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THE MODERATING ROLE OF UTILITARIAN/HEDONIC USER MOTIVATION ON USER BEHAVIOR TOWARDS WEB 2.0 APPLICATIONS

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Abstract

Web 2.0 is now an important internet application because of the integration of social interaction and web technologies. Previous information system studies usually specified their research context as a utilitarian system or hedonic system and the results were concluded within one specific system type. Web 2.0 application provides a flexible environment for different kinds of user motivations that can be used for utilitarian or hedonic purpose. This study extended the Technology Acceptance Model (TAM) by introducing a moderating factor into the model, in order to study users' behavioral intentions in a Web 2.0 environment. We designed two task types of user motivation and conducted our experiment on two Web 2.0 websites. According to the PLS (Partial Least Squares) analysis, this study demonstrated that utilitarian and hedonic purposes had a moderating effect on the relationship between perceived belief and user attitude as well as the relationship between perceived information quality and perceived belief in the Web 2.0 application. The relationship between perceived usefulness and attitude was stronger in the utilitarian user motivation; whereas the relationship between perceived ease of use and attitude was stronger when the user had hedonic motivation to use the Web 2.0 application. We also found that perceived information quality had significant impact on the perceived usefulness and perceived ease of use.

Keywords: moderating effect, utilitarian/hedonic user motivation, perceived web quality, technology acceptance model (TAM), web 2.0 application

1   INTRODUCTION

With the rapid development of internet technology, numerous web applications have become available to internet users over the past decade. Web 2.0 is one innovative web application that provides an environment for human social interaction as well as information sharing. Based on the core spirit of Web 2.0: 'participation', many kinds of applications such as blogs (i.e. Weblogs), folksonomies, wikis, etc., have emerged to satisfy various user needs. The user studies related to Web 2.0 application have grown quickly during these years. However, most of them only choose one specific type of Web 2.0 applications and seldom discuss the user motivation influences while they use the Web 2.0 application (Hsu & Lin 2008). For this reason, this study chooses two types of Web 2.0 applications and designs two types of user motivations to examine the user behavior in Web 2.0 applications.

The Technology Acceptance Model (TAM) is widely recognized within the information system (IS) research field as a useful model for exploring user attitude and intention toward an information system. Many studies have included other factors into TAM (such as: subjective norm, output quality, intrinsic/extrinsic motivation, etc.) to provide different perspectives as well as to enhance the explanatory power of user behaviour (Davis et al. 1992, Jarvenpaa & Todd 1997, Venkatesh 2000, Venkatesh & Davis 2000, Shang et al. 2005). Other studies have explored the effect of the moderating factor on user acceptance of information system (e.g. experience, voluntariness, etc.) (Castañeda et al. 2007, Jarvenpaa & Todd 1997). The user motivations studies in the IS field usually viewed user motivations as determinants of user perceived belief, and divided user motivations into intrinsic and extrinsic motivation. In many studies, the TAM model was applied to the internet environment in order to examine the user acceptance of internet applications (Jarvenpaa & Todd 1997, Moon & Kim 2001, Shang et al. 2005). Related researches also considered other important factors in internet application, to enhance the explanatory power related to user behavior (Jarvenpaa & Todd 1997, Dishaw & Strong 1999, Venkatesh & Davis 2000, Shang et al. 2005, Hsu & Lin 2008). For example, the user's perception of web quality is now recognized as a factor that influences the user's perceived belief regarding the internet application (Lin & Lu 2000, Liu & Arnett 2000, Moon & Kim 2001, Cao et al. 2005, Éthier et al. 2006). In the internet environment, a user might use one web application for utilitarian or hedonic purpose and these goals might moderate the user's acceptance of these applications (Childers et al. 2001). Web 2.0 applications have a special characteristic that can be used for utilitarian or hedonic motivation, providing the possible extension to explore user motivation from a different perspective. Our research model, based on TAM, will include the perceived web quality factor to explore the moderating influence of utilitarian/hedonic user motivations in Web 2.0 application.

In this paper, we propose a model that combines the perceived web quality factor with the TAM model to examine the moderating effect of utilitarian/hedonic user motivations on the user acceptance of Web 2.0 application. We designed four experimental tasks based on two user motivations (i.e., utilitarian and

hedonic motivation) and two web 2.0 applications (i.e., video share and blog websites) for participants to collect self-report questionnaire data. This study used SmartPLS 2.0 to analyze the experimental data and provided some implications for the development of the Web 2.0 application.

2   RESEARCH MODEL AND HYPOTHESES

The moderating role of utilitarian/hedonic user motivations in the context of the Web 2.0 application has never been studied thus far. Our model, based on TAM, assumes that utilitarian/hedonic user motivations will moderate the relationship between users' perceived belief and attitude, as well as the relationship between users' perceived web quality and perceived belief. Figure 1 shows our proposed model. The following parts will describe the hypotheses.
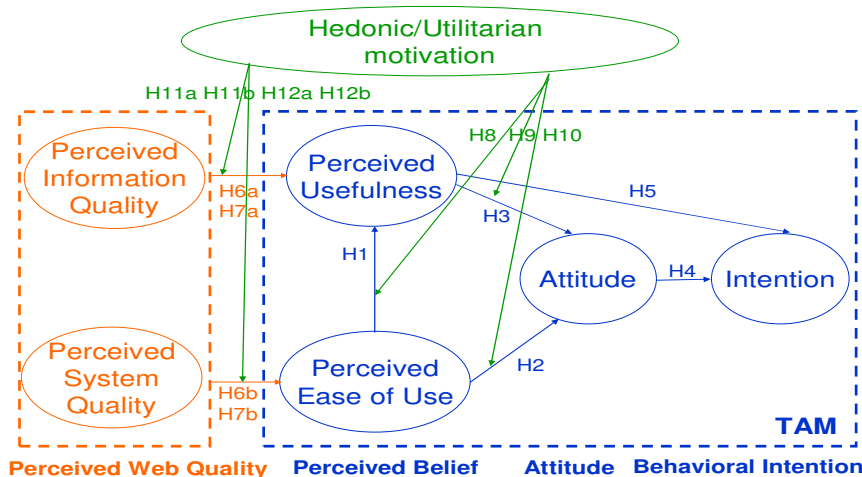

Figure 1. Theoretical Model

2.1   Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) proposed by Davis (1989) attempted to explain and predict user acceptance of IS and posited that user acceptance can be determined by user behavioral intention. The intention is determined by user attitude and the user's perceived usefulness regarding the IS. User attitude is determined by two salient beliefs: perceived usefulness (PU) and perceived ease of use (PEOU). Furthermore, perceived ease of use is a determinant of perceived usefulness. These relationships in TAM have been examined in many related studies (Davis 1989, Venkatesh & Davis 1996, Venkatesh & Davis 2000). TAM is now widely used to predict the acceptance of new technology applications, such as new information systems, new web applications, and mobile services, etc (Lin & Lu 2000, Cao et al. 2005, Ahn et al. 2007, Hsu & Lin 2008). Many scholars extended the TAM model by introducing more variables to enhance the explanatory power of TAM (Dishaw & Strong 1999, Venkatesh & Davis 2000, Shang et al. 2005, Ahn et al. 2007). The purpose of this study is to extend

TAM model by including perceived web quality as the determinants of perceived belief, and examine the moderating role of utilitarian/hedonic user motivations, and consequently, we only revalidated the original relationships in TAM model in the Web 2.0 application. These hypotheses are:

H1: Perceived ease of use has a positive effect on perceived usefulness in the Web 2.0 applications.

H2: Perceived ease of use has a positive effect on user attitude in the Web 2.0 applications.

H3: Perceived usefulness has a positive effect on user attitude in the Web 2.0 applications.

H4: User attitude has a positive effect on user behavioral intention in the Web 2.0 applications.

H5: Perceived usefulness has a positive effect on user behavioral intention in the Web 2.0 applications.

2.2   Perceived web quality

Delone and Mclean (1992) proposed a model using information and system quality to evaluate the success of an information system. Information quality captures the users' perceived value of the output produced by a system and can be measured by information accuracy, relevance, timeliness, and completeness etc (Negash et al. 2003, Éthier et al. 2006). System quality is a measure of the functionality of a system including: usability, availability, reliability, and response time, etc (Delone & Mclean 1992, Negash et al. 2003, Cao et al. 2005). A service quality component was added to enhance customer service settings in later studies (Kettinger & Lee 1994, Pitt & Watson & Kavan 1995). Service quality measures how well the delivered service matched the customer expectations (Cao et al. 2005, Ahn et al. 2007). In recent years, many researches have explored the perceived web quality impact on user acceptance in the context of web applications (Cao et al. 2005, Éthier et al. 2006, Ahn et al. 2007). Most of them categorized perceived web quality into: information, system, and service quality; they showed that perceived web quality had a positive impact on perceived belief (Lin & Lu 2000, Liu & Arnett 2000, Moon & Kim 2001, Cao et al. 2005, Éthier et al. 2006). This study primarily focuses on the moderating effect of utilitarian/hedonic user motivations on user behavior by conducting four experiments. We will not examine the service quality component of perceived web quality. The perceived web quality impact on user perceived belief will be examined with the following hypotheses:

H6a: Perceived information quality has a positive effect on perceived usefulness (PU) in regard to Web 2.0 applications.

H6b: Perceived information quality has a positive effect on perceived ease of use (PEOU) in regard to Web 2.0 applications.

H7a: Perceived system quality has a positive effect on perceived usefulness (PU) in regard to Web 2.0 applications.

H7b: Perceived system quality has a positive effect on perceived ease of use (PEOU) in regard to Web 2.0 applications.

2.3   Utilitarian/Hedonic user motivations

Many traditional information system studies are under the research context of utilitarian system type. Some scholars have argued that the results of IS user behavior studies might differ when the system types are different. Van der Heijden (2004), for instance, validated the technology acceptance model from the hedonic system perspective. The distinction of hedonic/utilitarian systems is derived from the utilitarian and hedonic products concept of consumer behavior literature (Hirschman & Holbrook 1982, Holbrook & Hirschman 1982, Van der Heijden 2004). The consumer behavior studies showed that the utilitarian or hedonic nature of the product determined the intention to consume (Babin et al. 1994). Some studies in the marketing field also find that the utilitarian or hedonic shopping purposes influence consumer shopping behavior (Chitturi et al. 2008, Kim & Shim 2002).

In the IS field, much research has explored the impact of user motivations on user behavioral intention by defining user motivations as intrinsic or extrinsic (Davis et al. 1992, Venkatesh 2000). Beyond the traditional IS research, user motivations are also discussed in the context of internet application. Some studies defined two types (i.e., specific task and general task) of motivation to observe user search behavior (Kim & Allen 2002, Kim 2008). Other studies examined the user online shopping behavior and included the utilitarian/hedonic motivation factors of consumer consumption behavior that are widely used in the marketing field (Childers et al. 2001). Our study adopted the utilitarian/hedonic perspective that the Web 2.0 application could satisfy users with both utilitarian and hedonic purposes; therefore, this study designed the experimental tasks from just such a perspective. We assumed that the determining strength of perceived usefulness (PU) and perceived ease of use (PEOU) on user attitude would be different when the user had a different motivation. We also proposed that the strength of the relationship between perceived web quality and perceived belief will differ according to the utilitarian/hedonic user motivations. The moderating effect of user motivations on user attitude will be examined with the following hypotheses:

H8: The relationship between perceived ease of use and perceived usefulness is stronger in hedonic motivation than in utilitarian motivation.

H9: The relationship between perceived ease of use and user attitude is stronger in hedonic motivation than in utilitarian motivation.

H10: The relationship between perceived usefulness and user attitude is stronger in utilitarian motivation than in hedonic motivation.

H11a: The relationship between perceived information quality and perceived usefulness is stronger in utilitarian motivation than in hedonic motivation.

H11b: The relationship between perceived information quality and perceived ease of use is stronger in hedonic motivation than in utilitarian motivation.

H12a: The relationship between perceived system quality and perceived usefulness is stronger in utilitarian motivation than in hedonic motivation.

H12b: The relationship between perceived system quality and perceived ease of use is stronger in hedonic motivation than in utilitarian motivation.

3 RESEARCH METHOD

3.1 Research variables

There are three kinds of research variables in this study: (1) TAM related factors, (2) perceived web quality, and (3) utilitarian/hedonic user motivations. The TAM related measures (i.e., user behavioral intention, attitude, perceived usefulness, and perceived ease of use) were adapted from the original TAM and the updated TAM model, TAM2 (Davis 1989, Venkatesh 2000). The measure items of perceived web quality (i.e., information quality and system quality) were derived from prior studies that had been widely validated in related studies (Cao et al. 2005, Éthier et al. 2006, Ahn et al. 2007). The wordings of these measure items were slightly modified to fit the Web 2.0 application environment. A seven-point Likert type scale was adopted with anchors ranging from strongly disagree (1) to strongly agree (7). As for the utilitarian/hedonic user motivation, it was the control variable that we assigned with different types of experimental tasks to the participants of this research.

3.2 Experiment design

To examine the moderating role of user motivation, this study designed two types of experimental tasks: (1) utilitarian user motivation, and (2) hedonic user motivation. This study defines the utilitarian task as finding the information that the participants want to know related to their work tasks or school courses. On the other hand, the hedonic task is defined as finding the information in which the participants are interested in their own life, for example hobbies, leisure activities, etc. The participants were asked to define two subjects regarding the experimental task type that they are assigned and search information that they wanted to obtain in the Web 2.0 application. This study chose two Web 2.0 websites for the experimental environment setting. The first is a worldwide video share website (called Website A in the following parts), which allows users to easily upload and share video clips across the internet through websites, mobile devices, blogs, and email. The second is a famous blog website (called Website B in the following parts), which provides an easy way for general internet users to publish material of any topic that they choose to share or discuss. This blog website also provides functions to share photos, pictures, and videos etc. With the combination of the two user motivations and the two Web 2.0 websites, four types of experimental tasks emerge. The experiments were conducted in computer laboratories with twenty minutes allowed for each task. The participants were

randomly divided into four groups and were asked to complete the online questionnaire immediately after finishing their experimental tasks.

3.3 Data collection

Data were gathered from students registered in eight business courses in the business school at a university in Taiwan. Of the 408 questionnaires collected, 366 completed and valid surveys were received. According to the four types of experimental task, 102 valid responses were obtained from the utilitarian task experiment and 92 valid responses were collected from the hedonic task experiment in Website A. 88 valid responses were obtained from the utilitarian task experiment and 84 valid responses were collected from the hedonic task experiment in Website B. Among the usable respondents, 71.6% were part-time students who had weekday jobs and 49.7% were male. 48.1% of the participants were between 18 and 25 years of age. Participants in this research frequently used internet applications with which they connected to the internet on average more than three hours each day. 76.8% of the participants had more than six years of internet experience.

4 DATA ANALYSIS AND RESULTS

Partial least squares (PLS) was applied to test our research model using SmartPLS 2.0. PLS is appropriate for exploratory research because it is more prediction-oriented than other structural equation modelling tools (Éthier et al. 2006). Data analysis proceeded in two stages (Anderson & Gerbing 1988). First, the measurement model was evaluated using confirmatory factor analysis (CFA) to validate the reliability and validity of the constructs. Next, the structural model was estimated using hypotheses testing to test the significance of the path coefficients. Our research model was evaluated with three groups of sample data: (1) the sub-sample of the utilitarian experimental task, (2) the sub-sample of the hedonic experimental task, and (3) the full sample.

4.1 Measurement model

The adequacy of our measurement model was evaluated on the criteria of composite reliability, convergent validity, and discriminant validity. Table 1 shows the analysis results of our measurement model. The composite reliability values ranged from .909 to .970, well above the suggested criteria of .7 (Fornell & Larcker 1981), indicating a commonly acceptable level for confirmatory research. Convergent validity was assessed by the average variance extracted (AVE) for each construct, which should exceed the variance due to measurement error for that construct. The AVE of each construct ranged from .590 to .924, exceeding the acceptable value of 0.5 (Fornell & Larcker 1981). Discriminant validity examines the uniqueness degree of item measures in defining a construct (Gefen 2003). The satisfactory discriminant validity is achieved when the square root of AVE for each construct exceeds all correlations between that and other constructs (Fornell & Larcker 1981). As shown in Table 1, our

evaluation of discriminant validity was acceptable. The analysis result in this stage showed that the measurements in our study were reliable and valid.

Measures[a]	Items	CR[b]	AVE	R^2	Correlation of constructs [a]					
Utilitarian model					PIQ	PSQ	PU	PEOU	Attitude	Intention
PIQ	7	0.962	0.785		**0.886**					
PSQ	7	0.909	0.591		0.628	**0.769**				
PU	4	0.970	0.892	0.627	0.748	0.589	**0.944**			
PEOU	5	0.925	0.713	0.476	0.627	0.618	0.665	**0.844**		
Attitude	2	0.948	0.902	0.640	0.716	0.624	0.791	0.617	**0.950**	
Intention	4	0.959	0.854	0.627	0.632	0.624	0.685	0..522	0.855	**0.924**
Hedonic model					PIQ	PSQ	PU	PEOU	Attitude	Intention
PIQ	7	0.954	0.750		**0.866**					
PSQ	7	0.909	0.590		0.608	**0.768**				
PU	4	0.964	0.871	0.661	0.653	0.592	**0.933**			
PEOU	5	0.954	0.804	0.397	0.557	0.572	0.760	**0.897**		
Attitude	2	0.961	0.924	0.549	0.622	0.534	0.727	0.646	**0.961**	
Intention	4	0.946	0.815	0.662	0.542	0.483	0.706	0.638	0.791	**0.903**
Full model					PIQ	PSQ	PU	PEOU	Attitude	Intention
PIQ	7	0.959	0.772		**0.879**					
PSQ	7	0.909	0.591		0.621	**0.769**				
PU	4	0.970	0.891	0.642	0.709	0.583	**0.943**			
PEOU	5	0.941	0.762	0.444	0.601	0.598	0.721	**0.873**		
Attitude	2	0.957	0.917	0.623	0.682	0.581	0.780	0.645	**0.958**	
Intention	4	0.955	0.841	0.647	0.603	0.486	0.702	0.585	0.793	**0.917**

Table 1 Reliabilities, Convergent validity, and Discriminant Validity

Notes: [a]: PIQ is "perceived information quality"; PSQ is "perceived system quality"; PU is "perceived usefulness"; PEOU is "perceived ease of use". [b]: CR is "composite reliability". [c]: Diagonal elements in the "correlation of constructs" matrix are the square root of the average variance extracted.

4.2   Structural model

To test the hypotheses, the bootstrapping technique was used to produce the t-value and test the significance of the path coefficients. The results of hypotheses testing are presented in Table 2.

- TAM related hypotheses were all confirmed (H1, H2, H3, H4, and H5). With the exception of the positive relationship between perceived usefulness and user intention (H5) could not be found in utilitarian user motivation.

- The positive relationship between perceived information quality and the user perceived belief were all supported (H6a and H6b).
- H7a was not supported, which meant that the perceived system quality did not have a positive effect on perceived usefulness. On the other hand, H7b was supported, which meant that the perceived system quality had a positive effect on perceived ease of use.
- H8, H9, and H10 proposed that the relationship strength between perceived belief and user attitude will different when users has different motivations. They were all supported. The relationships between perceived ease of use and perceived usefulness and user attitude were stronger in hedonic motivation (.538, .220) than in utilitarian motivation (.290, .164). However, the relationship between perceived usefulness and user attitude was stronger in utilitarian motivation (.682) than in hedonic motivation (.559).
- H11a and H11b examined the relationship strength between perceived information quality and perceived belief. Only H11a was supported: the perceived information quality had a stronger relationship with perceived usefulness in utilitarian motivation (.509) than in hedonic motivation (.287). H11b was not supported: the relationship between perceived information quality and perceived ease of use had no obvious difference (.395 versus .332).
- H12a and H12b examined the relationship strength between perceived system quality and perceived belief. They were all rejected. According to the original hypothesis, H7a was rejected: the perceived system quality had no significant effect on perceived ease of use. H12a was supposed not to be supported.

Path	Utilitarian model		Hedonic model		Full model	
	SPC	T-value	SPC	T-value	SPC	T-value
H1:PEOU→PU	0.290	4.045***	0.538	7.183***	0.436	5.418***
H2:PEOU→A	0.164	2.611**	0.220	2.529*	0.171	2.573*
H3:PU→A	0.682	11.353***	0.559	5.646***	0.657	9.175***
H4:A→I	0.650	7.952***	0.590	10.217***	0.627	8.944***
H5:PU→I	0.171	1.854	0.277	4.417***	0.213	2.687***
H6a:PIQ→PU	0.509	7.430***	0.287	3.591***	0.401	5.129***
H6b:PIQ→PEOU	0.395	5.685***	0.332	4.152***	0.374	5.605***
H7a:PSQ→PU	0.091	1.458	0.109	1.774	0.074	1.080
H7b:PSQ→PEOU	0.370	4.917***	0.370	3.999***	0.366	4.550***

Table 2 Models summary

Note: * p<0.05, ** p<0.01, *** p<0.001; SPC is "Standardized Path Coefficient".

5   DISCUSSION AND CONCLUSION

The purpose of our study was to extend the TAM model by including the perceived web quality component and examine the moderating impact of user motivations on user behavior in the Web 2.0 application. We demonstrated that perceived web quality (i.e., information quality and system quality) affected the perceived belief (i.e., PEOU and PU) of users, with the exception that perceived system quality did not have significant impact on perceived usefulness, which meant that users care about information quality more than system quality. It provides a practical implication for service providers. When designing applications, service providers should think about how to well organize, store, and share user provided information to strengthen attraction to their provided services.

The results showed that utilitarian and hedonic motivations had a moderating impact on the relationship between perceived belief and user attitude as well as on the relationship between perceived information quality and perceived belief in the Web 2.0 application. An interesting finding was that the relationship between perceived usefulness and user attitude was stronger in the utilitarian user motivation. On the contrary, the relationships between perceived ease of use and user attitude and behavioural intention were stronger when the user had hedonic motivation. From the practical perspective, the developers and designers of Web 2.0 application should clearly define what type of values they want to provide to their users. For example, if service providers want to attract more utilitarian-oriented users or provide their users with more utilitarian-oriented values, they should devote greater efforts to determining which design of their services can strengthen the users' perception of the usefulness of those services. Furthermore, the user motivation only affected the relationship between perceived information quality and perceived usefulness, which was stronger in utilitarian user motivation. Therefore, the service providers should endeavor to ensure the information quality of their services, especially when they aim to provide utilitarian value to their users.

TAM related hypotheses were all supported, with the exception of the H5, which meant that perceived usefulness did not have a direct relationship with user intention in utilitarian motivation. The result showed that the path coefficient between user attitude and user intention was greater in utilitarian motivation (.650 versus .590). It might imply that the relationship between perceived usefulness and user intention in utilitarian motivation is indirect and also mediated by user attitude. This phenomenon still needs further exploration in future research.

This study has some limitations that provide some opportunities for future research. First, Web 2.0 applications are not limited to these two types we chose for conducting experiment. Further research needs to include more kinds of Web 2.0 applications to reach a more general research conclusion. Second, though most participants had weekday jobs, still 28.4% of the sample was full-time university students. The data collection in future research has to recruit participants from various backgrounds to avoid sampling bias.

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