widget requires very little volume of data in order to display the intended information. Thus, it will not pressure the users who have limited bandwidth. The proposed widget has a simple but concise graphical user interface as shown in Fig. 4. Every operation can be done by just few simple clicks on mouse.

Fig. 4 User Interface of the Proposed Widget

Lee Yean Hooi, Mohd Azam Osman,
Rosnah Idrus, Tan Shiang-Yen

Table 1 Comparison between Current Online Shopping Method and Proposed Online Shopping Method

Current online shopping method	New online shopping method using widget
● Every time need to visit the e-commerce website. Time wasted when waiting for website loading. ● Must spend time to search for the product. ● Effort wasted if there are no new items or information needed. ● More time and effort needed to search more than one e-commerce website.	● No need to visit any e-commerce website. Information will be retrieved automatically from vendor websites and pushed to user. ● Receive information without affecting user's daily working process. ● No time and effort will be wasted on tiring searching process. ● Users are free customize the category of information to be received

# 3 Technology Acceptance Model (TAM) – Theoretical Background

Technology Acceptance Model (TAM) is a suitable research model as it has been extensively used by information system researchers to study individuals' acceptance of technology and is said to be a strong predictor of intention to use a technology in various organizational and personal situation [8].

TAM is recognized as one of the most influential extensions of Ajzen and Fishbein's Theory of Reasoned Action (TRA). TAM used the TRA as a theoretical basis for specifying the causal linkages between consumers perceived usefulness, perceived ease of use of beliefs and user acceptance and actual usage of particular technology [9].

In other words, the basic TAM describes a logical law of variables in which user behavioral intentions (BI) to use a technology are mediated both by its perceived usefulness (PU) and perceived ease of use (PEOU) [10]. It was developed by Fred Davis and Richard Bagozzi. Davis defined perceived usefulness (PU) as the degree to which a person believes that using a particular system would enhance his or her job performance. Also, Davis defined perceived ease of use (PEOU) as the degree to which a person believes that using a particular system would be free of effort. Apart from that, behavioral intentions (BI) referred to the willingness of an individual to perform certain behaviors [11].

Dependent variable of TAM is actual usage. It has typically been a self-reported measure of time or frequency of employing the application. Fig.5 shows the basic form of Technology Acceptance Model (TAM).

Fig.5 Basic Form of TAM
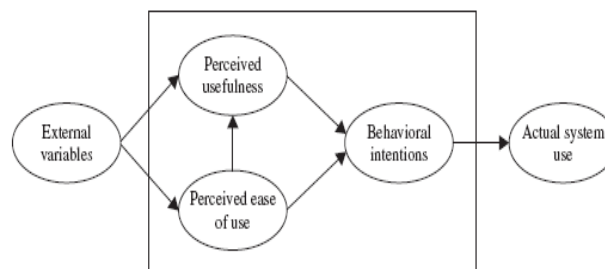
4 Research Model and Hypothesis

Thirty years ago, Bandura pointed out the important role of affect (if individuals like things, they tend to be more willing to learn about them and incorporate them into their live) as an influence on preferences for television media and later found to be an influence on preferences for computer media as well by Compeau and Higgins [12]. Consumers who have more positive feeling towards computer are likely to find them easier to use and more useful than those who have not [13].

In this study, general affinity with computer is adapted in order to address specific affinity with Windows Sidebar Widget. If consumers like widgets, they tend to be more willing to download new widgets and use them in their computers. The premise is that consumers have positive feeling about sidebar widget will influence their willingness to use the online shopping widget.

Hypothesis 1 (H1): Affinity with Windows Sidebar Widget (AW) will positively relate to the perceived usefulness (PU) of the online shopping widget.

Hypothesis 2 (H2): Affinity with Windows Sidebar Widget (AW) will positively relate to the perceived ease of use (PEOU) of the online shopping widget.

Perceived usefulness can be defined as user's awareness on the effectiveness or importance of using a particular system which would enhance job performance. In this research, perceived usefulness is the degree to which using online shopping widget is an effective way for the user to obtain the latest shopping information faster and easier.

Hypothesis 3 (H3): Perceived usefulness (PU) of Windows Sidebar Widget will have positive effect on behavioral intention (BI) to use the online shopping widget.

Perceived ease of use can be defined as user's awareness on using a particular system which would help in the job mitigation. In this study, perceived ease of use is defined as the degree to which the use of online shopping widget is not difficult, convenient and easy to use.

Hypothesis 4 (H4): Perceived ease of use (PEOU) of Windows Sidebar Widget will have positive effect on behavioral intention (BI) to use the online shopping widget.

There were several researches been done through extended TAM by the inclusion of other external variables. These variables included personal characteristic such as gender, age, education, knowledge, innovativeness and experience [14]. The premise is that user behavioral intention (BI) to use Windows Sidebar Widget will have positive effect on purchase intention (PI) of the online shopping widget.

Hypothesis 5 (H5): User behavioral intention (BI) to use Windows Sidebar Widget will have positive effect on purchase intention (PI) of the online shopping widget.

Fig. 6 shows the research model of this study.

Fig. 6 Research Model
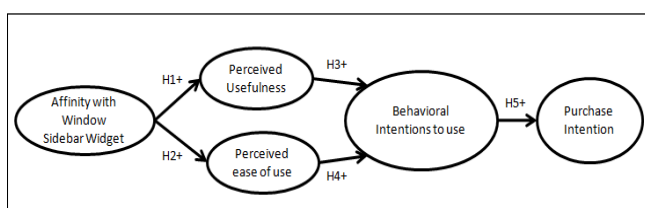
5 Methodology

5.1 Subjects and Procedure
An online survey in the form of questionnaire was developed in order to test the expected relationships. Based on Krishnan (2006), majority of Malaysians interested in e-commerce are males and males below 30 years old is the largest group of Malaysians interested in e-commerce [15]. Therefore, in order to have more respondents in this category, universities were chosen to be the suitable places to conduct the survey. Emails with direct link to the questionnaire survey were sent out to 400 respondents.[16]

Due to time and financial constraints, respondents were selected using convenient sampling. Survey was done on voluntary manner and no incentive was offered to the respondents. In other words, respondents have the right to choose not to participate or to discontinue their participation any time. The survey was conducted over a period of three weeks and sent to 400 respondents. A total of 60 respondents have completed usable questionnaire, which make up a response rate of 15%.

5.2 Instrument Development
The questionnaire contained twenty six questions, divided into four sections. First section contains six questions to capture respondents' demographic information such as gender, age, race, etc. Second section contained nine questions which captured respondents' information about Internet usage and online shopping experiences. Third section contained six questions which captured respondents' information about Windows Vista and widget usage. The last section contains five questions where each question was sub-divided into two to six sub questions. The last part was the most important part in the questionnaire. It measures the consumers' acceptance level of online shopping widget using the following variables: affinity with Windows Sidebar Widget (AW), perceived usefulness (PU), perceived ease of use (PEOU), behavioral intention to use (BI), and purchase intention (PI). All the variables were in seven-point scale (1 = strongly disagree and 7 = strongly agree). Respondents were to answer all the questions in all four parts.

All variables undergo Cronbach's Alpha test and all of the values are higher than 0.6. This implies that all variables are in acceptance level. Therefore all five variables are deemed to be reliable measures.

Lee Yean Hooi, Mohd Azam Osman,
Rosnah Idrus, Tan Shiang-Yen

5.3 Internal Consistency of Variable Items

Cronbach's Alpha is a measure of the inter-correlation of items. It is the estimate of internal consistency of item in a scale, measuring the extent to which item responses obtained at the same time correlate highly with each other. When Alpha equal to zero, it means the true score is not measure at all and there is only error components. On the other hand, Alpha value which equal to 1.0 represents that items measure only the true score and there is no error component [16]. The widely-accepted alpha value in social science is at least 0.7 or higher for a set of items to be considered a scale. Nonetheless, some use 0.75 or 0.8 while others are as lenient as 0.60.

In this survey, four variables are scored high in Alpha value, PU (0.932), PEOU (0.942), BI (0.950), and PI (0.958). AW indicates lower alpha value which is 0.658 compared to the other variables. Since alpha value of all variables are higher than 0.6, this implies that the internal consistency of all variables are acceptable.

6 Demographic and Descriptive Statistics

Table 2 indicates demographic data of respondents, such as age, gender, race, education level, employment status, and annual income.

Table 2 Respondents' Demographic Data

Variable	Categories	Percentage
Age	< 18	0.00
	18-24	25.00
	25-34	66.67
	35-44	8.33
	45-54	0.00
	> 55	0.00
Gender	Male	53.33
	Female	46.67
Race	Malay	16.67
	Chinese	70.00
	Indian	1.67
	Others	11.67
Education Level	High School	6.67
	Diploma	1.67
	Bachelor's Degree	58.33
	Master's Degree	30.00
	Ph.D.	0.00
	Others	3.33
Employment Status	Self employed	5.00
	Salaried employee	60.00
	Unemployed	1.67
	Retired	0.00
	Student	33.33
Annual Income	< RM30,000	58.33
	RM30,000-RM44,999	26.67
	RM45,000-RM59,999	10.00
	> RM60,000	5.00

Table 3 shows internet usage and other online shopping related data of respondents. These variable included tenure and duration internet usage, and online shopping experiences.

The findings implies that the internet penetration rate among Malaysians who under age of 45 is considerable high, which is 98.33 percent. In addition, almost of the respondents spend more than 5 hours per day for internet surfing.

In terms of online shopping experiences, responses from the survey illustrate that Malaysians less likely to shop online, the numbers of online shopping website visited are also limited, and the annually online shopping spending is also very low, where more than half of the respondents spent less than RM100 for the past 12 months.

Table 3 Respondents Internet usage and online shopping data

Variable	Categories	Percentage
Have you used the Internet?	Yes	98.33
	No	1.67
How long have you been using the Internet?	< 6 months	1.67
	6 months – 1 year	1.67
	1 – 2 years	0.00
	2 – 4 years	6.67
	> 4 years	90.00
On average, how many hours you spend per day using the Internet?	< 1 hour	11.67
	1 – 3 hours	20.00
	3 – 5 hours	20.00
	> 5 hours	48.33
Have you shopped for any products or services using the Internet?	Yes	63.33
	No	36.67
Over the past 12 months, approximately how many times have you shopped for products or services using the Internet?	0	40.00
	1 – 3	41.67
	4 – 6	5.00
	7 – 9	5.00
	> 10	8.33
Over the past 12 months, approximately how much have you spent on the purchases using the Internet?	< RM100	55.00
	RM101 – RM200	13.33
	RM201 – RM300	10.00
	RM301 – RM400	10.00
	RM401 – RM500	5.00
	> RM501	
Over the past 12 months, approximately how many Internet sites have you used for shopping?	0	38.33
	1 – 3	46.67
	4 – 6	8.33
	7 – 9	1.67
	10 – 12	1.67
	> 13	3.33
Approximately how much time will you need to search for a product or services (online shopping)	< 30 minutes	36.67
	30 mins – 1 hour	28.33
	1 – 2 hours	11.67
	> 2 hours	23.33
In general, are you comfortable with current online shopping practice? (Comfortable in the context of searching effort and time spent on the online shopping.)	Yes	53.33
	No	46.67

Table 4 illustrates data of respondents' usage on Windows Vista and its sidebar widget.

Table 4 Respondents Windows Vista and widgets usage data

Variable	Categories	Percentage
Have you used Windows Vista?	Yes	60.00
	No	40.00
How long have you been using Windows Vista?	< 6 months	63.33
	6 months – 1 year	25.00
	1 – 2 years	10.00
	> 2 years	1.67
Have you used Windows Vista feature – Sidebar Widget?	Yes	41.67
	No	58.33
In general, have you downloaded any sidebar widget from the Internet for your own use?	Yes	26.67
	No	73.33
Over the past 12 months, how many sidebar widgets have you downloaded from the Internet for your own use?	0	73.33
	1 – 3	11.67
	4 – 6	13.33
	7 – 9	1.67
	> 10	0.00
If there is a sidebar widget which will provides you the latest shopping information you needed, will you use it?	Yes	25.00
	No	13.33
	May consider based on other factors	61.67

Based on the respondents' responses on Window Vista and widget usage, the figures implies that although Window Vista has considerable penetration rate with 60 percent, the users who actually utilize the Sidebar Widget is only 41.67 percent. Apart from that, the findings also indicate that the Sidebar Widget users, who have downloaded additional widgets, are only comprised of 26.67 percent of the population. This implies that the respondents have very low exposure to Sidebar widget, and might also not familiar with the operations of Sidebar Widgets.

Another important finding shown in table 4 is the acceptance level of the proposed online shopping widget among the respondents. The result suggested that only 25 percent of the respondents will certainly use the online shopping widget.

7 Data Analysis

Hypotheses of this survey were tested using correlation and regression analysis.

7.1 Correlation Analysis

Table 5 shows all the correlation values among all the variables. The significant levels should be below 0.05, which means that there is only 5% probability that the independent variable does not influence the dependent variable in the reported fashion.

Table 5 Matrix of Correlations

	AW	PEOU	PU	BI	PI
AW	1.0	.547**	.745**	.637**	.531**
		.000	.000	.000	.000
PEOU	.547**	1.0	.749**	.801**	.274*
	.000		.000	.000	.034
PU	.745**	.749**	1.0	.838**	.613**
	.000	.000		.000	.000
BI	.637**	.801**	.838**	1.0	.531**
	.000	.000	.000		.000
PI	.531**	.274*	.613**	.531**	1.0
	.000	.034	.000	.000	

* Correlation is significant at the 0.05 level (2-tailed).

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

R-Square value in table 6 implies that all dependent variables are positively related to the independent variables. The value of R-Square ranged from 1 to -1. The absolute value of R indicates the strength with larger absolute values indicating stronger relationship [17].

In addition, adjusted R-Square is generally considered to be a more accurate goodness-of-fit measure than R-Square, which measure the proportion of the variation in the dependent variables accounted for by the explanatory variables [17]. The

Table 6 Regression Analysis

Dependent variable	AW	AW	PU	PEOU	BI
Independent variable	PU	PEOU	BI	BI	PI
R-Square	0.555	0.300	0.703	0.642	0.282
Adjusted R-Square	0.547	0.288	0.698	0.636	0.269
F-Statistic	72.281	24.825	137.070	104.167	22.756
Significance, p	0.000	0.000	0.000	0.000	0.000
Coefficient Beta	0.745	0.547	0.838	0.801	0.531
Durbin-Watson	1.861	1.896	1.682	1.735	1.829

rough interpretation of adjusted R-Square is – if the value is 0.250, then it implies that 25 percent of the variation in the dependent variable can be explained by the variation in the impendent variables.

Hence, Adjusted R-Square values from the finding suggesting that at least 26% of the variation in the dependent variables can be explained by variation in the independent variables.

From all the five hypotheses made earlier, H3 (perceived usefulness of Windows Sidebar Widgets will have positive effect on behavioral intention to use the online shopping widget) is strongly supported due to the highest R-Square value of 0.703. H4 (perceived ease of use of Windows Sidebar Widgets will have positive effect on behavioral intention to use the online shopping widget) is also strongly supported by the R-Square value of 0.642. Positive relationship between dependent variable – behavioral intention to use (BI), and independent variable - intention to purchase (PI), of H5 is the weakest due to the R-Square value of only 0.282.

Five Coefficient Beta values in table 6 are standardized regression coefficients used to compare the contribution of the explanation of the variance of the dependent variables within the model. The standardized coefficients are an attempt to make the regression coefficients more comparable. Therefore, H3 still has the highest value of Coefficient Beta 0.838, followed by H4 with 0.801. H1 is in third place compared to the other hypotheses with Coefficient Beta of 0.745. Relationship between dependent variable (AW) and independent variable (PEOU) of H2 with the Coefficient Beta value of 0.547 is slightly higher than H5.

Durbin-Watson test is a statistic test used to detect the presence of autocorrlation in the residuals from a regression analysis. The value of Durbin Watson test ranged from 0 (in the case of serial correlation of +1) to 4 (in the case of serial correlation of -1). If the regression has no serial correlation, then the regression residuals will be uncorrelated through time and the value of Durbin-Watson test will be equal to 2. In the case which the regression residuals are positively correlated, the Durbin-Watson value will be less than 2, while in the case which regression residuals are negatively serially correlated, the value of Durbin-Watson will be greater than 2 [17].

According to findings shown in table 6, all five hypotheses are with Durbin-Watson value less than 2. It means the regression residuals for all five hypotheses are positively serially correlated and have no problem of autocorrelation. In other words, the analysis satisfies the assumption of independence of errors.

The results in Table 5 and 6 support all five research hypotheses. Affinity with Windows Sidebar Widget is strongly correlated to perceive of usefulness and it is statistically significant ($r = 0.745$, $p = 0.000$). Also, affinity with Windows Sidebar Widget is positively correlated to perceive ease of use ($r = 0.547$, $p = 0.000$). In addition, table 4 implies that perceive of usefulness has the strongest relationship with the behavioral intention to use ($r = 0.838$, $p = 0.000$). Perceived ease of use also has strong positive correlation relationship with the behavioral intention to use ($r = 0.801$, $p = 520.000$). Behavioral intention to use is positively correlated to purchase intention as well ($r = 0.531$, $p = 0.000$). Table 7 shows the summary of hypothesis testing in an organized manner.

8 Discussion

Based on the survey findings, there are only 42% of the respondents have experience in using Windows Vista widget. Apart from that, only 27% of respondents have download sidebar widget from the Internet for their own use. 25% of respondents show positive reaction on the willingness of using online shopping sidebar widget which provides them with

Table 7 Summary of Hypotheses Testing		
Hypotheses	**Result**	**Significance, p**
H1: Affinity with Window Sidebar Widget (AW) will positively relate to the perceived usefulness (PU) of the PSG-S1 widget.	Support	0.000
H2: Affinity with Window Sidebar Widget (AW) will positively relate to the perceived ease of use (PEOU) of the PSG-S1 widget.	Support	0.000
H3: Perceived usefulness (PU) of Window Sidebar Widget will have positive effect on behavioral intention (BI) to use the PSG-S1 widget.	Support	0.000
H4: Perceived ease of use (PEOU) of Window Sidebar Widget will have positive effect on behavioral intention (BI) to use the PSG-S1 widget.	Support	0.000
H5: User behavioral intention (BI) to use Window Sidebar Widget will have positive effect on purchase intention (PI) of the PSG-S1 widget.	Support	0.000

the latest shopping information they need.

In this study, consumer acceptance level of online shopping widget is divided into 3 levels which are high, medium and low. Based on the findings, it can be concluded that consumer acceptance level of online shopping widget is low due to the fact that the respondents in this study seldom use Windows Sidebar Widgets. Furthermore, respondents rarely search and download widgets from the internet. These entire scenarios imply that the awareness and usage of Windows Vista Sidebar widgets are relatively low among the respondents. In relevant to this, the respondents are more likely to be not familiar with the operations of Sidebar Widget. They might also perceive the Sidebar Widget as a tool which is not useful, not beneficial, and not significant in improving their performance. As a matter of fact, the proposed online shopping widget is built as a widget operating under the Sidebar Widget environment. Thus, it is not uncommon that the respondents will perceive the proposed online shopping widget as an unfamiliar, complex tool. In addition, due to the fact that the respondents do not have much experience of using the Sidebar Widget, they might also perceive the proposed online shopping widget as a challenge, as they need to spend time and effort to learn and familiarize with the tool.

The relatively low awareness and usage of Window Sidebar Widgets may due to the reason that the tools or applications are only available for Windows Vista (an operating system developed by Microsoft). In relevant of this, the Sidebar Widgets are not available for other operating systems such as Linux. Therefore, consumers who used other operating system are not aware of the widgets or not accessible to the tool. At the time of research being conducted, most of the users still remain on using Window XP (an ancestor of Window Vista) because of Window Vista puts high demands on computer resources, such as computing power, graphical processing capability, RAM (random access memory) and also other hardware supports. Therefore, the infamous of Window Vista at the time might directly impacts the perceived usefulness and user friendliness of the proposed online shopping widget, which is a small application built to run under the Window Vista environment. Nonetheless, with the pervasiveness of computer hardware which designed to support latest operating system such as Window Vista and the release of Window 7, there will be more users have the accessibility to the Window Sidebar Widgets, therefore might indirectly enhance the acceptance level of the proposed online shopping widget.

Nevertheless, respondents in this study have demonstrated a positive behavioral intention to use the online shopping widget. The findings of this study imply that consumer behavioral intention to use the online shopping widget was positively related to perceived usefulness and perceived ease of use of the system. Therefore, it is believed that widget with effective and user friendly features will be favored by the consumers and enhance the utilization of the online shopping widget. In order to enhance the user friendliness of the proposed online shopping widget, the authors suggested enabling of the widget to display short video clips and sound files, instead of static text and images. Furthermore, the findings from this study imply that usefulness of Windows Sidebar widget have the strongest positive effect on the intention of use the online shopping widget. Therefore, online shopping widget will subject to higher acceptance level with useful features in it. In relevant to this, the authors suggested enabling of a bidirectional communication between the prospective customers and the vendors, through the online shopping widget.

10 Conclusion

It is worthy to note that this study is subjected to certain limitations. First, the population sampled in this study is only focus a small part of Malaysian population. It is because the survey was done in the form of voluntary and without any incentives. Besides, the survey is in online form. Therefore, population was limited to those with Internet access. Moreover, as the study used convenient sampling, the respondents may not be representative of the chosen population. The non-respondents may have different attitude from the respondents. It is believed that a better marketing survey can be done by offering incentive to the respondents. Respondents will take the survey more seriously and respond honestly. Also, with bigger survey sample size, the result will be more accurate and representative.

Nonetheless, this study provides information on Malaysian attitude and acceptance toward push technology-based online shopping widget for both practitioners and academicians. The findings also implies the characteristics (e.g. useful features and user friendly interface) of the online shopping widget which able to receive better acceptance from Malaysian users. This initial research also provides a foundation for future research which can include more variables in order to study the acceptance level of similar kind of online shopping widget in a more comprehensive manner. Furthermore, the future

research can implement the method in mobile computing area.

References

[1] (2008, 27 November). *E-payments Gaining Popularity* Available: http://startechcentral.com/tech/story.asp?file=/2008/1/1/technology/19850887&sec=technology

[2] M. Pastore. (2000, *Online Consumer Spending Growth Slowing*. Available: http://cyberatlas.internet.com/markets/retailing/article/0,,6061_271961,00.html

[3] K. Watabe and K. Iwasaki, "Factors affecting consumer decisions about purchases at online shops and stores," p. 88, 2007.

[4] R. Agarwal and J. Prasad, "Are individual differences germane to the acceptance of new technologies?," *Decision Sciences,* vol. 30, pp. 361-391, 1999.

[5] S. W. Edison and G. L. Geisller, "Measuring attitudes towards general technology: Antecedents, hypotheses and scale development," *Journal of targeting, Measurement and Analysis for Marketing,* vol. 12, pp. 137-156, 2003.

[6] W. Kenneth, "What is Push Technology ?," *California Research Bureau Note,* vol. 4, pp. 1-18, 1997.

[7] U. Sandhills Publishing Company, "Push Technology Take Your Mobile Experience to the Next Level," *Featured Articles April 2006,* vol. 4, pp. 51-53, 2006.

[8] F. D. Davis, "User acceptance of information technology: system characteristics, user perceptions and behavioral impacts," *International Journal of Man-Machine Studies,* vol. 38, pp. 475-487, 1993.

[9] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly: Management Information Systems,* vol. 13, pp. 319-339, 1989.

[10] B. B. Stem*, et al.*, "Consumer acceptance of online auctions: An extension and revision of the TAM," *Psychology and Marketing,* vol. 25, pp. 619-636, 2008.

[11] C. Pang and X. Ji, "An empirical study on predicting user purchase intention on the creative product: A case of apparel," p. 608, 2008.

[12] D. R. Compeau and C. A. Higgins, "Computer self-efficacy: Development of a measure and initial test," *MIS Quarterly: Management Information Systems,* vol. 19, pp. 189-210, 1995.

[13] C. A. Scott and R. F. Yalch, "Consumer response to initial product trial: A Bayesian analysis," *Journal of Consumer Research,* vol. 7, pp. 32-41, 1980.

[14] K. C. C. Yang, "Exploring factors affecting the adoption of mobile commerce in Singapore," *Telematics and Informatics,* vol. 22, pp. 257-277, 2005.

[15] G. Krishnan. (2006, 27 November). *Internet marketing exposure in Malaysia* Available: http://www.gobalakrishnan.com/2006/12/malaysia-internet-marketing/

[16] J. A. Gliem and R. R. Gliem, "Calculating, Interpreting, And Reporting Cronbach's Alpha Reliability Coefficient For Likert-Type Scales," *Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education,* 2003.

[17] D. C. Montgomery*, et al.*, *Introduction to Linear Regression Analysis.* New York, 2001.