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THE EFFECTS OF PERSUASIVE MESSAGES ON SYSTEM ACCEPTANCE

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Abstract

Firms have to invest millions of dollars to introduce a new system. If firms cannot persuade employees to accept and implement a system effectively, such investments are wasted. Since a given influence process may lead to differential outcomes, managers need to deliver influencing strategies to motivate employees and shape their behavior intentions related to system acceptance. This study integrates TAM, flow theory, and extends ELM to understand employees' system acceptance. The findings indicate that two persuasive messages result in different influencing routes on employees' emotional, functional, and utilitarian responses. Source credibility of persuasive messages has positive influence on playfulness, while argument quality of persuasive messages has positive influence on perceived ease of use and perceived usefulness. Attitude may play mediating roles in the relationship of playfulness-behavior intention and perceived usefulness-behavior intention.

Keywords: Source credibility, Argument quality, Technology acceptance model, flow theory

1 INTRODUCTION

Firms depend on information technology to execute a variety of operational, tactical, and strategic processes. Advanced technology offers a promising new avenue for employees to update their knowledge and skills (Applegate et al. 2003). However, system adoption not only involves technology or system, but the willingness of employees to accept it (Bhattacherjee & Sanford 2009). Persuasive strategies, an employee's characteristics, and interaction with other members may affect the willingness of employees toward using system. Understanding employees' system acceptance behavior not only helps managers deliver influencing strategies to motivate employees, but also shapes their behavior intentions related to system acceptance.

Several theoretical models have been developed to examine an individual's information or technology system acceptance. The Technology Acceptance Model (TAM) has been regarded as especially promising (Schepers & Wetzels 2007, Lee et al. 2005, Davis et al. 1989). TAM links social cognitive theory with the constructs of perceived usefulness and perceived ease of use to understand behavioral and motivational issues in system acceptance. However, most theoretical models have their limitations and contributions, and TAM is no exception (Davis & Wong 2007).

This study proposes several criticisms of TAM. Perceived usefulness and perceived ease of use in the TAM represent the functional and utilitarian aspects of individual perceptions, neglecting an individual emotional variable, such as playfulness, enjoyment, and fun (Koufaris 2002, Lee et al. 2006, Tzou & Lu 2009). The TAM does not explain why and how the influence of external variables may occur. Several researchers have developed a more complex model to provide better explanations for perceptions and their antecedents. Venkatesh and Davis (2000) extended the original TAM model to TAM2 by incorporating external variables, such as subjective norm, job relevance, and demonstrable results. Although prior studies have acknowledged the important roles of external variables in shaping an individual's perceptions, they do not explain how the processes or paths of external variables affect an individual's system acceptance. For example, what kind of message or information is more effective in influencing individuals' emotions and perceptions? Thus, the influencing routes of external variables on an individual's acceptance deserve further validations.

Current studies are limited in unravelling the complexities of a dynamic external influence process (persuasive messages) on an individual's cognitive response (perceived usefulness and perceived ease of use) and emotional response (playfulness). This study addresses the above gaps by integrating TAM, flow theory, and extending Elaboration Likelihood Model (ELM) to present a simple, yet useful theoretical model. This study investigates the influence of persuasive messages, including source credibility and argument quality, on an individual's playfulness, perceived ease of use, and perceived usefulness. This research also explores the interrelationship among playfulness, perceived ease of use, perceived usefulness, attitude certainty, and behavior intention. The ELM is chosen to represent a firm's dual persuasive process, since it relates directly to the influencing processes of employee perceptions and explains why a given influence process may lead to differential outcomes (Bhattacherjee and Sanford 2006). The results provide valuable information for both academicians and practitioners to understand employees' system acceptance behavior. Figure 1 depicts the research framework of this study.

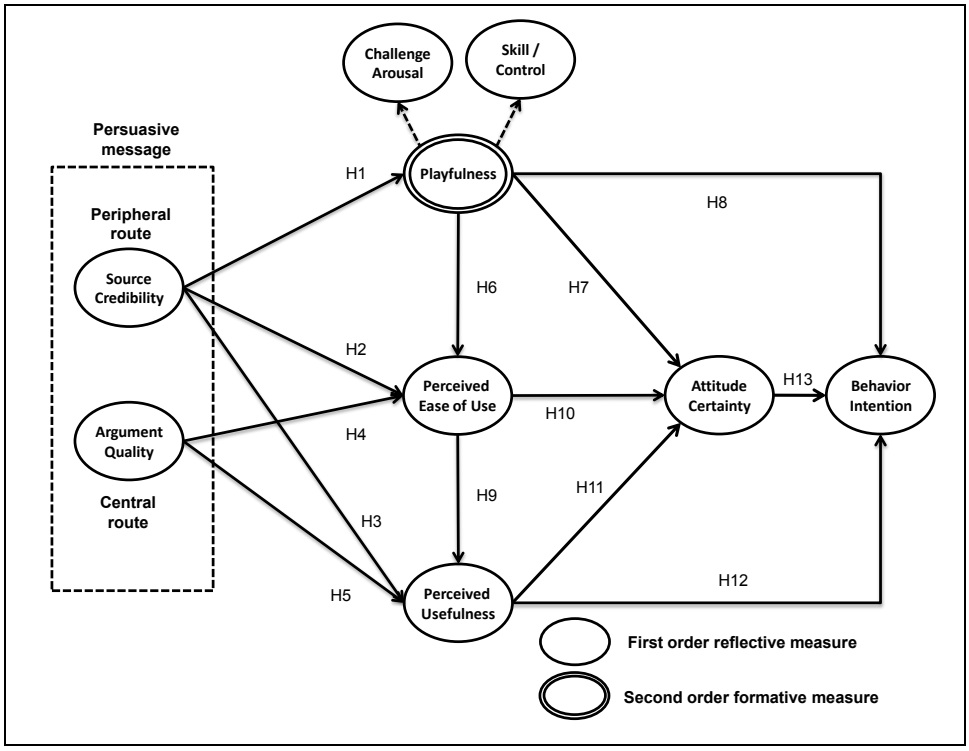


Figure 1. The Research Framework of this Study

2 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

○ The impact of source credibility and argument quality of persuasive message on playfulness, perceived ease of use, and perceived usefulness

ELM has been applied to understand individual information processing and evaluation (Martínez-López et al. 2005). Petty and Cacioppo (1986) proposed the ELM to explain individual attitude change in terms of central route and peripheral route, based on the amount of information processing or individual demand for subject elaboration. The central route refers to critical thinking about task-related arguments and relative merits of forming judgment about a target behavior, while the peripheral route refers to an individual heuristic that relies on simple cues or inferences toward the target behavior without cognition. The ELM is uniquely suited to explore the "black box" of influence within the system acceptance context (Bhattacherjee & Sanford 2006). Accordingly, the TAM and ELM can complement each other to form a hybrid theoretical perspective.

MacCracken (1989) applied source credibility in spokesperson advertisements to provide an impartial opinion about the subject. Source credibility influences persuasion by altering or strengthening message processing (Stephenson et al. 2001). According to the ELM, peripheral cues motivate persons with a lower level of elaboration likelihood. Morris et al. (2005) proposed that an individual who focuses on peripheral cues, called cognitive misers, possesses stronger emotional responses than a cognitive elaborator. Employees who rely on trustworthiness and source credibility follow peripheral cues and emotionally evaluate messages. Bhattacherjee and Sanford (2006) suggested that peripheral cues, such as source credibility, are likely to influence human affect. Higher levels of credibility source stimulate employee curiosity, arouse imagination, and lead to employee exploration (Ahn et al. 2007). Combining messages with credibility source stimulates a more enjoyable experience toward system acceptance. Therefore,

H_1: Employees experiencing higher levels of source credibility of a persuasive message are more likely to perceive playfulness toward system implementation.

An individiaul who receives information from a credible source has positive cognition toward system acceptance (Chaiken & Maheswaran 1994). Source credibility may positively influence employee cognitive evaluation, such as perceived usefulness and perceived ease of use. Employees exposed to messages attributed to expert sources are more likely to think critically about the message and produce more favorable thoughts or counterarguments (Stephenson et al. 2001). However, if firms employ credible experts to strongly recommend the ease and use of a new system, employees may substitute their own thinking process with the expert's recommendation (Bhattacherjee & Sanford 2006). Sussman and Siegel (2003) found that source credibility positively influences consultants' perceived usefulness of an information system. Firms that provide source credibility with a persuasive message motivate employees to understand the usefulness and ease of use of technology, based on reliable expert recommendations. Thus,

H_2: Employees experiencing higher levels of source credibility of a persuasive message perceived higher levels of ease of use.

H_3: Employees experiencing higher levels of source credibility of a persuasive message perceived higher levels of usefulness.

Employees with a higher level of elaboration likelihood are inclined to scrutinize or process information carefully, and are thus influenced by argument quality. Message arguments are directed at the rational judgment of employees (Schroeder 2005). Employees following argument quality are likely to hold strong perceptions of information, assess the information presented, and think about available information though perceptions. Stephenson et al. (2001) argued that an individual who carefully scrutinizes a message will possess more arguments or thoughts. Argument quality results in learning message content, generates cognitive response, and produces dissonance-induced reasoning (Petty & Wegener 1998). By reinforcing or improving employees' extant beliefs about system acceptance, argument quality influences employee perceptions (Bhattacherjee & Sanford 2006). Accordingly, the argument quality of a persuasive message provides employees more chances to understand usefulness and ease of use of technology. Thus,

H_4: Employees experiencing higher levels of argument quality perceived higher levels of ease of use.

H_5: Employees experiencing higher levels of argument quality perceived higher levels of usefulness.

- **The influence of playfulness, perceived ease of use, attitude certainty, and behavior intention**

Research has addressed flow in explaining individual behavior or understanding human-computer interaction (Hsu & Lu 2004, Novak et al. 2000, Ilsever et al. 2007, Stewart 2009). Csikszentmihalyi (1990) defined flow as a state of consciousness experienced by individuals who are deeply involved in some event, object, or activity. People thus involved in an activity participate in it at great cost, for the sake of doing it. A common flow measure could be the level of playfulness of an activity, similar to the emotional response of pleasure from environmental psychology (Koufaris 2002). Playfulness is defined as "the extent to which an individual perceives an activity as enjoyable in its own right, apart from any performance consequence that may be anticipated" (Davis et al. 1992). Thus, playfulness can represent an employee flow experience or emotional response toward system acceptance.

Intrinsic motivation, such as playfulness, refers to an individual who performs an activity purely for enjoyment, while extrinsic motivation, such as perceived usefulness, refers to an individual who performs activities purely to achieve a valued outcome (Liaw & Huang 2003). Employees who experience more playfulness are more likely to sustain their participation and perceive the system to be easier to use, due to increased time spent interacting with it (Davis & Wong 2007). Davis et al. (1992) found that playfulness is one of the key drivers of behavioral intention to use computers. Ahn et al. (2007) indicated that playfulness results in enjoyment or cognitive absorption. Therefore, a playful experience has significant effect on employee perceived ease of use, attitude certainty, and behavior intention toward technology acceptance. Thus,

H_6: Employees experiencing higher levels of playfulness perceived higher levels of ease of use.

H_7: Employees experiencing higher levels of playfulness possess higher levels of attitude certainty.

H_8: Employees experiencing higher levels of playfulness possess higher levels of behavior intention.

- **Interrelationships among perceived ease of use, perceived usefulness, attitude certainty, and behavior intention**

Based on the assumption of TAM, perceived ease of use and perceived usefulness positively influence attitude, which in turn affects individual behavior intention. Several previous studies have empirically validated the relationship between perceived ease of use, perceived usefulness, and attitude across a wide range of organizational contexts (Venkatesh & Brown 2001, Venkatesh & Davis 1996, Schepers & Wetzels 2007). Shin (2009) suggested that perceived usefulness and perceived ease of use are the two most important factors in explaining system use. In TAM, individual belief determines attitude toward using a system and attitude leads to intention to use (Oh et al. 2009). Therefore, perceived ease of use and perceived usefulness influence an individual's attitude certainty.

As suggested by Robert and Henderson (2000), behavior intention is determined jointly by perceived usefulness and attitude toward usage. Since technology usage literature has widely explored attitude, this study extends attitude to attitude certainty. Attitude certainty refers to the extent to which people are convinced that the attitude they hold is correct (Rucker & Petty 2006). Attitude certainty is important because it shows that people sometimes reflect on how their attitudes have changed, and this reflection can affect the strength of underlying attitudes (Rucker & Petty 2006). More positive attitudes toward target behavior result in greater exploratory use of technology (Saade & Bahli 2005). Lee et al. (2005) and Yu et al. (2005) found that consumer attitude and perceived ease of use affect behavior intention. Although research has not thoroughly investigated the effect created by attitude certainty, studies suggest that attitude with a great deal of certainty more likely persists over time, and resists attempts to change that influence behavior. Thus,

H9: Employees perceived higher levels of ease of use possess higher levels of usefulness.

H10: Employees perceived higher levels of ease of use possess higher levels of attitude certainty.

H11: Employees perceived higher levels of usefulness possess higher levels of attitude certainty.

H12: Employees perceived higher levels of usefulness possess higher levels of behavior intention.

H13: Employees with higher levels of attitude certainty possess higher levels of behavior intention.

3 RESEARCH DESIGN AND METHODOLOGY

3.1 Measurement development

Advancing complex information systems requires considering crossing functional and organizational boundaries with business process reengineering. Enterprise resource planning (ERP) systems provide integrated software to handle multiple corporate functions including finance, human resources, manufacturing, materials management, and sales and distribution (Amoako-Gyampah & Salam 2001). Compared with traditional and simple systems, ERP represents a completely different class of technology application that is more consistent with the current business setting. Since this study investigated the influence of persuasive messages on employee system acceptance, firms adopting and implementing ERP systems were employed as our samples.

Measures were mainly adapted from previous validated questionnaires and minor modifications were made to fit the study context. This study developed, tested, and assessed reliability and validity in the absence of existing items and scales. The scale purification process was conducted following Churchill's (1979, 2002) suggestion. All the items were conducted on a seven-point Likert scale with anchors from strongly disagree (1) to strongly agree (7). Measurement items for each construct are

listed as follows. *Source credibility* was adopted from Bhattacherjee and Sanford (2006) and measured by the following items. The person providing ERP system training on this topic was knowledgeable, trustworthy, credible, experienced, and an expert. *Argument quality* was adopted from Bhattacherjee and Sanford (2006) and assessed by three items as follows. The information provided during the ERP system training session was informative, valuable, and persuasive.

Playfulness was a latent variable formed by the above two first order sub-dimensions (reflective indicators), including challenge arousal and skill/control. *Challenge arousal* was based on the study of Koufaris (2002) and Davis and Wong (2007). The items included: (1) Using this ERP system challenged me to perform to the best of my ability, (2) Using this ERP system provided a good test of my skills, and (3) Using this ERP system stretched my capabilities to the limits. *Skill /control* was assessed by two questions used by Koufaris (2002). The respondents were asked to indicate their level of agreement about dominance and capability while using this ERP system. Since playfulness is a formative measures construct, external validity was evaluated through two reflective items, including (1) I am deeply engrossed, and (2) I feel playful when I use this ERP system.

Perceived Ease of Use was assessed by three items as follows: (1) I find it is easy to use this ERP system to do my job, (2) It does not take long time to use this ERP system, and (3) I find this ERP system to be flexible to interact with. The items were based on Davis et al. (1989). *Perceived Usefulness* was measured based on Davis et al. (1989) and included four following items : (1) Using this ERP system improves my working performance, (2) Using this ERP system improves my working productivity, (3) Using this ERP system improves my working effectiveness, and (4) I find that using this ERP system is useful for my job. *Attitude Certainty* was measured based on the study of Bhattacherjee and Sanford (2006). The items were: (1) Using the ERP system in my job is a good idea, (2) Using the ERP system in my job is a wise idea, (3) Using the ERP system in my job is a pleasure, and (4) Overall, I like the idea of using the ERP system in my job. *Behavior Intention* was assessed by four items: (1) I intend to use the ERP system on my job in the near future, (2) I intend to use the ERP system for more of my job responsibilities, and (3) I believe it is worthwhile to use the ERP system for my job, and (4) I think it is necessary to use the ERP system for my job. The items were based on Davis et al. (1989).

3.2 Survey administration

Based on the construct measures discussed above, a questionnaire was developed for the survey of this study. Two panel discussions with three management professors, two experienced professionals responsible for ERP adoption and implementation, and ten Ph.D. management students, majoring in business administration, were conducted to discuss the appropriateness of the research questionnaire items. Preliminary survey instruments were developed based on the suggestions made by these persons, together with information gleaned from a review of the related literature. The questionnaire was pre-tested through a pilot study.

This study selected 1,600 firms as our sample frame from "The largest 1,000 manufacturing firms in Taiwan (2009)," "The largest service firms in Taiwan (2009)," and "The largest financial corporations in Taiwan" (2009), published by Common Wealth's Magazine. Two steps preceded delivery of the questionnaire to sampling firms: confirmation from the firms that they had adopted ERP systems, or introduced a new ERP module within the past three years. Because this study focused on employee system acceptance, it is difficult for employees to recall the acceptance situation. Introducing a new system can take a few months or even more than one year. After discussing with the experts, this study limited sampling firm implementation of the ERP system to within three years. Telephone calls were made and information from websites or newspapers was searched to screen out unqualified firms. Finally, 608 firms were selected as our sampling firms. Each company was approached at least two times to locate key persons to fill in the questionnaire. Given the scope of the research instrument, employees of the ERP project were enlisted to ensure representative opinions from different job

positions. One hundred and thirty questionnaires were returned, including seven incomplete questionnaires. Thus, 124 questionnaires were usable, resulting in a response rate of 20 percent.

The final sample included 47 percent of male respondents. Approximately 36 percent of the respondents were between 36 and 45 years of age, and more than 35 percent of the respondents had more than ten years of work experience. Approximately 45% of the companies belonged to traditional industries with histories of more than 16 years. Nearly 68 percent of the firms had more than 1000 employees. More than 59 percent of the firms operated on a comparatively large scale, with revenues of more than 200 million NTD. Non-response bias was tested. Early and late returned responses to surveys were compared to provide additional support for non-responses bias (Armstrong & Overton 1977). The t-tests yield no statistically significant differences (at the 99 percent confidence interval) between the early group and late group.

4 DATA ANALYSIS

4.1 Measurement model

Data analysis involves analyses of the measurement model and the structural model. All PLS analyses were performed using SmartPLS Version 2.0 (Ringle et al. 2005). This study assessed the significance level of indicators and path coefficients using the bootstrapping procedure with 500 sub-samples. One item from the construct of source credibility (SCI5) and one item from argument quality (AQI3) were dropped, if very small and insignificant item loadings were present (Chu et al. 2004). Table 1 shows that the loadings are in an acceptable range and the t-values indicate that they are significant at the 0.05 level. All of the composite reliability coefficients are above .70, suggesting that the measurements are reliable. In addition, each AVE is above the 0.5 threshold, thereby indicating that convergent validity for this exploratory study is adequate.

Construct/indicators	Scale type	Loading/weights1	S.E.	CR2	AVE3
First order factors					
Source credibility	Reflective			0.97	0.89
SCI1		0.93	61.51		
SCI2		0.96	105.72		
SCI3		0.93	62.55		
SCI4		0.95	76.82		
Argument quality	Reflective			0.95	0.91
AQI1		0.95	79.35		
AQI2		0.95	63.14		
Challenge arousal				0.94	0.85
AR1		0.94	63.00		
AR2	Reflective	0.94	71.07		
AR3		0.89	37.70		
Skill / control				0.93	0.87
AR4		0.94	92.32		
AR5	Reflective	0.93	78.21		
Perceived ease of use				0.93	0.81
PEOU1		0.92	58.83		
PEOU2		0.91	47.93		
PEOU3		0.86	28.95		

Perceived usefulness	Reflective			0.98	0.92
PU1		0.96	114.93		
PU2		0.97	178.55		
PU3		0.97	167.81		
PU4		0.92	51.10		
Attitude certainty	Reflective			0.97	0.88
AC1		0.93	47.53		
AC2		0.96	118.18		
AC3		0.93	50.17		
AC4		0.94	82.69		
Behavior intention				0.97	0.89
BI1	Reflective	0.95	72.00		
BI2		0.94	70.58		
BI3		0.95	95.56		
BI4		0.94	76.20		
Second order factors					
Playfulness	Formative			N.A.	N.A.
Challenge arousal		0.67	43.38		
Skill / control		0.37	30.10		

Note: 1 for reflective scales, the standardized loading is provided; for formative scales, the weight of the linear combination is given. 2 CR, composite reliability; AVE, average variance extracted, both are not applicable to formative scale. 3 N.A., not applicable.

Table 1. Factor Loadings and Reliability

Variable	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Source credibility	0.94							
Argument quality	0.73	0.95						
Challenge arousal	0.35	0.47	0.90					
Skill/control	0.70	0.67	0.74	0.96				
Perceived ease of use	0.66	0.66	0.72	0.67	0.90			
Perceived usefulness	0.49	0.71	0.32	0.76	0.70	0.96		
Attitude certainty	0.60	0.72	0.37	0.54	0.57	0.76	0.94	
Behavior intention	0.70	0.72	0.71	0.72	0.71	0.71	0.77	0.91
Mean	4.79	5.04	5.10	4.83	5.09	5.33	5.38	5.45
S.D.	1.16	1.14	1.04	1.16	1.15	1.14	1.05	1.09

Note: Diagonal elements are the square root of average variance extracted (AVE) of the reflective scales. Off-diagonal elements are correlations between construct.

Table 2. Correlations among Major Constructs

Table 2 provides evidence of sufficient discriminant validity, since the square root of the AVE is greater than all the inter-construct correlations (Sanchez-Franco and Roldan 2005). Table 3 also demonstrates the correlations between the indicators of the formative scales: the correlations are well below the cutoff value of 0.8. Therefore, multicollinearity problems are unlikely in our formative scales (Huang 2009). Because this study collected data from a single respondent in each responding firm, it is possible that common method variance will inflate the relationships among the variables in

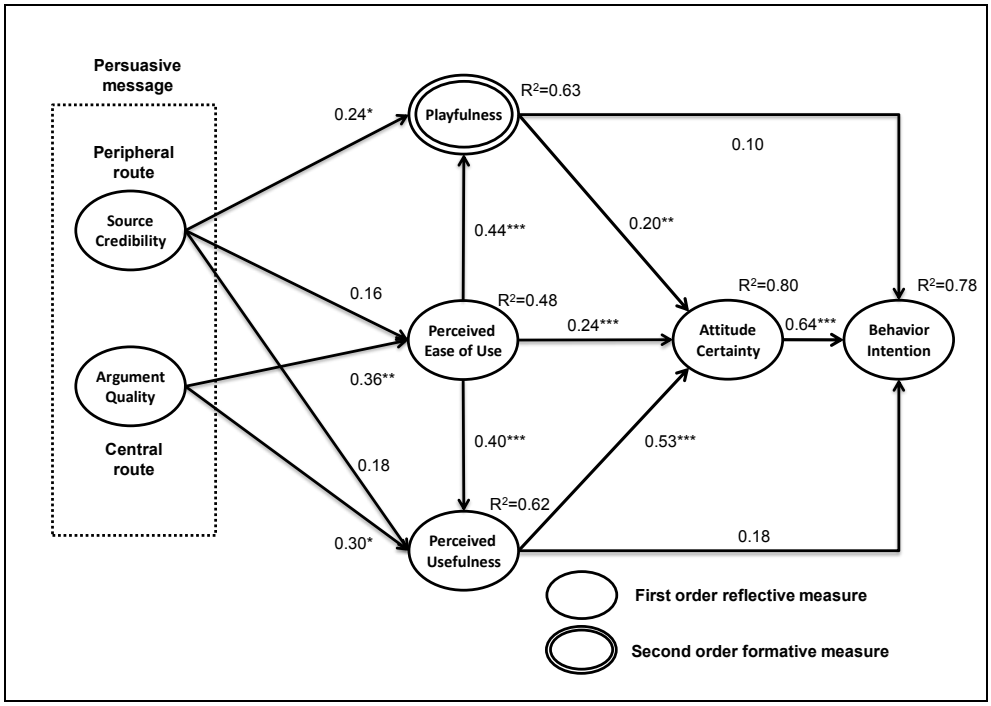
this study. Methodologically, this potential problem can be tested by the Harman's single factor test (Harman 1967). To complement the Harmon test, this study conducted an additional analysis outlined by Klein et al. (2007) and Liang et al. (2007). The results demonstrate that the average substantively explained variance of the indicators is 0.68, while the average method based variance is 0.025. The ratio of substantive variance to method variance is approximately 27:1. Most method-factor loadings are not significant, indicating that common method bias is unlikely to be a serious concern for this study.

4.2 Structural model

A summated score was saved for the construct of playfulness to preserve multiple aspects of a concept to estimate the entire model. Figure 2 presents the estimates obtained from PLS analysis. The variance explained (R^2) in the endogenous variables served as indicators of the PLS model quality. The research model demonstrates strong predictive power as the variance explained (R^2) in key endogenous constructs as 0.63 for playfulness, 0.48 for perceived ease of use, 0.62 for perceived usefulness, 0.80 for attitude certainty, and 0.78 for behavior intention. The findings show that our research model explains a large part of the variance in endogenous variables with an average global R2 of 0.66. Thus, overall fit of the model is good.

Figure 2 shows that source credibility of the persuasive message has significant influence on playfulness (β =0.24, $p<0.05$). The results indicate that when employees perceive persuasive induction with source credibility, they have higher levels of playfulness of the ERP system. However, source credibility of the persuasive message does not have significant influence on perceived ease of use (β =0.16, $p>0.05$) and perceived usefulness (β =0.18, $p>0.05$). The possible reason for the insignificant path from source credibility of the persuasive message to perceived usefulness may be that employees following a peripheral route tend to heuristically rely on simple cues. Those cues motivate positive thoughts, but do not lead to cognitive thinking. Persuasive messages influence users by diverting attention, reallocating cognitive resources, and evoking affective responses and behaviors (Tam & Ho 2005). Hence, H1 is supported, but H2 and H3 are not supported. Argument quality of the persuasive message has significant influence on perceived ease of use (β =0.36, $p<0.01$) and perceived usefulness (β =0.30 $p<0.05$). The results indicate that when a persuasive message for implementing an ERP system includes argument quality, it stimulates employees to perceive ease of use and usefulness of the ERP system. According to ELM, an individual with central route message processing engages in extensive elaboration by carefully scrutinizing messages, while an individual with peripheral route message processing relies on peripheral cues (Petty & Cacioppo 1986, Bhattacherjee & Sanford 2006). Therefore, H4 and H5 are supported.

Figure 2 shows that playfulness has positive and significant effect on perceived ease of use (β =0.44 $p<0.001$) and attitude certainty (β= 0.20, $p<0.01$), although no empirical support is found for the influence of playfulness on behavior intention (β= 0.1, $p>0.05$). As suggested by Lee et al. (2005), using an entertainment-oriented system for pleasure differs from the traditional task-oriented system for task accomplishment. Thus, H6 and H7 are supported, but H8 is not supported. In turn, perceived ease of use stimulates perceived usefulness (β =0.40 $p<0.001$) and attitude certainty (β =0.24 $p<0.001$). Furthermore, perceived usefulness has positive and significant effect on attitude certainty (β= 0.53, $p<0.001$), but has no influence on behavior intention (β= 0.8, $p>0.05$). Therefore, H9, H10, and H11 are supported, but H12 is not confirmed. The result contradicts the work of der Heijden (2004), that playful and perceived usefulness are determinants of behavior intention. The possible explanation for this phenomenon is that attitude certainty may play a mediating role in the relationship between playfulness-behavior intention and perceived usefulness-behavior intention. Finally, attitude certainty positively influences behavior intention (β= 0.64, $p<0.001$). This indicates that higher levels of attitude certainty result in higher levels of behavior intention, providing support for H13.



Note: *p<0.05, **p<0.01 ***p<0.001; playfulness is a second-order reflective measure construct

Figure 2. PLS Results for the Proposed Model

5 DISCUSSION AND IMPLICATIONS

This study applied flow theory to explain an individual's playful experience, but this theory mainly applies to the field of online behavior or web surfing rather than work settings. This study argued that employee system acceptance not only relies on cognitive response (perceived ease of use and perceived usefulness), but also on emotional response (playfulness). In addition, challenge arousal and skill control constitute playfulness. Thus, firms need to understand employee capabilities and design tasks that stretch employee capabilities to test their skills, so employees can experience confidence and enjoyment while implementing new system. Managers need to understand the information-processing route to deliver strategies to effectively motivate and persuade employees, leading to successful system implementation.

Many marketing scholars have noted that a persuasive message plays a critical role in the individual information elaboration process. One of the significant contributions of this study is to integrate the flow theory, and extend the ELM and TAM. To the best knowledge of the authors, this study presents the first empirical evidence to investigate the influence of persuasive message, including source credibility and argument quality, on employees' emotional, utilitarian, and functional responses toward implementing a new system. The results confirm that source credibility and argument quality help guide the creation of effective messages, and stimulate different types of responses. For employees possessing a higher level of elaboration likelihood, firms should provide relevant information with regard to the value, benefit, and advantage of the ERP system. A well-articulated message, and communicating useful arguments about system usage, may cause employees to perceive the usefulness and ease of using a new system. For employees with a lower level of elaboration likelihood, firms should provide expertise or experienced people who are trustworthy and credible for employees, since peripheral cues motivate those employees.

How the influencing route affects employee playfulness, perceived ease of use, and usefulness on attitude certainty and behavior intention is also important while implementing ERP systems. The results suggest that playfulness or perceived usefulness do not directly influence behavior intention,

except via attitude certainty. This finding offers insights for firms seeking to implement the ERP system. To enhance employee behavior intention, firms need to provide an environment, which can help employees perceive the usefulness of the ERP system or feel playful toward system implementation. Employees need to feel positive about implementing a new ERP system. Without a positive attitude, employees may not use the ERP system in their work.

Finally, the results argue that perceived usefulness is a stronger determinant for attitude certainty than perceived ease of use and playfulness. As proposed by Hsu and Lu (2004), delivering flow experience is time-consuming. Constructing an environment or delivering strategies to persuade employees to accept a new system is costly. Even though this study confirms the important roles of source credibility and argument quality of a persuasive message, central route strategies are more viable for implementing a new system, Since argument quality determines employees' perceived usefulness and it is a stronger determinant for attitude certainty than perceived ease of use and playfulness, managers can use central route strategies to provide accurate information about the job and relevant information about implementing a new system.

The research model proposed in this study may serve as a useful reference for further academic evaluation and practical justification. This study attempts to verify the comprehensive framework through both qualitative and quantitative approaches. Specifically, the research model sheds light on the influence of persuasive messages on employee playfulness, perceived ease of use, and perceived usefulness while implementing ERP systems. Managers should persuade employees to implement ERP systems through the peripheral route of playfulness or the central route of perceived usefulness and perceived ease of use to enhance their attitude certainty and behavior intention. Thus, these results can help practitioners make application to real world situations.

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