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A Study of How User Satisfaction and User Dissatisfaction Affect the Success of an Information System

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Abstract

Information System implementation can truly be considered as a "success" when a significant number of users have used the Information System (IS) on a continued basis. The lack of continuous use of an Information System has been identified as one of the major causes for IS project failure. The reason for the lack of an IS continuous use is due to its inability to satisfy users and to avoid user dissatisfaction. While many studies have investigated user satisfaction, user dissatisfaction seems to be ignored in IS literature. The purpose of this study is to investigate the factors that influence user satisfaction and the factors that influence user dissatisfaction. A study of the literature along with a qualitative study was conducted to explore these factors. The qualitative study was conducted by interviewing staff from a tertiary institution, who continually use an Enterprise Education System to support teaching. The results suggest that it is important not only to make users satisfied but also to avoid user dissatisfaction.

Keywords

IS Continuous Usage, IS Continuance, User Satisfaction, User Dissatisfaction, Confirmation of Expectation

1. Introduction

The success of an Information System (IS) can be measured at different life times of its implementation. According to the literature, Information System Implementation can truly be considered as a "success" when a significant number of users have moved from an initial adoption to using the Information System on a continued basis (Bhattacherjee 2001, 2004; Cheung & Limayem 2005; Davis & Venkatesh 2004). Past studies emphasized that IS success depends on a continued use rather than first time use (Bhattacherjee 2001; DeLone & McLean 1992; Shaw 2002; Wixom & Todd 2005; Zhang & Dran 2000). In fact, the lack of an IS continuous use is shown by previous research to be the main cause of failure for IS projects (Cenfetelli & Benbasat 2003; Parthasarathy & Bhattacherjee 1998).

Past IS studies have mainly focused on the factors that influence users to begin to use the system**.** These are shown in extended studies of technology adoption and technology acceptance (Chen et al. 2004; Chiasson & Lovato 2001; Jones et al. 2002; Venkatesh et al. 2003; Wixom & Todd 2005). Bhattacherjee (2001) was the first researcher to propose a Post-Acceptance Model for IS Continuance. His model seeks to explain a users' intention to continue using the system. Although his model is considered to be the most widely cited and influential model in explaining an IS continuance intention (Centefelli & Benbasat 2003; Cheung & Limayem 2005; Koppious et al. 2005), it is incomplete in explaining the use of the system for a particular group of users, most particularly, users who are employees in an organization, using the system to perform their jobs. This is because his model emphasizes satisfaction as the main reason causing the users' intention to continue using the system. He does not consider the impact of user dissatisfaction on a user choosing to discontinue using the system (Centefelli & Benbasat 2003; Shaw 2002). Bhattacherjee assumed that user satisfaction is simply the opposite of user dissatisfaction. However, past studies on job satisfaction and job dissatisfaction have shown that this may not be completely true as past study showed that eliminating employee dissatisfaction does not improve satisfaction (Herzberg 1966). Currently, there are no IS studies that investigated both the factors that influence user satisfaction and the factors that influence user dissatisfaction. There might be a possibility that employees will continue/discontinue or increase/decrease the use of the system depending upon whether they are satisfied or dissatisfied with the system. Therefore, to increase the continuous use of the Information System, maximizing user satisfaction and avoiding user dissatisfaction is crucial.

The purpose of this study is to investigate the factors that influence user satisfaction and the factors that influence user dissatisfaction over time in the use of an Information System. Our two main research questions investigated the use of an Information System over time are

1. What factors influence user satisfaction?
2. What factors influence user dissatisfaction?

The ability to answer the above research questions will create an understanding of how to maximize user satisfaction and to avoid user dissatisfaction among particular groups of users, with an overall aim of increasing the continuous use of an Information System.

2. Theoretical Background

To answer the above research questions, the literature for satisfaction, dissatisfaction in IS studies and other related studies will be reviewed. The theoretical base underlying the study has drawn upon Expectation Confirmation Theory (Oliver 1980), Post-Acceptance Model of IS Continuance (Bhattacherjee 2001), DeLone-McLean Model of IS Success (DeLone & McLean 1992) and Satisfaction-Dissatisfaction Theory (Herzberg 1966).

2.1 Satisfaction

The importance of satisfaction is illustrated in the studies of consumer behaviour, job satisfaction and Information System Success. In consumer behaviour studies, satisfaction has shown its importance on a person to continue purchasing products/services while satisfaction causes employees to maximize their self-actualization to achieve high job performance in a job satisfaction studies. In Information System studies, satisfaction causes a user to use the system. Satisfaction was initially defined by Locke (1976, p. 1300) in the job performance context as "a pleasurable or positive emotional state resulting from the appraisal of one's job". This definition was later extended by Oliver (1980) to the consumption context as the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the prior feelings of consumers about the consumption experience. Both definitions emphasize an affective state resulting from a cognitive appraisal of the confirmation of expectation. That is, lower expectation and/or higher performance lead to greater confirmation, which later influence customer satisfaction and continuance intention while the reverse causes disconfirmation, dissatisfaction, and discontinuance intention. Oliver (1980) emphasized the importance of satisfaction in consumer consumption behaviour by initially proposing the Expectation Confirmation Theory (ECT), an original theory demonstrating a process of post-purchase behaviour of consumers (Anderson & Sullivan 1993; Dabholkar et al. 2000; Oliver 1980, 1993; Patterson et al. 1997; Tse & Wilton 1998). According to Oliver, the process starts with consumers forming an initial expectation of the service prior to purchase, then, accepting and using the service. During an initial consumption, consumers forming perceptions about its performance against their original expectation and determine the extent to which their expectation is confirmed. Consumers are then satisfied. Last, satisfied consumers form a repurchase intention while dissatisfied consumers discontinue its subsequent use.

2.1.1 Satisfaction in IS Studies

Satisfaction has shown its importance on a user to intend to use an Information System. These are shown in the studies of IS continuance intention (Bhattacherjee 2001; Bhattacherjee & Premkumar 2004). Studies of IS success have shown that satisfaction strongly influences users in their use of the systems (DeLone & McLean 1992; Ginzberg 1981; Wixom & Todd 2005). In the studies of an IS continuance intention, Bhttacherjee (2001) has extended the Expectation Confirmation Theory to propose a Post-Acceptance Model of IS Continuance. This model accounts for the individual intention behaviour for the continued use of an Information System. According to Bhattacherjee, IS continuance intention is determined by satisfaction and perceived usefulness, while satisfaction is also predicted by perceived usefulness and confirmation. Bhattacherjee found that satisfaction and perceived usefulness are highly affected by the user's expectation being met. That is, the better the expectations are met, the more useful and the more satisfied the users are. His model implies that user will be satisfied if their expectations about the system are met and they will be dissatisfied if their expectations are not met. His model also implies that while satisfied users intend to continue using the system, dissatisfied users intend to discontinue their use of the system. However, the implication from Bhattacherjee's model is incomplete in explaining the factors that influence user satisfaction. First, Bhattacherjee's study investigated only one expectation, perceived usefulness. It is argued that perceived usefulness alone cannot explain the change of other usage-related expectations (e.g., usability, compatibility, resource constraints). Second, while his model implies that users will be satisfied if their expectations about the system are met, other studies showed that there can be different types of satisfaction and not all of them are caused by the confirmation of expectations. For example, Stauss & Neuhaus (1997) proposed three types of customer satisfaction and reported that each type influences customer behaviour to repurchase a product/service differently. These are demanding

customer satisfaction, stable customer satisfaction and resigned customer satisfaction. According to Stauss & Neuhaus, demanding satisfied customers are customers who are willing to continue satisfying the relationship if they have positive experiences with a product/service that they expected and if the supplier is able to satisfy their rising expectations. Stable satisfied customers want everything to stay as it is because the positive experiences encourage them to continue the relationship. Resigned customers are customers whose satisfaction are not caused by the fulfilment of expectations but are based on the impression that it is unrealistic to expect more. Stauss & Neuhaus report that although they all describe themselves as satisfied customers, their continuous behaviour are completely different. In the job studies, satisfaction was measured by the evaluative feeling about the job. That is, the better the employees feel about their job (feeling good), the more they were satisfied with their job (Herzberg 1966). The measurement of user satisfaction about the use of an Information System by combining both the confirmation of expectations proposed in the consumer behaviour studies and the factors that make users feel good proposed in the job studies, have not yet been investigated in the IS studies.

In the studies of IS success, several researchers have suggested user satisfaction as an effective measure of IS success (Ginzberg 1981; Parthasarathy & Bhattacherjee 1998; Wixom & Todd 2005). When the use of an Information System is required, the successful interaction by management with the Information System can be measured in term of user satisfaction (DeLone & McLean 1992). Among these researchers, Ginzberg (1981) was one of the very first IS researchers to adopt user satisfaction as a measurement of IS implementation success and failure. His study showed a connection between realism of expectations and satisfactions and suggested that users who hold realistic expectations prior to an IS implementation are more satisfied with the system and use it more than users whose pre-implementation expectations are unrealistic. However, the main limitations of Ginzberg's findings are the lack of implication of which specific expectations are the most central to the users' satisfaction and whether these expectations will be changed over time. If there are changes of expectations over time in the use of an Information System, there is a possibility that these changes might have an influence on the change of user satisfaction. The lack of an examination for the change of user satisfaction over time in their use of the system motivates us to propose the first research question.

R1: What factors influence user satisfaction over time in the use of an Information System?

2.2 Dissatisfaction

Dissatisfaction has shown its importance on a continuous behaviour in consumer behaviour studies and Information System usage studies. In consumer behaviour studies, Oliver (1980), in his Expectation Confirmation Theory, proposed that dissatisfaction occurs when the customer expectations are not met, and dissatisfaction will later cause customers to discontinue using the services/products.

2.2.1 Dissatisfaction in IS Studies

Past IS studies suggested that user dissatisfaction occurs when the user expectations are not met. The importance of user dissatisfaction impact on the IS discontinuance/rejection (Parthasarathy & Bhattacherjee 1998). However, there are only few IS studies which assumed that there are particular factors that cause user dissatisfaction. This is because most IS studies assumed that user dissatisfaction is simply the opposite of user satisfaction (Bhattacherjee 2001; Bhattacherjee & Premkumar 2004). Particularly, a current Post-Acceptance Model of IS Continuance proposed by Bhattacherjee (2001), implies that the users will be dissatisfied if their expectations are not met and these dissatisfied users will later intend to discontinue using the system. However, the main criticism of Bhattacherjee's study is it assumed that user dissatisfaction and user satisfaction are simply the opposite dimensions. This may not be completely true as past study showed that eliminating employee dissatisfaction is not the same as making employees more satisfied (Herzberg 1966). In IS literature, dissatisfaction has been found to give different consequences from satisfaction on users to continue using the system (Cenfetelli & Benbasat 2003).

User dissatisfaction has been defined as a direct function of the expectation-reality gap (Parthasarathy & Bhattacherjee 1998). Parthasarathy & Bhattacherjee (1998) reported the importance of user dissatisfaction on a user continuous behaviour to continue using the online subscriber. Their study showed that later adopters are more likely to discontinue the online service due to dissatisfaction rather than the replacement of the new service. However, their investigation is limited to the customers who use an online subscriber and might not be able to generalize to the employees who use the system in a job context. The factors that cause user dissatisfaction was later investigated by Cenfetelli & Benbasat (2003). Cenfetelli & Benbasat applied Herzberg's Satisfaction-Dissatisfaction theory, to examine the website factors that lead to user dissatisfaction and their impact on a continuous usage behaviour. They reported that usability factors cause user dissatisfaction and make them discontinue using the website. However, their study has a number of limitations. First, their study was conducted with any customers who use an e-commerce to purchase a product. It is argued that the factors that influence the customers in purchasing a product over an e-commerce might be different from the factors that influence the users in using the system in performing their job. Second, their study lacked an investigation of whether the factors that cause user dissatisfaction will result in making users more satisfied.

This investigation is important as previous studies show the relationship between user satisfaction and the use of the system (Ivari 2005; Shin 2003; Wixom & Todd 2005). If the elimination of user dissatisfaction is not the same as making users more satisfied, eliminating the factors that cause user dissatisfaction might not guarantee the use of the Information System. Third, the study did not examine whether user dissatisfaction will be changed over time in the use of an Information System. Although there are no IS studies which examine the change of user dissatisfaction over time in the use of an Information System particularly in a job context, the importance of dissatisfaction and their impact on a continuous behaviour has clearly been shown in consumer behaviour studies. Stauss & Neuhaus (1997) proposed two types of customer dissatisfaction and reported that each type impacts customer behaviour to repurchase a product/service differently. These are "demanding dissatisfied customers" and "stable dissatisfied customers". According to Stauss & Neuhaus, demanding dissatisfied customers are the customers whose dissatisfaction can be depicted by an active aspiration level and demanding behaviour. On the emotional level, their dissatisfaction will result in protest and become active in requiring the product/service improvements. On the other hand, the stable dissatisfied customers are the customers with their dissatisfaction influenced by the performance of the service. Their dissatisfaction will be because their expectations will not be fulfilled now and in the future either. Past studies also reported that the constant change in user expectation over time causes the factors that increase user satisfaction to be the factors that only can eliminate user dissatisfaction (Ma & Qi 2005; Zhang & Dran 2000). These users might be demanding dissatisfied users as they continue demanding for service improvements. Our study proposes that if there are changes of expectation over time in the use of an Information System, there is a possibility that these changes might impact user dissatisfaction. In the job studies, dissatisfaction was measured by the evaluative feelings about the employee job, that is, the worse the employees feel about their job (feeling bad), the more they dissatisfied with their job (Herzberg 1966). The measurement of user dissatisfaction in the use of an Information System by combining both the confirmation of expectations proposed in the consumer behaviour studies and the factors that make users feeling bad, proposed in the job studies, have not yet been investigated in the IS studies. The lack of an examination for the change of user satisfaction over time in their use of the system motivates us to propose the second research question.

R2: What factors influence user dissatisfaction over time in the use of an Information System?

3. Research Methodology

Our study aim is to investigate, "the factors that influence user satisfaction and the factors that influence user dissatisfaction in the use of an Information System" and "the change of user satisfaction and user dissatisfaction from one period to another". Our study is conducted with a qualitative approach as this approach is descriptive, allowing focus on the processes, the meanings and the understanding gained through in-depth discussions with the subjects (Creswell 1994, Yin 2002).

3.1 The Study Context

Our study context is "an organisation within which an Information System being used to support the work of employees". This study was conducted at a leading Australian University in late 2006 with the Information System called "Blackboard". "Blackboard" is an Enterprise Information System that supports teaching for academic staff. To generalize our findings to the population of users, both technology-literate and non-technology literate subjects were targeted. All subjects were involved in voluntarily using the system.

3.2 The Development of the Interview Questions

The interview questions were developed to investigate the factors that influence user satisfaction and the factors that influence user dissatisfaction. We measured user satisfaction and user dissatisfaction by the confirmation of user expectations and by evaluating their feeling about the use of the system. The subjects were asked two sets of questions. The first set of questions were about the user expectations and the confirmation of these expectations. The second set of questions were about the factors that caused the subjects to feel good (satisfaction) or feel bad (dissatisfaction). Our study proposes that users will be satisfied if their expectations are met and they feel good about using the system. In contrast, they will be dissatisfied if their expectations are not met and they feel bad about using the system.

3.2.1 The Investigation of User Satisfaction and User Dissatisfaction from the Confirmation of User Expectations

The first set of questions focused on the subject's expectations about the use of the system and the confirmation of these expectations. These questions are required because previous studies showed that the level of user satisfaction and user dissatisfaction is correlated to the confirmation level of user expectations (Ginzberg 1981, Snajna & Scamell 1993). To further investigate whether there are any changes of user satisfaction and user dissatisfaction from one period to another, all subjects were asked these questions to

reflect on two historical periods in their use of the system. These two periods were at the first semester of using the system and in the current semester of using the system. The following interview questions were asked:

- What are your expectations about the use of the system before using the system in your first semester?
- Were your expectations confirmed at the end of the first semester?
- What are your expectations about the use of the system in the current semester?
- While continue using the system in the current semester, were your expectations confirmed over time?

3.2.2 The Investigation of User Satisfaction and User Dissatisfaction from the Evaluative Feelings about the Use of an Information System

The second set of questions focused on the factors that influence satisfaction and the factors that influence dissatisfaction in the use of the system. There are three main reasons for asking these questions. The first is that previous studies for the dimensions of satisfaction and dissatisfaction have measured employee satisfaction and employee dissatisfaction in relation to the evaluative feelings about their jobs, good feelings relate to satisfaction and bad feelings relate to dissatisfaction (Herzberg 1966). The second reason is to compare whether the factors that influence satisfaction and the factors that influence dissatisfaction from the evaluative feelings answered in this second set of questions are the same as the confirmation of expectations answered in the first set of questions. The third reason is that there might be the unexpected factors being brought up after the use of the system that might also make users satisfied or dissatisfied. As described earlier, all subjects were asked these questions to reflect on two historical periods in their use of the system. These two periods were at the first semester of using the system and in the current semester of using the system. The following interview questions were asked:

- What made you feel good about the use of the system in the first semester?
- What made you feel bad about the use of the system in the first semester?
- What makes you feel good about the use of the system in the current semester?
- What makes you feel bad about the use of the system in the current semester?

3.2.3 Pilot Test

We first conducted a pilot test to validate our interview questions. The purpose of the pilot test was to obtain feedback from the subjects as to whether our interview questions were clear and understandable. The results from the pilot test were then used to tailor the interview questions. The results of the pilot test were not included in the final results of our study. The pilot test was conducted by face-to-face interviews with four subjects. Each interview lasted approximately one hour. These subjects consisted of two technology literate users and two non-technology literate users. All subjects had been using the system for four years. By conducting this pilot test, we found some limitations of our initial interview questions. We found that by asking "What are your expectations about the use of the system?", the answer obtained from the two technical users was "good user interface". This answer limited our investigation of how much the system features can support the subjects to perform their jobs. Therefore, we refined the first set of questions based on the subject replies by also asking "Why do you think a good interface design will help you in performing your job?". Another limitation was by asking "What made you feel good/feel bad about the use of the system?", the answer obtained from one non-technical subject was "ability of the system to enhance teaching and learning". This answer had limited an investigation of what the particular system features were that could help the subjects perform their jobs. Therefore, we also refined this question by asking "What are the system features that help you enhance teaching and learning?"

3.3 Data Collection

We started data collection by selecting the subjects from the faculty of Information Technology and the faculty of engineering. These faculties were selected as they represented the subjects who were technology-literate. We then select subjects from the faculty of business and the faculty of education. These faculties were selected as they represented the subjects who were non technology-literate. To ensure that each individual in these faculties has an equal chance of being selected, a stratified random sampling was used. This was done by having a list of academic staff arranged by faculties using a staff directory from a university website and randomly selected the staff from each faculty. The selected subjects were then contacted by e-mail/telephone and were asked if they had been using the system and willing to participate. Twenty subjects were willing to participate. Then, the face-to-face interview was conducted with these subjects using the revised interview question. Each interview lasted approximately one hour and was audio taped for transcription and analysis. During the interview, we found that some questions needed further refinement and elaboration. These were based on the subject replies to gain further insight into the "thinking" of the subjects. For example, some subjects found difficulties in answering the question "What make you feel bad about the use of the system?". The researcher then tried by asking "How do you feel about using the system?". This is to make the subjects feel more comfortable with the questions and to gain an in-depth answer. However, the researcher also attempted not to ask a question which might guide the subjects' answer and might bias the findings. To also consider time as an important factor in measuring user satisfaction and user dissatisfaction, the subjects were asked to report the number of semesters/years that they had been using the system. The subjects' experience ranged from six months to eight years and seventy five percent of the subjects had been using the system for at least three years. The demographics of the subjects are shown below.

Table 1: The demographics of the interviewed subjects

Faculty/School	**Numbers of subjects**		**Usage period (numbers of subjects)**	
Technology literate users	**Male**	**Female**	**Male**	**Female**
Faculty of Information Technology	5	6	3 years (1) 4 years (3) 6 years (1)	1 year (1) 2 years (1) 3 years (1) 4 years (2) 5 years (1)
Faculty of Engineering/ Computing	1	0	1 semester (1)	
Non Technology literate users				
Faculty of Business/ Leisure, Sport and Tourism	4	2	5 years (1) 6 years (1) 7 years (1) 8 years (1)	4 years (2)
Faculty of Engineering/ Environmental	1	0	1 semester (1)	
Faculty of Education	0	1	3 years (1)	

3.4 Data Analysis

A content analysis was used to interpret the results and to reduce the data and guide the detailed interpretation of the data. This was done by taking the large amount of data and reducing it to certain categories and patterns and then interpreting this data. We started the data analysis by obtaining the data on "what influence user satisfaction?" and "what influence user dissatisfaction?". We then sorted the data into "categories" and "patterns". These categories were "the factors that influence user satisfaction", and "the factors that influence user dissatisfaction" referring to the two historical periods in their use of the system. We classified the two main factors from the "interview question" set and the "key words" reported by the subjects during the interview. These factors were "system quality" and "the abilities of the system to support the subjects to perform their jobs". The patterns in our study were "the change of the factors that influence user satisfaction between these two periods" and "the change of the factors that influence user dissatisfaction between these two periods". The patterns catered for the situation where one satisfaction factor might move from another, or one factor might remain the same. Then, we formatted this information into a story and wrote the qualitative text to explain our findings.

4. Analysis of Result

Our findings showed that "there are changes to the factors that influence the subject satisfaction over time". At the first semester of using the system, the major factors that made subjects satisfied were "the system quality" and "the system abilities to support the subjects in performing their jobs". For system quality, "easy to use" was the most reported factor to make the subjects satisfied. This was reported by 7 subjects. In addition, "good system management" was the second most reported factor (reported by 4 subjects). Examples of "good system management" include "the system should accumulate all needed data", "the system functions and teaching materials should all be in one system". Other system qualities reported were "good interface design", "user friendly", "high system security and reliability" and "adequate support" (but each of these system qualities was only reported by one subject). For the system abilities to support the subjects in performing their jobs, "the ability of the system to communicate with the students" was the most reported factor to make subjects satisfied. This was reported by 6 subjects. We also found "the ability of the system to help the student learning" to be the second most reported factor (e.g., the ability of the system to encourage student discussion, to help students learn depth knowledge and to faster addressing student issue). This was reported by 3 subjects. In addition, "the ability of the system to enhance teaching" was also reported by 2 subjects (e.g., the abilities to obtain faster feedback from students, to have more effective learning experience).

However, we found that "the system quality" and "the system abilities to support the subjects in performing their jobs" are inadequate to influence the subjects' satisfaction over time as there are new factors being brought up during interviews as a long term influence on their satisfaction. This new factor is "the ability of the system to support the subjects learning and extend their knowledge". This factor was found to be the most reported factor to influenced subjects satisfaction in the current semester. This was reported by 7 subjects. These factors were the ability of the system in "providing good learning experience", "enhancing the way to manage the system", "helping the subjects to get better at using the system", "helping the subjects to see the possibility of technologies in teaching" and "adding learning value and helping subjects to learn new functions". This finding was also correlated with the findings for the new factors of the "system quality" in the current semester. That is, "the continuous improvement of the system" was found to be the most reported factor in the current semester. This was reported by 10 subjects. These system improvements were "continually adding and upgrading system features" and "the system performance has gone beyond expectations". The subjects described that they were satisfied with the system because they see "the continuous improvement of the system after obtaining feedbacks". We also found some system quality factors have decreased their importance over time. For example, "easy to use" and "good system management" were reported to influence subject satisfaction in the current semester but has decreased its importance over time (reported by 5 subjects and 3 subjects respectively in the current semester but were reported by 7 subjects and 4 subjects respectively at the first semester). In addition, "the ability of the system to support the subjects in performing their jobs" was also still reported to influence subject satisfaction in the current semester but had decreased its importance over time. We found "the ability of the system to communicate with the students" and "the ability of the system to help student learning" were made users satisfied in the current semester but have decreased its importance over time (reported by 3 subjects and 2 subjects respectively in the current semester but were reported by 6 subjects and 3 subjects respectively at the first semester). Our findings further showed that the majority of the subjects were satisfied over time if the satisfaction factors existed from the first semester and there are the new satisfaction factors found over time (reported by 12 subjects). However, some subjects were satisfied over time if there are satisfaction factors existing from the first semester (reported by 5 subjects). Another important finding is "there are the changes to the factors that influence satisfaction for the same subject over time". The new factors found to make the same subject satisfaction over time were also be "the continuous improvement of the system" and "the ability of the system to support the subject learning and extend their knowledge". We found 3 subjects reported the change from "easy to use" at the first semester (from 7 subjects who reported this factor at the first semester) to "the continuous improvement of the system" in the current semester. In addition, 2 subjects reported the change from "good system management" (from 3 subjects who reported this factor at the first semester) to "the continuous improvement of the system" in the current semester. In addition, 3 subjects reported the change from "the ability of the system to communicate with the students" at the first semester (from 6 subjects who reported this factor at the first semester) to "the continuous improvement of the system" in the current semester. An example of an interview from a user who expressed her satisfaction with the system illustrates this.

"Over the last six years, I am very happy with the system because I can see the richness of student discussion through using the system which help them explore their knowledge with other students, the system make me feel that there are more possibilities of the technologies in teaching and learning environment. I can feel that my knowledge and skills with a technology are getting better over time after exploring different system functions and I never thought that the system even make me getting closer to my students".

This interview illustrated that the subject was satisfied with the system over time because the system can support her learning and extend her knowledge by continue improving its system features. The ability of the system to perform beyond her expectations is also an important factor to make her satisfied.

The major factors that influence user dissatisfaction appear to be the quality of the system related to "the system administrative factors". It is interesting that there seems to be no change of the factors that influence the subject dissatisfaction over time. This finding is a major difference to the factors influencing user satisfaction. 10 subjects reported the factors that made them dissatisfied at the first semester were also the same factors that make them dissatisfied in the current semester. These factors were "hard to use" (reported by 3 subject), "time consuming" (reported by 2 subjects), "poor user interface design" (reported by 2 subjects), "frustration with the system" (reported by 1 subject), "anxiously" (reported by 1 subject), "poor thread management" (reported by 1 subject). Although there seems to be no change of the factors that influence the subject dissatisfaction, we also found the new factors to influence the subject dissatisfaction in the current semester. This factor was "inadequate support". This was reported by 2 subjects, who described that they had difficulties obtaining support and that there was no continuous support from the technical support team. Another important finding, "time consuming" was found to increasingly influencing a subjects' dissatisfaction over time. This is because we found 2 subjects who reported "the difficulties in using the system" and "poor user interface design" from the first semester found "time consuming" to be the factor that make them dissatisfied in the current semester of using the system. An example of an interview from one user who expressed her dissatisfaction with the system illustrates this.

"Since I started using the system till now, I am still anxious about how to effectively enter student grade into the grade function. Currently, it is very time-consuming to upload each student grade and I found no one in my department could help me. I felt that if I ask the technical support, I will make them feel that I am pushing them. So, I waited until the technical support sent an e-mail offering an assistance. After obtaining an assistance, I wrote a clear steps of entering student grade into a system and gave everyone in my department".

This interview illustrated that there were users who need assistance over time. Without any help from the technical support team, these users can be dissatisfied due to their inabilities to effectively use the system. This interview suggested that it is important to continue providing assistance to the users over time. We also found that there were fewer subjects reported the factors to influence their dissatisfaction from the confirmation of expectations than from an evaluative feeling at the first semester of using the system. Thirty percent of the subjects reported their dissatisfaction from the confirmation of expectations while seventy percent reported from an evaluative feeling.

5. Discussion and Implications

Our study found the main factors that influence user satisfaction are "the system abilities to support user in performing their jobs" and "the system abilities to support user learning and extend their knowledge". Particularly, the system abilities to support user learning and extend their knowledge kept being brought up during interviews as a long term influence on user satisfaction. These findings support the findings from the literature described earlier. The findings that the system ability to support users in performing their jobs make them satisfied is supported by Bhattacherjee (2001), who reported that perceived usefulness, the benefit of the system to the users in performing particular tasks, has an influence on user satisfaction over time in their use of the system. This can be explained by a task-technology fit theory, which suggests that an Information System will have a positive impact on the task performance when the system provides features and support that fit the task requirement (Goodhue & Thompson 1995). Our finding implies that this positive impact on the performance of the task will later lead to user satisfaction. In addition, the finding that user satisfaction is also influenced by the system abilities to support user learning and extend their knowledge is supported by previous study on the factors that cause employee satisfaction with their job (Herzberg 1966) and the study on the factors that cause user satisfaction with their use of the website (Zhang & Dran 2000). Although both studies reported the factors that support employees/users learning and extend their knowledge make them satisfied, these studies did not investigate whether these satisfaction factors will be robust over time. While Zhang & Dran found user expectations was the most individual difference factor reported to affect user judgments from the factors that cause user satisfaction to the factors that only can eliminate their dissatisfaction when perceived time impact, our study reports different findings. We found that as time passed, all satisfaction factors reported from our study do not change to the factors that only can eliminate user dissatisfaction. Our findings show that although most users keep demanding for the improvement of the system over time, they also still expect the existences of the previous factors that cause them satisfied earlier to stay as they are. This can be explained by people nature are always looking for improvement and more demanding (Zhang & Dran 2000) but also want everything to stay as it is because of the positive experience made up to now made them willing to continue their relation (Stauss & Neuhaus 1997), in this case, a satisfying relation. In addition, the main factors that influence user

dissatisfaction found from our study are the system administrative factors. These major factors are "hard to use", "time consuming" and "inadequate support". The findings that few users were reported their expectations before using the system might be because they do not know what to expect from the system. We also reported that users were dissatisfied with the system, particularly at an initial usage stage, mainly because of the unmet expectations and poor (unexpected) system performance. These findings are partially supported by previous IS research. Snajna & Scamell (1993) reported that most users have unrealistic expectations prior their use of the system and these expectations become more realistic after using the system. In addition, a study by Ginzberg (1981) showed that users who hold realistic expectations prior to an IS implementation are more satisfied with the system and use it more than users whose pre-implementation expectations are unrealistic. Comparing our result with these studies, an interesting pattern emerged for explaining the reasons that caused user dissatisfaction at an initial usage stage. Previous study showed that most users have unrealistic expectations prior to using the system (Snajna & Scamell 1993) while our study showed that few users reported their expectations before using the system. This implies that the unmet expectations can be caused by the users hold on unrealistic expectations prior using the system. Consequently, these unmet expectations make users dissatisfied with their use of the system. The findings from our study that the dissatisfaction factors remain unchanged over time point out that it is important to maintain user realistic expectations over time in their use of the system.

6. Conclusion

This study identified the factors that influence user satisfaction and the factors that influence user dissatisfaction over time in the use of an Information System. The study identified factors from the literature and found support for these factors through an exploratory qualitative study. Our findings have an important implication to both IS practice and IS research. Knowing the factors that influence user satisfaction and the factors that influence user dissatisfaction provides an awareness to IS management. IS management need to have effective IS strategies to maximize user satisfaction and to avoid user dissatisfaction to increase the use of an Information System over time. This can be implemented by continually providing regular training with the updated knowledge of the system abilities in maximizing user job performance. The in-house development team should also continue developing/improving the system functions that can maximize user job performance and can support them in learning new knowledge and extending their skills. In addition, knowing that users are dissatisfied with the use of an Information System because their expectations are not met, urges IS management to continue providing user training and providing adequate support over time. This can also be implemented by showing an accurate picture for the abilities of the system prior to the use of the system and during the early use of the system. Our findings also have identified factors not considered in the current Post Acceptance Model of IS Continuance proposed by Bhattacherjee (2001). The antecedents of satisfaction and perceived usefulness proposed by Bhattacherjee is inadequate and incomplete in explaining IS continuous usage intention. This is because there are three new findings from our study. First, we found a new factor which influences user satisfaction over time. This factor is "the system abilities to support user learning new knowledge and extending their skills". Second, user dissatisfaction was also found to be an important factor in the use of the system. Third, there were changes to user satisfaction while user dissatisfaction remains unchanged over time. Our findings pointed out the importance of both satisfaction and dissatisfaction on the use of an Information System over time. The results from our study suggest the expanding of the current Post Acceptance Model of IS Continuance by adding the new factors, which influence user satisfaction and user dissatisfaction.

However, our study has certain limitations. First, this study was conducted as a preliminary investigation derived from the literature studies, therefore, the result from this study are not conclusive. A further, more rigorous quantitative study is planned as the next stage of this study. Second, the level of satisfaction and dissatisfaction measured from our qualitative study might not be completely accurate. We measured user satisfaction/dissatisfaction by asking the users "What made you to feel good/bad about the use of the system?". However, there might be different levels of "good feelings" or "bad feelings". To obtain the different levels of satisfaction and dissatisfaction, future researcher should instead asking "How do you feel about the use of the system?" In addition, to increase an accuracy of this item measurement, we recommended future research to be conducted with a quantitative study using different scales of user satisfaction and user dissatisfaction. Third, few users who continue using the system over many numbers of year had difficulties to recall their memory at their first use of the system, this create a validity problem because as the length of time interval for which the subjects are asked to report increase, there is the likelihood of memory failure and memory reconstruction (Weis, 1986). To avoid this problem, future research should provide an adequate time frame. The fourth limitation is that all interviewed subjects in our study are university staff. This might limit the generalizability of the results. It is recommended that future research select subjects from different industries and positions. For an over all aim of increasing the use of an Information System, we recommend future research to apply the factors that influence user satisfaction and the factors that influence user dissatisfaction found from our study to further investigate their influence on the use of an Information System.

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