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Reexamining the Impact of System Use on Job Performance from the Perspective of Adaptive System Use

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ABSTRACT

Prior research with regard to the relationship between system use and job performance has been inconsistent. Some research found that system use has significant impact on job performance, as anticipated; other research does not confirm such a relationship. In this paper, we try to bridge this inconsistency by attributing this inconsistency to the simply conceptualized and measured system use construct. Subsequently, we introduce a "richer" conceptualization of system use, namely adaptive system use, and we examine its relationship with job performance. We suggest that adaptive system use accounts for a significant part of the impact of system use on job performance. Using a sample of 274 MS Office users, we were able to confirm that adaptive system use has significant impact on task productivity, management control, and task innovation. This research has implications for both research and practice.

Keywords

Adaptive system use, impact of system use, job performance, empirical study.

INTRODUCTION

Positive impact on job performance is one of the original goals of information systems. Individuals and organizations have strongly believed and long anticipated that information systems can enhance their task productivity, innovation, and management control, via proper and effective use. Therefore, it is to be expected that system use should strongly associate with the impact of information systems. Nevertheless, too often IS researchers found that system use has little or no impact on job performance. For instance, Goodhue and Thompson (1995) examined system use, task-technology fit, and their effects on job performance. Goodhue and Thompson's results showed that system use has a significant but smaller effect on performance than task-technology fit (TTF). Similarly, Guimaraes and Igbaria found that the impact of system use on performance is much smaller than that of management support (Guimaraes and Igbaria, 1997). In another study, Igbaria and Tan found a smaller impact from system use on performance than from user satisfaction (Igbaria and Tan, 1997). In the same vein, Pentland (1989) empirically found that system use and productivity were weakly associated. Furthermore, he suggested that researchers should resist the temptation to regard use as a proxy for system implementation success.

Despite the existing findings of the weak associations between system use and the impact of information systems on job performance, it is still too early to conclude that system use does not have or has little impact on job performance. Instead, this relationship needs to be reexamined with careful reconsiderations of the system use construct itself. In general, IS researchers agree that not only how much a system is used, but also *how* it is used, account for the impact of the system on one's job performance.

> *"The problem to date has been a too simplistic definition of this complex variable. Simply saying that more use will yield more benefits, without considering the nature of this use, is clearly insufficient. Researchers must also consider the nature, extent, quality, and appropriateness of the system use."* (DeLone and McLean, 2003 p. 16)

In summary, the current "amount" view of system use is insufficient for explaining the impact of ISs on job performance. As a result, IS researchers have called for a "broader conceptualization" of system use and its impact on job performance.

> *"… we propose that researchers broaden their perspective of system use from one that exclusively focuses on a narrow "amount" view of users' direct interaction with systems to one that also includes users' adaptation, learning, and reinvention behaviors around a system… The literature provides many examples showing the important influence that such behaviors have on IT implementation outcomes… with some researchers recommending the development of a broader conceptualization of IS use… The advantages of an expanded behavioral view of IS use include a more faithful representation of usage activities that users engage in,*

stronger links with salient outcome variables such as individual performance, and its applicability to both voluntary and mandatory usage contexts" (Benbasat and Barki, 2007 P.215)

The present research, applying a richer conceptualization of system use, namely adaptive system use (ASU) (Sun and Zhang, 2006), and studying its impact on individuals' job performance, is consistent with the above argument made by Benbasat and Barki. In this research, we demonstrate empirically that such a richer conceptualization of system use can overcome the limitation of the "amount" view of system use and can explain better the connections between system use and the impact of ISs on job performance.

CONCEPTUAL DEVELOPMENT

Many IS researchers have been questioning the simplicity of existing conceptualizations of system use (e.g., Benbasat and Barki, 2007, DeLone and McLean, 2003, Jasperson et al., 2005, Burton-Jones and Straub, 2006). The current conceptualizations of system use — such as the frequency, duration, or variety of system functionalities used — are believed inadequate for capturing the relationship between system use and the realization of expected results (DeLone and McLean, 2003, Benbasat and Barki, 2007). For instance, finding that system use as measured by the current and intended use did not predict performance as expected, Lucas and Spitler called for studies on "the nature of actual use and how to measure it" and "the relationship between use and performance" (Lucas and Spitler, 1999).

Aiming at a better understanding of the dynamic nature of post-adoptive system use, Sun and Zhang developed a new concept called adaptive system use and defined it as individual user's modifications of both the content (what features are used) and spirit (how these features are used) of one's features-in-use (Sun and Zhang, 2008, Sun and Zhang, 2006). Features-in-use refers to the features from a set of systems that are known to and ready to be used by a particular user (Sun and Zhang, 2008). A particular system can mean different things to different users, depending on what and how features are used by a particular user. In this sense, adaptive system use can be used to indicate a user's modifications of what and how features are used by him/her.

Adaptive system use is a multidimensional construct and includes dimensions such as trying new features (using a new features/features), feature combination (using two or more features together to perform a task for the first time), feature substitution (replacing a currently used feature with a new feature), and feature repurposing (using a feature in a way that is not intended by the developer (Sun and Zhang, 2008). These dimensions capture various behaviors through which a person modifies his/her use of information system at the feature level and jointly form one's adaptive system use.

RESEARCH MODEL

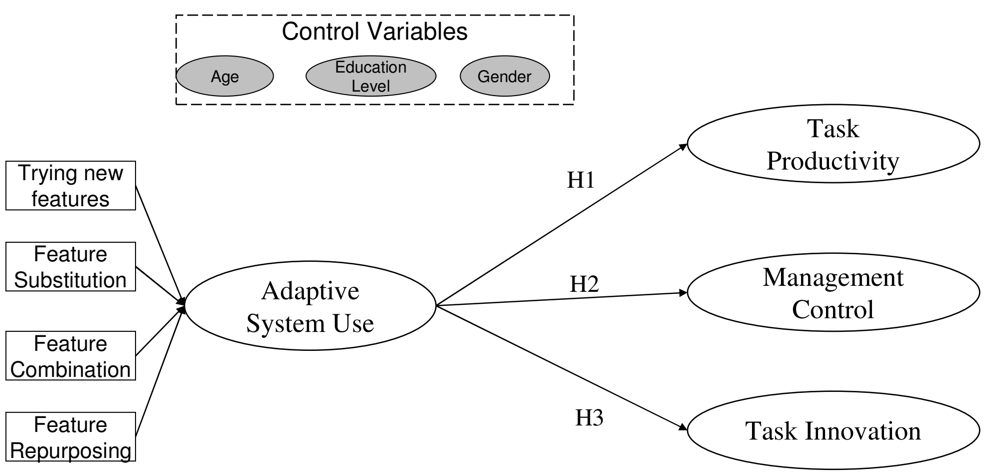

Figure 1. The Research Model

A growing number of IS researchers study the impact of IS on various aspects of organizational work, usually at the organization or industry level (Torkzadeh and Doll, 1999, Torkzadeh et al., 2005). It is only recently that systematic studies of IS impact at the individual level have started to accumulate (Torkzadeh et al., 2005, Jain and Kanungo, 2005, Igbaria and Tan, 1997). Based on a comprehensive review of existing literature, Torkzadeh and Doll proposed four explicit impact dimensions, which describe how an application impacts individuals in an organization context (Torkzadeh and Doll, 1999). These four impact dimensions include the impact of IS on *task productivity, management control, task innovation,* and *customer satisfaction*. As an empirically supported comprehensive coverage of the impact of system use, these dimensions provide a high-level categorization that is broad and applicable to most systems and contexts. A research model as depicted in Figure 1 is developed based on Torkzadeh and Doll's conceptualizations of the impact of IS on job performance. We link adaptive system use to three dimensions of job performance: management control, task productivity, and task innovation. We argue that adaptive system use affects all the three aspects of the User's job performance, as will be deliberated below. It is worthy to note that the fourth dimension in Torkzadeh and Doll's conceptualization, customer satisfaction, is excluded from our model since many IS users do not deal with customers directly.

Impact of ASU on Task Productivity

Task productivity is defined as "the extent that one application improves the user's output per unit of time" (Torkzadeh and Doll, 1999 p. 329). It has long been of keen interest to organizations and individuals. It is one of the major motivations of organization investment in information systems. The significant influence of information systems on productivity has been well documented by prior researchers (e.g., Liff, 1990, Tornatzky et al., 1990). By automating tasks that were previously handled manually, information systems help users save time on repeated and routine tasks. Users can thus allocate their time for other tasks. As a result, users can finish more tasks within the same period of time. In addition, using new technology, employees can be more skilled and thus can generate more outcomes within the same period of time, indicating an enhancement of task productivity.

Adaptive system use can help users enhance task productivity to cope with workload. Innovative activities such as actively rethinking and adjusting one's use of information systems have been seen by employees as a problem-focused strategy to cope with intensified task requirement (Janssen, 2000, Lazarus, 1966, Lazarus, 1991, Lazarus and Folkman, 1984, Parasuraman and Hansen, 1987). Innovative behavior may help the individual improve his or her fit with higher job demands by generating, promoting, and realizing ideas for modifying oneself or the work environment (Janssen, 2000). Adaptive system use — innovative in nature — might thus be able to help users cope with heavy workload via improving their task productivity. Modifying one's use of system features can lead to a broader collection of features and a better sense pertaining to how these features can be used to improve one's productivity. As a result, the user is more likely to use the features that are aligned with tasks better, which is critical for improving task productivity. In addition, adaptive system use can enhance users' ability to use ISs for different tasks, noted as extended use by Saga and Zmud (1994).

Unexpected events, such as performance problems, or disruptions, such as changes to task requirements, often trigger users' adaptation behaviors (Majchrzak et al., 2000, Tyre and Orlikowski, 1994). These events make users rethink their use of information systems and make adjustments if necessary (Louis and Sutton, 1991). Adaptive system use reflects modifications to one's use of system features in response to external triggers such as a new task, other people's use, discrepancies between what was expected and the outcome, and deliberate initiative (Sun and Zhang, 2008). It is reasonable to imagine that these modifications, addressing problems at work directly, usually lead to higher productivity. For instance, observing that the other person is using a feature that is more efficient in finishing a task (a trigger), a user may try this new feature and as a result enhance his/her task productivity. Therefore, compared to a user who always uses the same features in the same ways despite the changing environment and task requirements, a person who performs adaptive system use behaviors is more likely to find new system features or new ways of using system features and thus has more chance to enhance his/her task productivity. Adaptive system use results in a larger pool of candidate features or candidate ways of using system features for a particular user. After performing an adaptive system use behavior (e.g., trying a new feature), a particular user can always choose to go back to his or her "old" mode of system use if it turns out to be more efficient than the new mode[1]. In this sense, adaptive system use expands the potential options of system use for a user. He and she can choose whichever option that is more efficient, task wise. Therefore,

H1: Adaptive system use is positively associated with task productivity.

Impact of ASU on Management Control

Management control refers to "the extent that the application helps to regulate work processes and performance" (Torkzadeh and Doll, 1999 p. 329). Adaptive system use helps managers interact with their workforce better. First, information systems can help managers stay informed and communicate with their workforce and to be involved in decision-making process (Huber, 1990). Adaptive system use enriches this advantage by rendering more choices for information integration and for

[1] The notion of mode refers to the status of using system features at a particular point of time. It includes what features are used and how they are used by a particular user at a particular time.

communicating with others. For instance, a person using email as the only means of communication may find Windows Live Messenger attractive in communicating with other people synchronously and thus would like to give it a try. As a result, he/she has more ways of communication. Second, adaptive system use can help people record, integrate, track and retrieve management information better. Management itself is a complex processes and adaptive system use allows managers to find more effective ways to do this job. For instance, a manager may find and thus try an online scheduling function that can help track their employees' meetings and deadlines more effectively. As a result, he or she has a better idea about what is going on in the organization. Managers can also retrieve relevant information more quickly and thus can respond quickly to emergencies.

Another aspect of management control is monitoring one's own performance (Zuboff, 1988). Information systems provide many management control functions for scheduling and project management, among others. Through adaptive system use, a user is likely to find and try more effective management control functions or new ways of using them and subsequently better manage his or her work. Therefore, we argue that

H2: Adaptive system use is positively associated with management control.

Impact of ASU on Task Innovation

Individuals can always try new ideas at work, an activity referred to as task innovation (Torkzadeh and Doll, 1999). First, one of the basic functions of information systems is to provide new outcomes of work and new ways of doing work. For instance, information systems can be used to create new ways of interface with customers (Harvey et al., 1993 from Torkzadeh et al., 1999). Second, information systems allow users to enrich and broaden their jobs. Freeing workers to a great degree from routine jobs via enhancing the task productivity and improving management control, information systems give users more time, energy, and cognitive resources to learn new things at work and new ways of doing current work (Byrd, 1992). Third, adaptive system use allows users to learn from each other, which expands their ability to innovate. Information systems are usually designed based on a comprehensive understanding of the nature of work specific to them and such comprehension is from a survey over a large pool of potential users. Think about how MS Office might be developed based on a thorough investigation into the needs of the potential users for word processing (Word), creating and formatting spreadsheets (Excel), and presentation (PowerPoint), among others. As a result, MS Office integrates a wide range of ways of work from many people and can provide inspiring things for a user to find new ways of work. For instance, a user may find "Track Changes" function in MS Word and thus uses it for his/her work. He or she may have never done similar things before. In this case, adaptive system use (trying a new feature — "Track Changes") leads to task innovation (tracking changes). Therefore, adaptive system use provides a user with "windows of opportunity" to learn and try different features and new ways of using system features, which in turn can enhance one's capability and chance to be innovative at work (Tyre and Orlikowski, 1994). Fourth, adaptive system use expands the scope of system use for problem solving, which in turn leads to task innovation (Deng et al., 2008). Using information systems for problem solving is one of the major characteristics of using information systems. System use provides an information rich environment that helps users generate new ideas and helps them try out and assess rapidly the consequences of innovative ideas. Adaptive system use enriches and accelerates this innovation process. In sum, we argue that:

H3: Adaptive system use is positively associated with task innovation.

METHOD

Survey Administration

To test the hypotheses, an online survey was conducted to collect quantitative data. An online questionnaire was designed using ASP and MS Access. An invitation email with the URL of the online questionnaire was sent to 1500 administrative assistants from different organizations. A reminder email was sent one week later to boost the response rate. Gift cards of 50 dollars each were raffled as incentives. In the end, we received 274 usable responses, consisting of the final sample. Table 1 shows the demographics of the sample.

MS Office was selected as the technology for several reasons. First, users are more likely to exhibit adaptive system use behavior with a familiar system (Jasperson et al., 2005). Second, MS Office has a large collection of features and users have more flexibility in changing their use of features in MS Office. Third, the impact of MS Office on the individual's job performance has been well understood by its users.

To help situate subjects in the particular survey context, we asked subjects in the questionnaire to report an incident where they performed adaptive system use behaviors (e.g., trying a new feature in MS Office). They then answered the survey questions based on this incident.

Variables	Sample Composition	
Age	Mean = 37.72; std. dev = 9.80; range 22-63	
Gender	Female (150)	71%
	Male (62)	29%
Highest Education Level Attained	Graduate Degree	12.5%
	Some Graduate Work	4.8%
	University or College Degree	36.5%
	Some University of College	37.5%
	Secondary School or Less	8.7%

Table 1. Demographics of the Sample

Operationalization

Adaptive system use was measured using the instrument as described in Sun and Zhang's work (Sun and Zhang, 2008). Adaptive system use is an aggregate high-order construct that has four subconstructs: trying new features, feature substitution, feature combination, and feature repurposing. The instrument includes eighteen items, of these four are for trying new features, four for feature substitution, four for feature combination, and six for feature repurposing (Appendix A). Items for measuring the impact of IS on task productivity, management control, and task innovation were from Torkzadeh and Doll (1999) (Appendix A). A seven-point Likert scale was used for both adaptive system use and the impact constructs.

It is worth noting that adaptive system use is conceptualized as a formative construct. First, the four dimensions of adaptive system use — trying new features, feature substitution, feature combination, and feature repurposing — jointly form adaptive system use. In other words, the causality is from these four sub-constructs to adaptive system use. Second, the four dimensions of adaptive system use are not interchangeable; they are orthogonal. For instance, trying new features does not necessarily imply that features are also substituted, combined, or repurposed. Third, they do not necessarily co-vary as reflective items do. These conditions made us conceive adaptive system use as a formative construct (Petter et al., 2007).

ANALYSIS AND RESULTS

Content Validity of Adaptive System Use

The difference between reflective and formative measures merits mention at this point. The widely utilized approaches of testing reflective constructs are inappropriate for formative constructs (Petter et al., 2007). For instance, while multicollinearity is desired for reflective constructs because they are supposed to measures/reflect the same latent construct, it could be a problem for measures of formative constructs. Formative items should cover different aspects of the formative construct and thus should not be interchangeable. While reflective items are interchangeable, dropping one formative item can cause problems in construct validity (Diamantopoulos and Winklhofer, 2001). We took several measures proposed by Petter et al. to examine the construct validity of adaptive system use (Petter et al., 2007, Diamantopoulos and Winklhofer, 2001). First, all items were identified and refined in interviews with fourteen frequent users of MS Office, to ensure that the entire domain of adaptive system use was covered. Second, Q-sorting exercises following Moore and Benbasat's guidance (1991) were conducted to initially assess and improve the construct validity of adaptive system use. Third, to test the reliability of the measures of adaptive system use, we regressed adaptive system use on the four sub-constructs of adaptive system use and examined the VIF statistics (variance inflation factor). VIF should be smaller than 3.3 to ensure a satisfactory reliability of formative measures. As we can see in Table 2, the VIF statistics of the four sub-constructs of adaptive system use are all smaller than 3.3, indicating that multicollinearity is not present. That is, these four subconstructs cover different aspects of adaptive system use.

Model	Standardized Coefficients	t	Sig.	Collinearity Statistics (from SPSS)	
				Tolerance	VIF
Formative Construct: Adaptive System Use					
ASU1(Trying new features)	.222	89419.750	.000	.521	1.921
ASU2(Feature substitution)	.240	86583.093	.000	.418	2.390
ASU3(Feature combining)	.634	232323.702	.000	.431	2.319
ASU4(Feature repurposing)	.074	29892.088	.000	.528	1.896

Table 2. Construct Validities of Adaptive System Use

		ASU	TP	MC	TI
Adaptive System Use (ASU)	Trying new features	0.71	0.32	0.23	0.28
	Feature substitution	0.82	0.27	0.33	0.36
	Feature combination	0.95	0.36	0.36	0.40
	Feature repurposing	0.56	0.14	0.25	0.26
Task Productivity (TP)	TP1	0.37	0.92	0.73	0.81
	TP2	0.26	0.85	0.54	0.64
	TP3	0.31	0.78	0.53	0.55
Management Control (MC)	MC1	0.40	0.71	0.96	0.64
	MC2	0.23	0.53	0.90	0.45
	MC3	0.42	0.75	0.97	0.65
Task Innovation (TI)	TI1	0.25	0.55	0.43	0.81
	TI2	0.44	0.80	0.66	0.96
	TI3	0.42	0.78	0.59	0.97

Table 3. Cross—loadings

Constructs	CR	AVE	1	2	3	4
1. Adaptive System Use	n/a	n/a	n/a			
2. Task Productivity	0.89	0.73	0.37	0.85		
3. Management Control	0.96	0.88	0.38	0.71	0.94	
4. Task Innovation	0.94	0.84	0.42	0.79	0.63	0.92

Table 4. Composite Reliability (CR), Average Variance Extracted (AVE), and Discriminant Validity

Measurement Model

PLS (Partial Least Square) was utilized to examine the measurement model. As a component-based SEM (Structural Equation Modeling) technique, PLS takes into account simultaneously the structural paths (relationships between latent variables) and the measurement paths (relationship between latent variables and their indicators) (Chin et al., 2003). It is ideal for research models involving latent variables because it does not assume the monotone relationships between latent variables and their indicators.

Using PLS, we evaluated the item loadings, reliability coefficient, and convergent and discriminant validities of the measurements of the research model. The criteria are as follows. First, Individual item loadings greater than 0.7 are considered adequate (Fornell and Larcker, 1981). Second, the composite reliability — interpreted like a Cronbach's alpha for internal consistency reliability estimation — should be no less than .70 to be considered acceptable (Fornell and Larcker, 1981). Third, measuring the variance captured by the indicators relative to measurement error, the average variance extracted (AVE) should be greater than .50 to justify using a construct (Barclay et al., 1995). Fourth, to achieve satisfactory discriminant validities, items should load more strongly on their own constructs in the model, and the average variance shared between each construct and its measures (measured by squared roots of AVE) should be greater than the variance shared between the construct and other constructs (correlations) (Compeau et al., 1999).

Tables 3 and 4 show the results of the measurement model testing. The loadings and cross-loadings are in general satisfactory. Feature repurposing has a low loading of 0.56 to its primary construct, adaptive system use. However, we retain it because adaptive system use is a formative construct and keeping this dimension can preserve content validity (Bollen and Lennox, 1991). Table 4 indicates that the measures have satisfactory composite reliabilities and all AVEs are greater than the suggested threshold of 0.5. In addition, the average variance shared between each construct and its measures (diagonal elements in Table 4) are greater than the variance shared between the construct and other constructs (off diagonal elements in Table 4), indicating sufficient discriminant validities.

Structural Model

Path coefficients and R squares are the criteria for examining structural models using PLS. The results are summarized in Figure 2. As expected, adaptive system use has significant impact on task productivity, management control, and task innovation. Hypotheses 1 through 3 are thus supported. Adaptive system use alone explains 15.2% of the variance in task productivity, 17.6% in management control, and 13.9% in task innovation respectively.

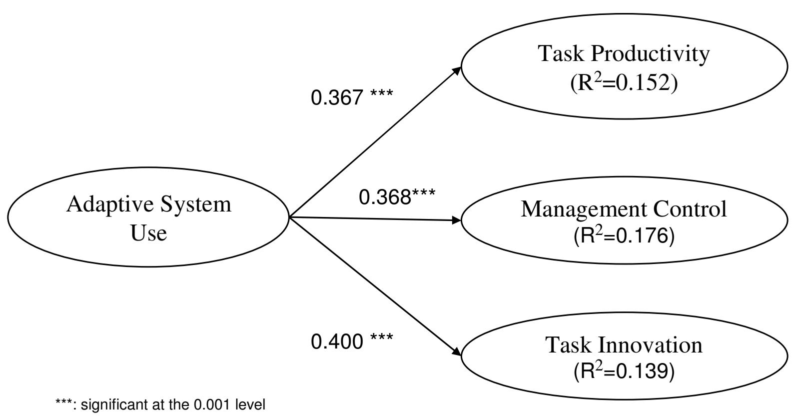

Figure 2. Results of the structural model

Some people may conceive of the impact of IS on job performance as a latent variable that has three reflective subconstructs. This conception results in a model as depicted in Figure 3. Compared to the decomposed model in Figure 2, this new model is parsimonious and has different theoretical implications (Petter et al., 2007). In this model, impact of IS on job performance is a high-order multidimensional construct that has three dimensions: task productivity, management control, and task innovation. As we can see in Figure 3, adaptive system use affects the impact of IS on job performance significantly and explains 19.2% of its variance. Nevertheless, we cannot say which model, the original model (Figure 2) or the new model (Figure 3), is better because they are different in nature, contingent upon how one conceptualizes the impact of IS on job performance.

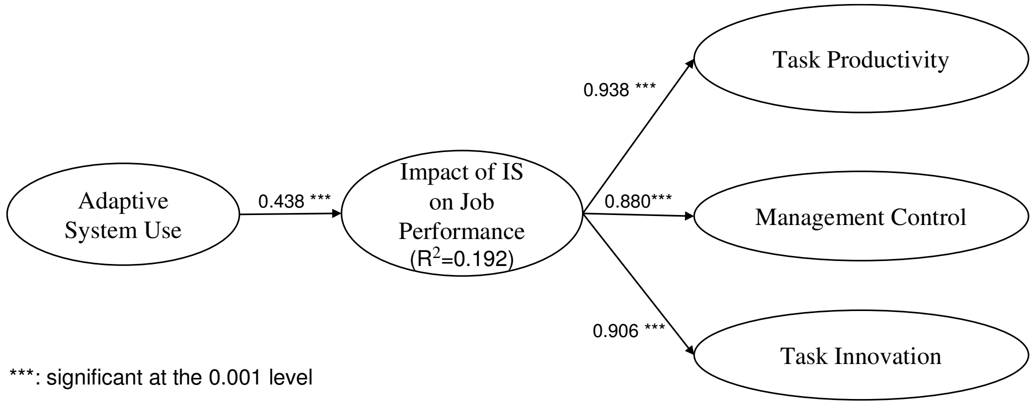

Figure 3. Results of the post hoc analysis

DISCUSSION

The impact of IS on job performance is of keen interest to IS researchers and practitioners. System use is believed to be the mediator between IS and the impact of IS: only when systems are used can their benefits be realized. Prior IS research, however, suggested that system use does not impact one's job performance as expected. One of the reasons, we believe, is the simplicity of existing conceptualizations of system use (although we are by no means denying the importance of other factors in affecting job performance). New conceptualizations of system use need to be investigated (Burton-Jones and Straub, 2006). In this study, we proposed and studied a new concept called adaptive system use and we examined its impact on job performance. Using a sample of 274 users of MS Office, we found the significant impact of adaptive system use on task productivity, management control, and task innovation. That means, using information systems adaptively can have profound impact on various aspects of job performance.

This research has limitations. First, we tested only one type of information system. Testing the research model in different technological contexts is necessary to achieve a thorough understanding of the research model. Second, the organizational context of the sample was not controlled effectively. The subjects were from various organizations. Organizational context might have impact on the dependent variables in the research model too and thus might threat the internal validity of our research model. Third, although a sample size of 274 is traditionally acceptable for IS research, especially for studies using PLS techniques, it is far from being sufficient. Considering the users of MS Office applications that are culturally and geographically diverse, larger samples in different cultural contexts are desired. Fourth, the self-reporting measures may be biased.

Adaptive system use does not always lead to positive outcomes such as higher productivity, more effective management control, and more task innovation. Adaptive system use is innovative behavior and that may affect work and life negatively. For instance, an innovative use of information systems may result in peer conflicts: co-workers and supervisors may resist a new way of using a system because of people's tendency to avoid the insecurity and stress surrounding changes, because of habits and preferences for familiar practices and actions, because of a propensity to avert cognitive dissonance, and because of interest and commitment to the established framework of theories and practices of using system features (Janssen, 2004, Janssen et al., 2004). The negative effects of adaptive system use could actually be an interesting topic for future research.

The present research contributes to IS research in several ways. First, the conceptualization of adaptive system use enriches our understanding of postadoptive system use. Despite its importance, system use has not received sufficient attention as it should have (Burton-Jones and Straub, 2006). The exclusive focus on the amount or extent of use as the dependent variable has "blinded researchers to other salient user behaviors" such as reinvention and learning (Benbasat and Barki, 2007). We need new conceptualizations and empirical examinations of system use (Burton-Jones and Straub, 2006, Jasperson et al., 2005). In this sense, this study enriches our understanding of system use and provides empirical evidence of postadoptive system use. Adaptive system use is developed following Burton-Jones and Straub's guidance on selecting conceptualizations of system use. adaptive system use is different from prior conceptualizations in that it is descriptive and quantified. Some studies have been done to enrich our understanding of system use, such as "nature of IS use" (Jain and Kanungo, 2005) and "quality of use" (Auer, 1998). Concepts of this kind contributed to our understanding of post-adoptive system use. However, most of these studies use evaluative measures, which are not system use per se (Burton-Jones and Straub, 2006). If one is to measure system use, the researcher must "quantify it, not evaluate it." (Burton-Jones and Straub, 2006 p.232). To our knowledge, adaptive system use is the first descriptive conceptualization of system use that receives empirical confirmations.

Second, we reexamined the impact of IS on job performance at the individual level. As one of the "core properties" of the IS discipline (Benbasat and Zmud, 2003, DeLone and McLean, 1992), the impact of IS use on job performance at the individual level receives less attention than it should do (Benbasat and Barki, 2007). The present study empirically examined the relationship between adaptive system use and the impact of IS on job performance.

For practitioners, findings from our research means that we need to pay more attention to the dynamics in postadoptive system use. Users may modify their use of information systems regarding what and how features are used and such modifications can have significant impact on job performance. This presents unique challenges to design research and design theorizing.

Finally, we should caution readers that there is more than one way to conceptualize system use (Burton-Jones and Straub, 2006). By no means are we implying that adaptive system use covers the entire domain of post-adoptive system use. Instead, adaptive system use was developed because it was believed to relate to job performance. To study postadoption system use, one must realize the object of the research and develop or choose the appropriate conceptualization and measurement of system use accordingly. As a result, new conceptualizations from different perspectives may emerge.

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APPENDIX A: INSTRUMENTS

Adaptive System Use: (measured by seven point Likert Scale: 1 strongly disagree, 4 neutral and 7 strongly agree)

Trying new features	TN1	I played around with features in Microsoft Office
	TN2	I used some Office features by trial and error.
	TN3	I tried new features
	TN4	I figured out how to use certain Office features
Feature substitution	FS1	I substituted features that were used before
	FS2	I replaced some Office features with new features
	FS3	I used similar features in place of the features at hand
	FS4	I did not hesitate to use a feature because it was favored over the one I was using
Feature combination	FC1	I generated ideas about combining features in Microsoft Office I was using
	FC2	I combined certain features in Microsoft Office
	FC3	I used some features in Microsoft Office together for the first time
	FC4	I combined features in Microsoft Office with features in other applications to finish a task
Feature repurposing	FR1	I applied some features in Microsoft Office to tasks that the features are not meant for
	FR2	I used some features in Microsoft Office in ways that are not intended by the developer
	FR3	The developers of Microsoft Office would probably disagree with how I used some features in Microsoft Office products
	FR4	I used some Office features in a way at odds with its original intent
	FR5	I invented new ways of using some features in Microsoft Office
	FR6	I created work-a-rounds to overcome system restrictions

Impact of IS on Job Performance: (measured by seven point Likert Scale: 1 strongly disagree, 4 neutral and 7 strongly agree)

Task Productivity	TP1	Microsoft Office saves me time
	TP2	Microsoft Office increases my productivity
	TP3	Microsoft Office allows me to accomplish more work than would otherwise be possible
Management Control	MC1	Microsoft Office helps management control the work process
	MC2	Microsoft Office improves management control
	MC3	Microsoft Office helps management control performance
Task Innovation	TI1	Microsoft Office helps me create new ideas
	TI2	Microsoft Office helps me come up with new ideas
	TI3	Microsoft Office helps me try out innovative ideas