

Cyber Mall and e-Trading, What will Determine the Website Acceptance? :

An Extension of TAM

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Abstract

With the e-business paradigm emerging, the website became a critical resource for most corporations. However, the amount of value creation through internet is still in question. This paper shows the result of an exploratory study on website assessment, following the tradition of Technology Acceptance Model (TAM). We viewed the intended usage as the value of the website and added such factors as playfulness, compatibility, system quality, and information security as external variables of the model.

The website value could differ depending on website types, purposes of the use and system quality. In the case of internet shopping malls, playfulness, compatibility, website quality were identified as key influencers, while for stock trading users, however, compatibility and security factors are more important. In terms of user purposes, information search requires both the compatibility and the website quality. For each variable considered, empirical results are discussed and practical implications are provided.

1. Introduction

Increasingly, much more corporations have intended to create added values through the internet as e-business paradigm has changed the management environment dramatically. And, a website is considered as one of the critical resources of corporations. In terms of e-business, a website can be defined as a space in which individuals or corporations can achieve their own aims much more effectively by using web and some measures which bust the web, that is IT(Information Technology)[16].

With this arose attention to the websites founded and operated by corporations, some part of the industry has accepted an evaluating method which counts the points such as importance in a category, for instance, "The Best Web Awards" and degree of perception, weighting value and measures the ranks among websites on a basis of the counted points. However, there could be lots of methodological limits in these kinds of evaluation models.

Firstly, credibility and validity of the evaluated category need to be made sure of. Because, one website could have various evaluations depend on the evaluation models and evaluated groups.

Secondly, there have been any attempts to classify evaluation category considering the type of a website. Because, present evaluation models contain evaluation category for websites in some particular fields and are concerned about the evaluation of only system and contents.

Thirdly, there are no post-analysis on how the result of the evaluation has contribute on creating value for the website and why they find some difference of the influences between the factors.

Thus, the results based on these kinds of evaluation models are not able to represent the value of a website objectively. And, in effect, there has not been conducted any research on the influences on the achievement of corporations such as sales amount and market share even though these commercial evaluation results could be taken advantage of as a criterion for a advertisement or a public relations[17].

In the academic world, the two schools of management information and marketing have lively conducted researches related to websites in recent 2-3 years. They contain the research on founding and comparing evaluation models for measuring the effectiveness of the websites[7,12,22,24,26,27] and on some factors which influence the satisfaction and willingness to re-visit of the website [4,13,18,19,21,25,26], which are focused on the point of view of the users. But, theological system on website evaluation model has not been well-organized, so it cannot explain why certain site is easily accepted and continuously used by users in effect. Also, it cannot evaluate the real value of a website.

The school of management information has actively studied the convenience and usefulness recognized by users as the most critical factor which influences on the acceptance and application. Many researchers have conducted researches related to technological acceptance such as TAM(Technology Acceptance Model) which is the most well-known theory, and the researchers agree that this convenience and usefulness recognized by users is very useful to predict the use of information system [1,2,3,5,8,9,19]. But, in effect, existing studies based on the two factors above have been applied to only some software programs for the office work.

Of course, it seems to be limited to explain technology acceptance of individuals with existing TAM factors as regards newly emerged internet technology such as website since mid 1990s. Because the individual use of website differs depending on the characteristics of the websites, purposes of the use and motivational factors such as making leisure, playfulness and information security.

Thus, this study has started with questions below.

Question 1: Is it possible to explain the user's acceptance of website with the existing TAM?

Question 2: What are the persuasive factors that make it possible to extend the existing TAM on the web?

Question 3: Is there any differences between the variables that influence website use depending on website types ?

We have tried to extend the TAM through accepting more concepts under the circumstance of websites. With doing so, we have made clear what is the main factor which influences the user's acceptance of websites and how it is influenced by on website types.

Also, by measuring the TAM's dependent variable, that is, usage with continued intention of use, we have intended evaluate the value of website. And we sorted websites based on website types and analyzed the differences among the influencing variables of each sort.

2. Literature Research

2.1 Technology Acceptance Model

The Technology Acceptance Model (TAM) is a theory which was suggested for the purpose of explaining the user's technology acceptance on the basis of the theory of the rational act [12]. According to this theory, technology acceptance influences real act through some acting intentions from perceived ease of use and perceived usefulness.

Perceived ease of use means the extent to which an individual believes to need less physical and mental effort by using particular system. And perceived usefulness means the extent to which an individual believes to improve one's achievement by using particular system. Also, in terms of the innovation theory, relative advantage, appropriateness, complexity, chances to test and visibility are mentioned as important traits for acceptance.

In the 1990s, based on the Technology Acceptance Model (TAM), many have been conducting their research designing generalization of the model such as extension of variables and applications of new technology.

For instance, Igbaria et al. conducted a research [11] with PCs as object of the study and showed a complex motivation model consisting of external variables such as technology, support from organization, and level of use in organization and intervention variables such as complexity, usefulness, playfulness and social pressure. This study pinpointed that these variables above have an influence on the level of PC using directly.

Karahanna, Straub & Chervany [14] conducted a vertical study with object of Window OS, by comparing potential accepters and continuous users, they suggested that acceptance and continuous use are influenced by different factors. In other words, acceptance is more influenced by normative factors while continuous use is likely to increase when user is forced to use continuously or, has more affirmative attitude to use.

Adams et al. [1] verified the TAM model and mentioned some factors such as user's experience of use, user's characteristic, professionalism on using the system and characteristics at work.

Ji-won, Moon and Young-gul, Kim [18] shows that with adding one variable – playfulness under the circumstance of world wide web, ease of use is more influential on playfulness especially playfulness has more influence on user's attitude than ease of use does.

2.2 Website evaluation model

Website evaluation model is classified into two points of view in terms of the way of evaluation. First one is measuring how one website is convenient and useful in user's position, and it is directly related to marketing strategy of corporations. Second one is evaluating websites by measuring how it contributes to the corporation's overall strategy such as organized activities and managements in corporation's position.

Selz & Schbert [7] pointed out a problem in their study, which means there is no increase in users who visit and utilize websites regularly, even though tons of websites with gorgeous designs and graphic are being founded. Also, in the case of internet shopping mall, they've found some myths not to be true. For example, those who enter the field earlier will be successful or extravagant investment on websites and technological development is not always be successful. And, they developed transaction theory containing 3 stages in e-commerce (searching information, negotiation, confirmation) and disclosed factors that make websites successful, by importing the stage of communications.

In the stage of searching information, customers collect information on goods or services. In the stage of negotiation, the relationship between customers and suppliers gets close and some details such as detailed information on goods, payment, delivery service are controlled. In the stage of confirmation, finally customers decide to purchase goods and then payment and delivery physically or virtually. The main concept in the stage of communication is community, which is marked with intimacy between customer and customer, customer and corporation. They can be controlled and applied depending on website types of business types and also applied extensively to B2C and B2B as well, depending on whether effective data can be collected or not.

Keevil [15] offered the questions and answers check list to measure the level of the usefulness of website and evaluated some real websites with the method. 5 factors contained in the check list were the degree of possibility to search information needed, the degree of understanding information, the degree of supporting customer activities, the accuracy of technological information and quality of information.

Evaluating websites in the position of corporation means evaluating corporation's organization and management rather than marketing and there have been lots of studies concerning controversy over e-business in the near future.

Massoto [17] began to study the formation and evaluation of websites for e-commerce in the position of corporation and provided with a framework evaluating e-commerce in the corporation's marketing strategic point of view and have influenced on the study of website evaluation from the corporation's position. Also, Massoto raised a question on how corporation is benefited from website and predicted the benefits and values caused by effective utilizing of websites and explained some chances that corporation can take through website. He evaluated specific chance factors such as marketing and sales, supporting customer, public relationship, purchasing, internal communication and explained quantitative and qualitative benefits to measure the chance factors.

Ho [10] has studied on what value is created through information system, especially information system on the web. He sorted websites into 3 categories (promotion of goods and services, providing with data and information, processing on transaction) and pointed out evaluation factors such as suitability, customer-oriented, goods in stock and character of direction.

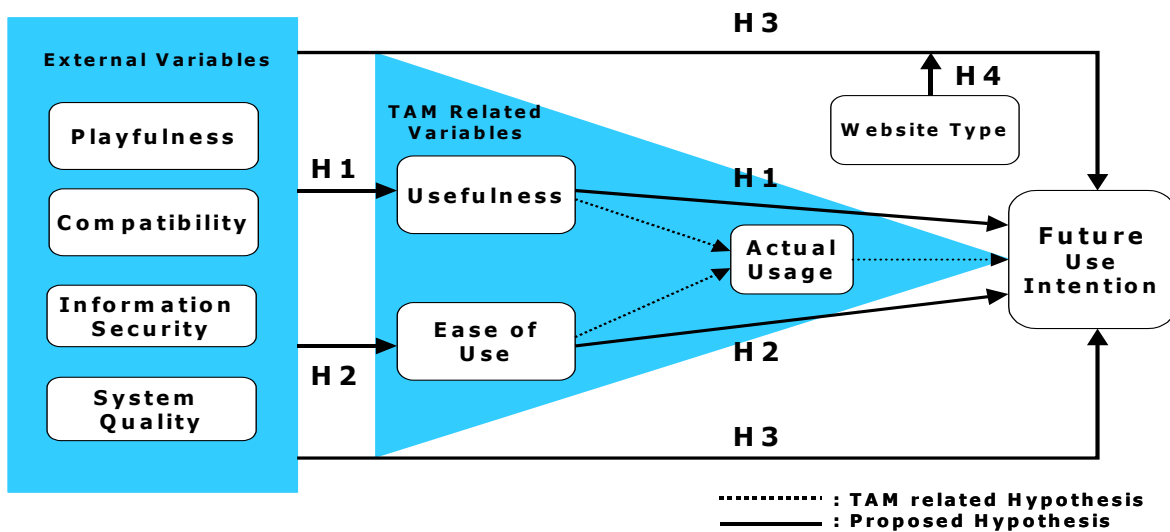
3. Research Model and Hypotheses

3.1 The Model and Hypotheses

In the present study, the widely known Technology Acceptance Model(TAM) was extended and adjusted to the website environment. The study tries to find the factors influencing the accepting behaviors of the website users and to understand the applicability of the existing TAM to the website environment with the previously verified ease of use and usefulness as two intermediary variables.

The usage, the dependent variable of TAM, was interpreted as related to the persistent intention of the use and as ultimately identified as the value of a website; also analyzed was the difference among such influencing variables as the website types.

Fig. 1 Research Model



In other words, such variables as playfulness, compatibility, information security, and website system quality were added to the existing TAM; it was examined to what extent the above variables influenced the easiness in the use, the usefulness, and the persistent intention of the use all of which were newly recognized variables under the website environment; and finally, it was also analyzed whether the found relationships varied according to the website types.

The hypotheses resulting from the research model are as follows:

- Hypothesis 1 : The external variables(playfulness, compatibility, Information security, and system quality) would influence positively the recognized usefulness, and would thereby influence indirectly the persistent use of a website.
- Hypothesis 2 : The external variables would influence positively the recognized ease of use and would thereby influence indirectly the persistent use of a website.
- Hypothesis 3 : The external variables would influence positively and directly the persistent use of a website.
- Hypothesis 4 : The extent of influence of the external variables on the persistent use of a website would vary according to the website types.

3.2 Operational Definition of the Variables

The operational definition of the variables used in the present study is as in <Table 1>.

Table 1 Operational definition of the variables

	Name of Variable	Definition	Variable in detail
Independent	Playfulness	Belief of satisfaction of fundamental motives through the interaction with a website	2 items on concentration inducement, 2 items on pleasures, 2 items on fun, and 1 item on interest inducement; total 7 items
	Compatibility	Contents, design, images, and functions appropriate to a particular website	5 items about proper contents, screen, functions, menu, and images
	Information security	Degree of trust in the protection of user information and payment procedures	4 items about user information, payment information, information opening, and reliability
	Website quality	Quality of operating system of a website	6 items about access rates, speed of accessing and downloading, moving rate, accuracy, and loading rate
Intermediary	Usefulness	Degree of belief of accomplishment of user purposes by visiting a website	2 items on accuracy, 1 item on quality improvement, 2 items on productivity improvement, and 1 item on reduction of user time and user cost, respectively; total 7 items
	Convenience	Degree of belief of reduction in physical and psychological efforts related to the use of a website	No need of experts, easiness in the use, reduction in learning time, and small efforts; total 4 items
Moderate	Website types	Types of profit model in on-line business.	cyber mall/e-trading
Dependent	Persistent intention of the use	Persistent intention of the users, not switching to another site	3 items about regular visiting, user intention, and active recommendation

4. Analysis of the Data

4.1 Objects and Methods of the Research

Four hundred adults who had an experience of visiting Cyber mall or e-trading sites were surveyed in order to testify the research model. The questionnaire was conducted with target of about 310 general users, total 310 copies of questionnaire being distributed and 300 copies collected. A direct visit method after explaining the purpose and motive to each respondent was selected as a survey method. 180 fell into Cyber mall, 120 into e-trading; the types above were classified according to the website types.

4.2 Test of Reliability and Validity

Exploratory factor analysis was adopted as the testing measure of reliability. The measured items whose cumulative value of factors was below 0.6 were eliminated, and the test of reliability was applied to each factor. Cronbach's Alpha coefficients corresponding to each factor were above 0.6, which verified the high reliability of the measured variables. <Table 2> Reliability Test of the Research Variables

Table 2 Reliability Test of the Research Variables

Variable	Research variable		First items used in exploratory factor analysis	Items excluded from exploratory factor analysis	Cronbach's Alpha
Independent variable	Playfulness	Playfulness	7	1	.8689
		Absorbability			.8115
	Compatibility		5	-	.8251
	Information security		4	1	.7481
	Website quality		6	-	.7763
Intermediary /Dependent variable	Usefulness		7	2	.7843
	Ease of Use		4	-	.7589
Dependent variable	Persistent intention of the use		3	-	.7013

The result of Varimax-type factor rotation, as shown in <Table 3>, showed the grouping of 9 factors; and the cumulative values of factors above 0.6 indicated high concentrating validity.

4.3 Hypothesis Testing

4.3.1 Test of the influence of the external factors on the on the persistent intention of the use, with the usefulness as an intermediary variable

The regression analysis was applied in three stages in order to test hypothesis 1. The influence of the 5 independent variables on the intermediary variable(usefulness) were tested in the first stage; the influence of the independent variables on the dependent variable(persistent intention of the use) were tested in the second stage; and the regression analysis was applied simultaneously to the 5 independent variables and the intermediary variable in the final stage.

Playfulness, compatibility, and website system quality were shown to influence significantly the usefulness; and absorbability, compatibility, website system quality, and information security were shown to influence directly the persistent intention of the use. However, only two factors, compatibility and website system quality, were shown to influence the persistent intention of the use, partially mediated by the usefulness.

Table 3 Results of factor analysis

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Quality 3	.808							
Quality 1	.780							
Quality 2	.752							
Quality 4	.746							
Quality 6	.688							
Quality 5	.614							
Compatibility 3		.810						
Compatibility 2		.781						
Compatibility 4		.761						
Compatibility 5		.705						
Compatibility 1		.668						
Usefulness 2			.836					
Usefulness 3			.776					
Usefulness 1			.700					
Usefulness 4			.688					
Usefulness 5			.638					
Easeofuse1				.808				
Easeofuse4				.793				
Easeofuse2				.790				
easeofuse3				.758				
Playfulness5					.894			
Playfulness6					.841			
Playfulness4					.644			
use2						.861		
Use1						.717		
Use3						.706		
Playfulness2							.823	
Playfulness1							.765	
Playfulness3							.713	
Security1								.833
Security3								.797
Security2								.634
Characteristic value	8.869	3.247	2.817	2.213	1.829	1.604	1.327	1.284
Explained variance	24.637	9.018	7.825	6.148	5.080	4.454	3.686	3.567
Cumulative variance(%)	24.637	33.656	41.481	54.544	59.624	64.078	67.764	74.237
Factor	Web quality	Compati-bility	Usefulness	Ease of use	Absorba-bility	Persistency	Playfulness	Security

Table 4 Regression results on hypothesis 1

Dependent Var.	Independent Var.	Unstandardized Coef.		Standardized Coef.	t	Sig.
		B	S.E.	Beta		
Usefulness	Playfulness	.121	.072	.136	1.672	.097
	Absorbability	6.864E-02	.062	.092	1.110	.269
	Compatibility	.432	.084	.42	5.126	.000
	Web quality	.276	.091	.247	3.032	.003
	Information security	-6.9E-02	.066	-.076	-1.034	.303
Persistent intention of the use	Playfulness	1.642E-02	.099	.015	.166	.868
	Absorbability	.169	.084	.182	2.001	.048
	Compatibility	.345	.115	.258	3.005	.003
	Web quality	.308	.124	.222	2.476	.015
	Information security	-.190	.091	-.170	-2.093	.039
Persistent intention of the use	Playfulness	-9.9E-03	.099	-.009	-.100	.920
	Absorbability	.154	.084	.166	1.830	.070
	Compatibility	.251	.126	.188	1.992	.049
	Web quality	.247	.128	.178	1.934	.056
	Information security	-.175	.090	-.156	-1.935	.055
	Usefulness	.218	.125	.175	1.734	.086

4.3.2 Test of the influence of the external factors on the persistent intention of the use, with the ease of use as an intermediary variable

The regression analysis was again applied in three stages to test hypothesis 2 in this time with the ease of use as an intermediary variable. Only compatibility was shown to influence the convenience, and absorbability, compatibility, website system quality, and information security were shown to influence directly the persistent intention of the use. However, only compatibility was shown to influence the persistent intention of the use, partially mediated by the ease of use.

Hypothesis 3 can also be tested through <Table 4> and <Table 5>. The external variables such as absorbability, compatibility, website system quality, and information security were shown to influence significantly the persistent intention of the use; only playfulness was excluded from the variables having significant influence.

Table 5 Regression results on hypothesis 2

Dependent Var.	Independent Var.	Unstandardized Coef.		Standardized Coef.	t	Sig.
		B	S.E.	Beta		
Ease of use	Playfulness	9.850E-02	.087	.111	1.127	.262
	Absorbability	-3.4E-02	.075	-.046	-.461	.646
	Compatibility	.271	.102	.253	2.662	.009
	Web quality	.170	.110	.153	1.546	.125
	Information security	4.991E-02	.080	.056	.622	.535
Persistent intention of the use	Playfulness	1.642E-02	.099	.015	.166	.868
	Absorbability	.169	.084	.182	2.001	.048
	Compatibility	.345	.115	.258	3.005	.003
	Web quality	.308	.124	.222	2.476	.015
	Information Security	-.190	.091	-.170	-2.093	.039
	Playfulness	9.109E-03	.099	.008	.092	.927

intention of the use	Absorbability	.171	.085	.185	2.025	.045
	Compatibility	.325	.118	.243	2.742	.007
	Web quality	.295	.126	.213	2.345	.021
	Information security	-.193	.091	-.173	-2.125	.036
	Ease of use	7.421E-02	.105	.060	.706	.481

4.3.3 Test of the extent of the influence varying according to the website types

The regression results between the independent and dependent variables were as <Table 6> which provided a test of hypothesis 4.

Table 6 Regression results on hypothesis 4

Adjusting Var.		Significant Independent Var.	Unstandardized Coef.		Standardized Coef. Beta	t	Sig.
			B	S.E.			
Website types	Cyber mall	Playfulness	.289	.106	.281	2.717	.008
		Compatibility	.349	.171	.224	2.037	.046
		Web quality	.488	.169	.315	2.896	.005
	E-trading	Absorbability	.247	.144	.303	1.720	.092
		Compatibility	.363	.127	.387	2.856	.006
		Information security	-.257	.133	-.249	-1.941	.059

As a result, the cyber mall-type sites were shown to be influenced by such factors as playfulness inducing fun and interests, website structure fitted to the purposes of the use, website quality including transmit speed and visiting rates; on the other hand, the e-trading sites were influenced significantly by absorbability required from the necessity of concentration and information security such as user information or payment information.

5. Conclusions

The present study analyzed the accepting behaviors of the users with the aid of TAM, and also analyzed the related variables affecting those behaviors, thus providing a test on the TAM extended to the website environment.

The results of the study can be summarized as below;

First, the existing Technology Acceptance Model(TAM) was tested in the context of the newly emerging website environment; and as a result, playfulness, absorbability, website quality, and information security all of which were new variables specific to web environment were exploratory studied. These variables were not given attention in the previous studies as they belonged to new type of variables in the web environment, which in turn would contribute to the extension and elaboration of the existing model.

Second, the dependent variable was defined not as actual using rates but as the persistent intention of the use in order to grasp the relationship with the independent variables and to draw such factors as absorbability, compatibility, website quality, and information security. The actual using rates, when measured as the degree of recognition by an individual, could be distanced from actual using behaviors according to scholarly criticism; so they should be reinterpreted in terms of the value of a website. In other words, the actual using rates should be extended in its definition to becoming such variable including persistent visiting(page view, traffic indicator, or visitor numbers) and website loyalty. The present study thus suggested several of major factors which should be considered when it came to the new construction or remodeling of a website.

Third, the varying extent of influence was analyzed according to the website; cyber mall sites were shown to have to concentrate on playfulness, compatibility, and website quality while e-trading sites should emphasize absorbability and information security.

The shortcoming of the present study was the lack of sample size corresponding to each type, thus prohibiting deeper analysis of the data. Path analysis should be used in the analysis of the relationship between the independent and dependent variable mediated by the usefulness and convenience. Additional analyses are needed using LISREL. Finally, the value of a website would be extended beyond the persistent intention of the use into an asset of the corporate management, which requires further study.

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