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EXPLORING DIFFERENT ROLES BETWEEN SERVICE EXPECTATION AND TECHNOLOGY EXPECTATION IN CITIZEN'S E-GOVERNMENT CONTINUANCE ADOPTION: AN EXTENDED EXPECTATION-CONFIRMATION MODEL

Research-in-Progress

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Abstract

Although Chinese government has got remarkable achievement in e-Government development, the difficult issue that citizen use behaviour cannot last toward many e-Government services has long been troubling to government in different levels. Based on expectation-confirmation theory (ECT), this paper proposed an extended model by divide the expectation and perceived performance into two categories, service perspective and technology perspective, for understanding the different roles of those factors in the process of e-Government continuance adoption. The research plan of an empirical experiment toward the e-Government portal of Beijing, the capital of China for utilizing this extended model was also discussed briefly in the paper.

Keyword: Expectation-confirmation theory (ECT), e-Government, Continuance use behaviour, Service expectation, Technology expectation

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1 INTRODUCTION

Information communication technology (ICT) has been demonstrated to be one of the key driving factors of organizational performance promotion in last two decades (Devaraj & Kohli 2003). Since seeing e-Government as an effective approach for supporting the transition from bureaucrat-centered towards citizen-centered government, Chinese governmental agencies on various levels has all been strongly promoting e-Government service in most of departments. After the implementation of a series of “Golden Projects” (Tang 1998), as well as continuous efforts in extensively building governmental websites (Ma et al. 2005), according to reports released by United Nations, the ranking of China in the chart of e-Government application maturity (or readiness) has been rising as well (UN 2010). It is reasonable to predict that the e-Government development in China will keep its fast pace and enjoy a broad stage.

However, any system couldn't fulfil their value when they have not been adopted by users. Unfortunately, the adoption, especially post-adoption of e-government systems in China is not satisfied. In many cases, the use behaviour cannot last. The user acceptance of a new system starts satisfactorily well, but declines sharply after the initial stage is over (Zhang et al. 2010). Therefore, the continuance use intention and behaviour is an important issue worth exploring for e-Government in China.

Expectation-confirmation theory (ECT), proposed by Oliver (1980), presented in many influential IS literatures (Bhattacharjee 2001; Bhattacharjee & Premkumar 2004; Limayem et al. 2007; Susarla et al. 2003; Venkatesh & Goyal 2010), has been validated that have good capacity for explaining ICT post-adoption or continuance use behaviour. In e-Government context, many services changed from face-to-face pattern to online pattern. Sometimes the transition is mandatory by government (Chan et al. 2010). In the case, the citizens' perceptions on service pattern and service content have different to each other, and maybe play different roles in continuance adoption. Especially for e-government websites, most online services are seen as a set of pure IT functions, but rather an update of traditional government services in information age. At ten years after IT booming on the Millennium, it is no doubt that people focus on more some other determinants rather than technological factors for their IT/IS continuance adoption.

Therefore, we extend the ECT model for distinguishing service perceptions and technology perceptions and analyzing the determinants to e-government continuance use intentions of citizen in the paper. The method and schedule of the empirical validation point to e-Government portal of Beijing (www.beijing.gov.cn), the capital of China, and expected results and contributions also discussed.

2 THEORETICAL FRAMEWORK

2.1 Expectation-Confirmation Theory (ECT)

Although most prior IT usage research has focused on initial IT usage or acceptance and provide a series important such as technology acceptance model (TAM) and unified technology adoption and use theory (UTAUT) (Davis et al. 1989; Venkatesh et al. 2003), IT continuance or participation has also gained increased more attention among researchers (Bhattacharjee 2001; Bhattacharjee & Premkumar 2004; Limayem et al. 2007; Susarla et al. 2003; Venkatesh & Goyal 2010), and has been influenced primarily by expectation-confirmation theory (ECT) (Oliver 1980).

On the evolution of the model ,early scholars suggest that performance specific expectation and expectancy disconfirmation, play a major role in satisfaction decisions (Oliver 1977), and Oliver (1980) proposed a cognitive model of the antecedents and consequence of satisfaction decisions,

certificating that expectation and expectancy disconfirmation satisfaction could influence attitude change and purchase intention. After that, Bearden and Teel (1983) used a two-period longitudinal study to validate Oliver's (1980) two-stage EDT model in the marketing literature, and Boulding et al. (1993) and Olson and Dover (1979) used three-period studies to validate Oliver's model. Most empirical EDT research directly linked disconfirmation or satisfaction to users' later intention (Bhattacharjee 2001; Patterson 1997; Spreng et al. 1996). Bhattacharjee (2001) provided a model integrated confirmation and user satisfaction constructs (See Fig. 1), offered an initial explanation for the IS acceptance discontinuance, based on earliest theoretical models of IS continuance.

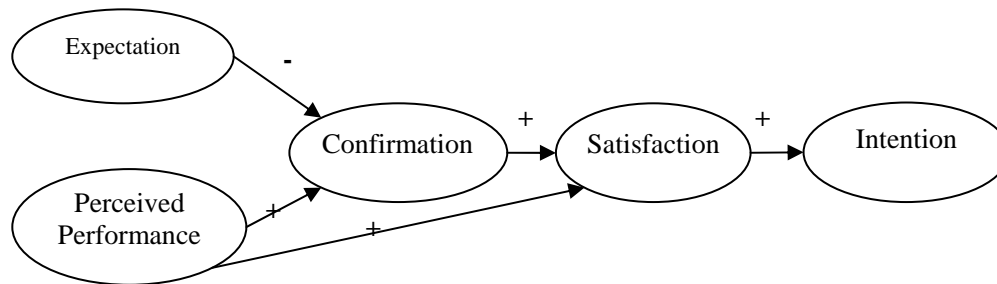


Figure 1. The Expectation-Confirmation Model (Bahattacherjee 2001)

In recent years, some scholars proposed integrated models which combining with TAM (Bhattacharjee & Premkumar 2004; Premkumar & Bahattacherjee 2008; Roca et al. 2006), theory of planned behaviour (TPB) (Hsu et al. 2006), and self-determination theory (Lin et al. 2009). More research was focused on the specific event analysis (Hu & Kettinger 2008; Susarla et al. 2003; Thong et al. 2006; Vreede et al. 2008). Venkatesh and Goyal (2010) also present polynomial modelling and response surface methodology as a solution for ECT's logical and analytical limitation.

2.2 Service Perspective and Technology Perspective of ECT

Many scholars have conducted on the relationship researches among service, technology and user satisfaction. Such research has the potential to be very influential because it will influence the way in which people understand the relationship between new technology and service, in particular, it probably would involve building better user relationships and restructuring the service function would be on using technology to serve for users better (Rust et al. 1999). In e-government context, "providing more services and more convenience to citizens," is generally considered as the essential target for e-Government applications (Holliday and Yep 2005). When constructed the model of e-Government user satisfaction, Scott et al. (2007) divided quality evaluation into system quality and service quality, for describing the difference between technology and service.

E-government system not only can be seen as a kind of information technology to improve government management performance, but can be considered a service function to enhance capacity of government's public service. Concerned about service function while abandoned information technology, or concerned about information technology while abandoned service function, both are biased. Some IS literatures focus on user adoption of e-government services (Carter & Belanger 2005; Chan et al. 2010; Olphert & Damodaran 2007). E-government needs take information technology as hardware, and also take service as software. Previous studies of IS acceptance model focused on the technical level. Thus, in the study of information systems on users' continuance adoption, integrating service function and information technology to measure their relationship with user satisfaction is critical, but it is precisely lacking in the past.

Wixom and Todd (2005) discussed user satisfaction instruments from three categories: information quality, system quality and service quality. Since the paper focused on the broader target of the IS function rather than on the individual application, however, the service quality has not been included

in their validating model. Unlike this work, in order to evaluate continuance adoption with overall e-Government services, we paid more attention on service perspective of users' perceptions.

In previous ECT related research, most literature focus on general perspective of expectation and performance. For meeting needs of empirical situation, some studies examined service acceptance or technology use, but not conscious to discuss the difference between those two categories of perceptions (See Table 1). In Susarla et al. (2003) conceptual model of satisfaction with application service provision, they tried to divide expectation concept into functional capability and technical performance guarantees. However, those two sub-factors are more specific for the situation and could not describe the difference of expectation in general.

Focus	General Perspective	Service Perspective	Technology Perspective
Literature	Bhattacharjee 2001; Cheung et al. 2006; Roca et al. 2006; Premkumar & Bhattacharjee 2008 Vreede et al. 2008; Lin et al. 2008; Venkatesh & Goyal 2010;	Khalifa & Liu 2003; Susarla et al. 2003; Hsu et al. 2005; Hu et al. 2008	Bhattacharjee & Premkumar 2004; Lin et al. 2005; Thong et al. 2006; Limayem et al. 2007;

Table 1. Research perspectives of previous ECT literature in IS disciplines

In this study, the conceptual model of e-government system acceptance and satisfaction divides the users' expectations and perceived performance into two categories of service and technology, and designs service perceptions and technology perceptions as two parallel measure variables. Then, this study will initiate to confirm that users' different expectations and perceived performances for IS in information technology and services function will affect the final users' satisfaction and intention.

2.3 Hypotheses of Influence Paths

Based on previous studies mentioned above, we have provided an extended ECT model for e-Government continuance adoption. According to traditional expectation-confirmation model which is shown as Fig.1 (Bhattacharjee 2001), we believe that the explicit effects of technology for users' satisfaction, while expecting good service and perceiving wonderful service performance which IS can offered have both direct and moderating effects on users' satisfaction. Therefore, we inherited most on hypotheses in traditional ECT model.

For distinguishing the different roles between service perceptions and technology perceptions, we divided "expectation" and "perceived performance" into distinct levels of technology and services in the proposed model. User's perceived confirmation is influenced by expectation (service expectation and technology expectation) and perceived performance (perceived service performance and perceived technology performance), while users' satisfaction is influenced by confirmation and perceived performance (perceived service performance and perceived technology performance). Since the path from expectation to satisfaction is not validated in most of previous studies (Bhattacharjee 2001, Bhattacharjee & Premkumar 2004; Premkumar & Bhattacharjee 2008), we omitted those hypotheses in our model.

In addition, user beliefs and attitudes do change over time (Bhattacharjee & Premkumar 2004; Venkatesh & Morris 2000, Zhang et al, 2010), so users' initial intention and continuance intention will be different. Whether there is correlation or influence between the two intentions, and what kind of relationship exists between different intentions with final user's satisfaction, are considered in our model.

Therefore, we have the following hypotheses:

H1a: User's service expectation has positively significant influence on his (or her) initial adoptive intention.

H1b: User's technology expectation has positively significant influence on his (or her) initial adoptive intention.

H2a: User's service expectation has negatively significant influence on his (or her) perceived confirmation.

H2b: User's technology expectation has negatively significant influence on his (or her) perceived confirmation.

H2c: User's perceived service performance has positively significant influence on his (or her) perceived confirmation.

H2d: User's perceived technology performance has positively significant influence on his (or her) perceived confirmation.

H3a: User's perceived service performance has positively significant influence on his (or her) satisfaction.

H3b: User's perceived technology performance has positively significant influence on his (or her) satisfaction.

H4: Users' perceived confirmation has positively significant influence on his (or her) satisfaction.

H5a: Users' satisfaction has positively significant influence on his (or her) continuance adoptive intention.

H5b: Users' initial adoptive intention has positively significant influence on his (or her) continuance adoptive intention.

The extended ECT model with basic hypotheses is shown as Fig. 2.

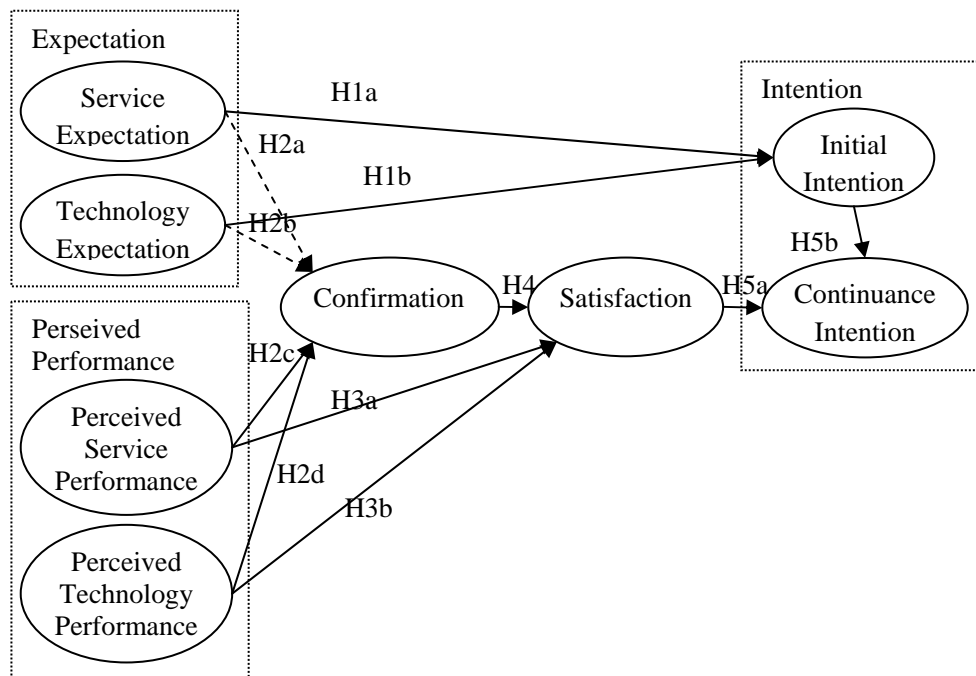


Figure 2. The extended ECT model with basic hypotheses

3 RESEARCH DESIGN

3.1 Target System

In order to validate the extended ECT model for E-government system proposed in this paper, we will conduct an experiment among college students and investigate their perceptions, user behaviour and continuance intentions to a local e-Government service portal, the web government portal of Beijing (www.beijing.gov.cn).

The target e-government service portal was open on July 1, 1998, for the unifying and standardizing the image promotion of the capital, implementing the government information open, strengthening of administrative supervision, constructing networking complaint mechanism, providing more convenient public service to the citizen in Beijing, the capital of China. In the past decade, the website sincerely effort on providing more information services to the people, and made a positive contribution on capital's economic development and cultural exchanges.

3.2 Data Samples and Experiment Schedule

As mentioned, we will conduct an experiment including two around survey and three trial task toward college students from several universities in Beijing. Expected sample size is around 200. When the experiment begin, participants will be asked to fill the first questionnaire, which includes questions on basic information, prior experiences, expectation and initial adoptive intention; Subsequently, participants will be asked to complete three tasks, including information searching, online transaction conducting and online responding to government officials; Finally, participants need to fill the second questionnaire, which regarding on task completed situation, confirmation, perceived performance, satisfaction and continuance adoptive intention. All process need 60 to 90 minutes in total.

3.3 Items Development and Measure

Items that will be used in the experiment are listed in Table 2.

Construct	Items	Survey Time	Origins or References
Service Expectation	I expected the service quality of **IS to be good	First Round	Fornell et al. 1996; Susarla et al. 2003; Lin et al. 2009
	I expected that the service of **IS to be effective		
	Expectation regarding usage, service provided by **IS fits the users' personal requirements.		
Technology Expectation	Expectation regarding reliability, **IS wouldn't go wrong.	First Round	Fornell et al. 1996; Susarla et al. 2003;
	Expectation regarding usage, IT provided by **IS fits the users' personal requirements.		
Confirmation	My experience with using **IS was better than what I expected.	Second Round	Bhattacharjee 2001; Khalifa & Liu 2003; Susarla et al. 2003; Lin et al. 2005; Cheung et al, 2006; Hsu et al. 2006; Roca et al. 2006; Thong et al. 2006; Vreede et al. 2008
	The service level provided by **IS was better than what I		

	expected.		
	Overall, most of my expectations from using **IS were confirmed.		
Satisfaction	Overall satisfaction	Second Round	Fornell et al. 1996; Bhattacharjee 2001; Khalifa & Liu 2003; Susarla et al. 2003; Lin et al. 2005; Cheung et al, 2006; Hsu et al. 2006; Roca et al. 2006; Thong et al. 2006; Vreede et al. 2008
	Performance versus the users' ideal IT usage or service provided in the category		
	Expectancy disconfirmation (performance that fall short of or exceeds expectations)		
Perceived Service Performance	Evaluation of usage experience , service provided by **IS fits the users' personal requirements.	Second Round	Fornell et al. 1996; Bhattacharjee & Premkumar 2004; Roca et al. 2006; Lin et al. 2009
	Using **IS will improve government service performance		
	I think now the service actually provided by **IS is worth using		
Perceived Technology Performance	Evaluation of reliability experience , **IS wouldn't go wrong.	Second Round	Fornell et al. 1996; Bhattacharjee & Premkumar 2004; Roca et al. 2006;
	Evaluation of usage experience , IT provided by **IS fits the users' personal requirements.		
	Using **IS will enhance users' effectiveness.		
Initial Intention	I would like to use **IS.	First Round	Zhang et al. 2010
	I think I will try to use **IS.		
	When necessary , I will use **IS.		
Continuance Intention	I intend to continue using **IS rather than discontinue its use.	Second Round	Bhattacharjee 2001; Bhattacharjee & Premkumar 2004; Lin et al. 2005; Hsu et al. 2006; Roca et al. 2006; Thong et al. 2006; Venkatesh & Goyal 2010
	My intentions are to continue using **IS than use any alternative means		
	I plan to continue using**IS to learn about new technologies or software skills.		

Table 2. Variables and instrument items

All the items were translated into Chinese and adjusted in wording in the light of the characteristics of the technology for better understanding. Most of the items were measured using a five-point Likert-type scale, ranging from “strongly disagree” (1) to “strongly agree” (5).

3.4 Analysis Method

After reliability test and validity test, the research model will be validated using partial least squares (PLS), a structural equation modeling (SEM) technique which is more suitable for highly complex predictive models. All SEM analysis in the research will be done by the PLS-Graph 3.0. In addition,

the interaction analysis (moderator analysis) will be conducted by the same software. All these analysis will follow some classical guidelines in literatures of QPR methodologies (Chin et. al. 2003, Gefen & Straub 2005).

4 EXPECTED CONTRIBUTIONS & FUTURE GOALS

This study is expected to generate valuable implications both theoretically and practically. On the theoretical aspect, if the extended model for e-Government system based on expectation-confirmation theory provides good results in the validation analysis, it would be reasonable to believe that the model has well validity to explain IS continuance use behaviour in governmental context. At the same time, the moderator analysis may also offer some new findings around the difference roles between service perceptions and technology perceptions (including expectation and perceived performance), which provide novel thoughts for understanding and explaining deeply e-Government service decline in post-adoption stage. On the practical aspect, the analysis results and related discussion will support the local government to plan for more feasible strategies in the process of implement and promotion of the e-Government systems.

Based on the results of this study, future research will attempt to conduct one or more cross-groups comparisons for the provided model, so as to further test and develop the research model, as well as to further investigate the human characteristics driving factors of e-Government system usage and management in China and other countries.

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