

FACTORS AFFECTING USER SATISFACTION OF ACCOUNTING INFORMATION SYSTEMS: THEORETICAL APPROACH

NHÂN TỐ ẢNH HƯỞNG ĐẾN SỰ HÀI LÒNG CỦA NGƯỜI SỬ DỤNG HỆ THỐNG THÔNG TIN KẾ TOÁN: TIẾP CẬN LÝ THUYẾT

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Abstract - Being an important part of management information system, a well-developed accounting information system (AIS) would contribute greatly to an organization's operational efficiency. Since "user satisfaction" has been widely used as an important measure of information system, the research focuses on explaining and identifying the factors affecting user satisfaction of AIS. The research method in this study is the review process of the study of Creswell (2003) and qualitative methodology with expert interview. The results indicate that there are four factors directly affecting user satisfaction of AIS, namely: information quality, system quality, staff quality and perceived usefulness of users. This research also finds the relationships among these factors, which include those between system quality and information quality, user's perception and system quality and quality of accountant staff and information quality. The results of the study will create a premise for the implementation of empirical research.

Key words - Accounting information system; user satisfaction; success; factor; model.

1. Introduction

Accounting Information System (AIS), an important part of management information system, has the function to collect and process accounting data and other related data to create useful financial information.

AIS involves in most management processes, from planning to execution, control, analysis and decision making. AIS also connect to other functional information systems such as finance, manufacturing, sales, and human resources, etc. Thus, a successful AIS has been a goal of each organization.

However, determining whether an AIS implementation is successful has been a new theme since the conception of AIS became popular. In fact, it is not easy to identify and quantify the AIS success because of the complex, interdependent and multi-dimensional nature of AIS success.

Until now, there are few studies, both theoretical and empirical, on evaluating AIS in particular. On the other hand, there have been many researches on information system (IS) success in general.

Among several indicators of IS success, Delone & Mclean (1992) pointed out three factors explaining the reasons why user satisfaction has been widely used to indicate the success of IS. The first is the direct relationship between users' level of satisfaction and the quality of IS. With the purpose of providing users with information, the IS cannot be successful if users are unsatisfied with the given information. The second is the development of measurement tools for user satisfaction, allowing researchers to create reliable and appropriate scales of measure. The third is the limitation of other tools to measure the quality of IS.

Tóm tắt - Là bộ phận của hệ thống thông tin (HTTT) quản lý nên hệ thống thông tin kế toán (HTTTKT) được thiết kế tốt sẽ góp phần quan trọng trong việc nâng cao hiệu quả của tổ chức. Xuất phát từ việc "sự hài lòng của người sử dụng" trở thành thước đo quan trọng trong việc đo lường HTTT, nghiên cứu này sẽ giải thích và nhận diện các nhân tố tác động đến sự hài lòng của người sử dụng HTTTKT. Nghiên cứu sử dụng phương pháp "review" của Creswell (2003) và nghiên cứu định tính với việc phỏng vấn các chuyên gia. Kết quả có 4 nhân tố tác động đến sự hài lòng của người sử dụng là: chất lượng thông tin, chất lượng hệ thống, chất lượng đội ngũ và nhận thức về tính hữu ích của người sử dụng. Nghiên cứu cũng chỉ ra quan hệ giữa chất lượng thông tin và chất lượng hệ thống, nhận thức của người sử dụng và chất lượng hệ thống, chất lượng đội ngũ và chất lượng thông tin. Kết quả nghiên cứu sẽ tạo tiền đề cho việc thực hiện các nghiên cứu thực nghiệm tiếp theo.

Từ khóa - Hệ thống thông tin kế toán; người sử dụng; thành công; nhân tố; mô hình.

AIS is IS within the enterprise, so it is possible to apply prior researches related to IS success to evaluate AIS, notably through user satisfaction of the system. Although there are quite some studies on user satisfaction of accounting information, studies about user satisfaction of AIS in particular, at present, are few (Choe, 1996; Huynh & Nguyen, 2013). To fill the gap in the literature, this study's target is first to present an overview regarding IS user satisfaction and then explain and identify the factors impacting user satisfaction of AIS.

2. Literature Review

Scholars first studied on user satisfaction on IS in 1960s. At that time, although the theory of user satisfaction was not conceptualized, gap between user needs and information IS supplies was demonstrated to affect the success of IS.

Ives, Olson & Baroudi (1983) defined the concept of user information satisfaction (UIS) as a mechanism to assess the extent of users' belief in the ability of IS to meet their information requirement. Later, some IS researchers apply this notion when considering the idea of "meeting requirements".

Later, many IS scholars realized that research on behaviors linked significantly to the user satisfaction construct (Baroudi Olson & Ives, 1986; Doll & Torkzadeh, 1988; Wixom & Todd, 2005). End user computing satisfaction is regarded as the users' affection through direct interaction to a computer application (Doll and Torkzadeh, 1988). Chin and Lee (2000) affirmed that user satisfaction with an IS as the overall affective evaluation and end-user is related with his or her experience in the IS.

DeLone and McLean (1992) reviewed the effect of system quality and information quality on both user satisfaction and system use, which are interdependent. In 2003, DeLone and McLean supported their findings by adding an antecedent of user satisfaction - service quality.

System quality attributes aligned with the quality of information processing system, evaluated by system flexibility, system reliability, response time, integration, convenience of access (DeLone and McLean, 1992, 2003; Petter, DeLone and McLean, 2008). Information quality attributes shown in reports and queries include relevance, accuracy, completeness, understandability, timeliness, etc. Finally, service quality attributes focused on the quality of IS function's service (DeLone & McLean, 2003, Petter *et al.*, 2008) and included accuracy, responsiveness, reliability, technical competence and empathy of the staff.

Many scholars have tested the model of DeLone and McLean (1992). In 2005, Wixom and Todd suggested that system quality and information quality as antecedent to user satisfaction. Similarly, service quality was considered as an antecedent to user satisfaction with e-services (Xu *et al.*, 2013). On the other hand, after testing the relationships between overall user satisfaction and system quality and information in the model, Seddon and Kiew (1996) believed that the antecedent perceived usefulness instead of system use, while noting that it is only appropriate for a process model, not for a casual model.

In brief, previous research has figured out several factors that are consistent determinants of user satisfaction. However, it is clear that some inconsistencies occur among determinants because of the variability across different studies and contexts. (Sabherwal *et al.* 2006).

3. Research methods

The research method in this study is the review process outlined by Creswell (2003) and the qualitative methodology with expert interview technique. First, Creswell's (2003) review process is used to revise the extant literature on user satisfaction of IS and AIS. This study uses a list of keywords: user satisfaction, information systems, IS success, AIS to search for relevant documents in traditional and electronic libraries (Proquest, Science Direct, and Google Scholar). After carefully screening the studies resulted from the search, the author has performed an overall analysis on the theory of IS user satisfaction in general and of AIS user satisfaction in particular.

Next, the qualitative methodology with expert interview technique is used. The author has done 30 face to face interviews with Chief Accountants or Financial Directors of 30 enterprises in Danang city, Vietnam to explore their opinions regarding the factors affecting their satisfaction of the AIS used in their firms. As these interviewees are users of AIS with in-depth knowledge and experience, their insights about AIS satisfaction are valuable. Finally, such expert opinions, along with the theoretical background generated from Creswell (2003) review process, have allowed the author to develop the model of factors affecting user satisfaction of AIS.

4. Research results

4.1. The suggested model of factors affecting AIS user satisfaction

There have been a number of international studies on factors affecting user satisfaction of IS, such as DeLone and McLean (1992, 2003), Seddon and Kiew (1996), Iivari (2005), Halawi *et al.* (2007), Petter *et al.* (2008), Ilias and Razak (2011), Nguyen *et al.* (2014), Karlinsky-Schichor & Zvivan (2016), Jason *et al.* (2016)... There are some researches on user satisfaction of IS in the case of Vietnam such as Nguy and Pham (2013), Nguyen (2012), Nguyen (2015), Huynh and Nguyen (2013).

The extant literature suggests that there are 6 groups of factors that can affect user satisfaction of IS, namely: information quality, system quality, service quality, system use, perceived usefulness and staff quality.

Information Quality: Information quality can be defined as the information relevant to information user (Wang *et al.*, 1998). IS provides information, thus information quality is the most essential factor when assessing IS user satisfaction (Ives *et al.*, 1983; Iivari, 2005). 15/16 researches during the period of 1992-2007 show that information quality strongly impacts IS user satisfaction (Petter *et al.*, 2008).

System Quality: System quality relates to factors demonstrating the technical aspect of the system. Many scholars assert that system quality has a strong relationship with user satisfaction (DeLone & McLean, 1992, 2003; Iivari, 2005; Halawi *et al.*, 2007; Leclercq, 2007; Nguyen *et al.*, 2014; Karlinsky-Schichor & Zvivan, 2016; Jason *et al.*, 2016).). In fact, all 21/21 empirical studies from 1992 to 2007 indicate that user satisfaction is closely related to system quality (Petter *et al.*, 2008).

Service Quality: Service Quality is the quality of support that users receive from IS department and IT support personnel. Even though several researchers have examined the relationship between user satisfaction and service quality, the results are inconsistent.

System Use: System use is the level and method that employees and customers use the functions of an IS (Petter *et al.*, 2008), evaluated by criteria such as: number of use, frequency of use, nature of use, relevance of use, level of use and purpose of use... (DeLone & McLean, 1992, 2003; Chiu *et al.*, 2007; Halawi *et al.*, 2007). Surprisingly, few researches have examined the relationship between use and user satisfaction.

Perceived Usefulness: Perceived Usefulness is the extent to which user realizes the advantage of a certain system in his or her work (David, 1998). In other words, it is the perception or feeling of users about the role of the IS in supporting decision making, improving productivity, increasing revenue, reducing cost, creating jobs, generate work comfort, saving time, etc. There is a significantly positive relationship between perceived usefulness and user satisfaction (DeLone & McLean, 1992; Seddon & Kiew, 1994; Hsieh & Wang, 2007; Leclercq, 2007; Nguyen *et al.*, 2014; Karlinsky-Schichor & Zvivan, 2016),

Staff Quality: Staff quality relates to technical capability, skills and experience of system operators. There

are only a few researches that examined the impact of staff quality on user satisfaction (Zhang *et al.* 2005; Nguy and Pham; 2013; Karlinsky-Schichor & Zvivan, 2016).

Those studies provide a number of suggestions about factors influencing user satisfaction of IS. However, there have been limited research that focus on user satisfaction of AIS, especially in Vietnam when the view that AIS regarded as an IS is relatively new. To fill this gap in the literature, this research aims to build a theoretical model to study factors affecting AIS user satisfaction.

On one hand, since AIS is a management information system, the characteristics of IS documented in the extant literature can apply to AIS in some ways. On the other hand, AIS have special features and different functions, the users of the system have different requirements compared to other systems such as e-commerce, knowledge management systems, computer-mediated communication. This leads to the difference in identifying factors affecting user satisfaction of AIS from that of general IS. In addition, the context of Vietnam should be considered in this research due to several reasons. First, the approach that views AIS as an IS is relatively new in Vietnam. Second, most of firms often only used cheap, simple accounting software packages. Third, the quality of accounting staff in Vietnam is highly diversified, especially their information technology technical capability. This is due to the fact that the mid-aged or elder staff are slower in grasping the changes in applying information technology for accounting jobs than the younger, more technical savvy staff. As a result, the model for AIS user satisfaction in Vietnam should bear some distinct characteristics from those suggested in the extant literature.

The hypotheses for the theoretical model of factors influencing AIS user satisfaction are as follows.

First, the most important function of IS in general and AIS in particular is to provide information, thus quality of accounting information is the first factor affecting AIS user satisfaction. As a result, information quality is the first factor included in the model.

H1. Accounting information quality (IQ) positively impacts on AIS user satisfaction (US).

Second, accounting information is the output of information management process, where technical aspects of the system impact information creation. Therefore, system quality is a factor influencing user satisfaction because users often perceive that high quality information can only be provided by a high quality IS.

H2. Quality of accounting information processing system (SQ) positively impacts AIS user satisfaction (US).

Third, human factor is another fundamental component of an AIS since AIS is a combination of human and equipment resources designed to convert financial data and other data to information (Bodnar & Hopwood, 2013). Therefore, humans, in the case of AIS, are accounting staff, play a very important role in shaping the quality of an AIS. While there have been limited studies on accounting staff quality's impact on AIS user satisfaction, this is particularly relevant in the context of Vietnam, a developing country.

The reason is that there are still gaps in the qualification of accounting staff among firms in Vietnam. Large, established firms can afford well trained and experienced accounting staff, while small, start-up firms often make do with recent graduates who have limited experience. As a consequence, the author includes accounting staff quality in our model as an exploratory factor.

H3. Quality of accounting staff (QA) positively impacts on AIS user satisfaction (US).

Finally, the level of satisfaction is a correlation between perceived results (*real benefits*) and user expectation. It is also determined by user perception of the usefulness and efficiency brought by AIS. Petter *et al.* (2008) summarize research result during 1992-2007 and note that, in 11/11 of them, factors related to users' perception, desire and expectation of IS strongly influence their satisfaction on the system.

H4. The user's perception of AIS usefulness (PU) positively impacts on AIS user satisfaction (US).

It is worth noting that, previous studies also indicate that service quality can also affect IS user satisfaction. However, Choe's study in Korean firms (1996) pointed out that IS personnel experience slightly affected user satisfaction at the early stage of system operation. However, when the system was well-operated, there was no relationship between the AIS support personnel and user satisfaction.

In Vietnam, most firms use packaged accounting software. Once the firm has familiarized with using the software, the vendor would not be responsible for providing any additional service to the firm. As a result, the quality of service provided by the vendor becomes irrelevant in measuring user satisfaction of AIS. Thus, in difference to previous studies, this study assumes that there is the relationship between the quality of the service provided by the vendor and user satisfaction of AIS is insignificant.

About system use, while Halawi *et al.* (2007) figured out a relationship between user satisfaction and system use, Seddon & Kiew (1996) believed that in a mandatory context, system use did not affect user satisfaction. In the case of AIS, AIS is a compulsory system and is used in a frequent manner. Therefore, it is safe to assume that the factor of "Use" may have little effect on AIS user satisfaction.

In addition, apart from affecting AIS user satisfaction, the four factor groups of information quality, system quality, staff quality, and perceived usefulness also influence each other. Huynh and Nguyen (2013) show that for public hospitals in Vietnam, the output information is more accurate and relevant if the AIS has better speed, is more flexible, is more reliable, and has better security. Notably, the authors point out that when managers have higher perception of AIS usefulness, the system is more likely to be invested in and/or upgraded. Considering the similarity between the context (Vietnam) and model of Huynh and Nguyen (2013) and our research, the author follows the study and include the impact of system quality on information quality and of perception of usefulness on system quality in our model.

Besides, humans have crucial effect on information

quality. Nguy & Pham (2013) represents human factor with the quality of staff and suggests that the higher the quality of staff, who better collect and process information, the higher the information quality is.

Therefore, this study suggests 3 more hypotheses:

H5. *Quality of accounting information processing system (SQ) positively impacts accounting information quality (IQ).*

H6. *The user's perception of AIS usefulness (PU) positively impacts quality of accounting information processing system (SQ).*

H7. *Quality of accountant staff (QA) positively impacts accounting information quality (IQ).*

In order to further confirm the relationships among these factors mentioned above, the author interviewed 30 CFOs and Chief Accountant of selected firms in Danang city, Vietnam.

Table 1. A survey on factors affecting AIS user satisfaction

Relationships	Results					
	Fre-quency		%		Mean	Std. deviation
	Y	N	Y	N		
Information Quality ->User Satisfaction	28	2	93	7	5,53	0,991
System Quality ->User Satisfaction	27	3	90	10	5,20	1,013
Service Quality ->User Satisfaction	11	19	37	63	3,57	1,055
System Use ->User Satisfaction	8	22	27	73	3,33	1,075
Perceived Usefulness ->User Satisfaction	26	4	87	13	5,20	1,077
Staff Quality ->User Satisfaction	21	9	70	30	4,27	1,062
System Quality ->Information Quality	25	5	83	17	5,03	1,080
Perceived Usefulness ->System Quality	18	12	60	40	4,47	1,024
Staff Quality ->Information Quality	21	9	70	30	4,53	1,087

relationships between system quality and information quality, user's perception and system quality and quality of accountant staff and information quality.

Thus, the theoretical model of factors affecting AIS user satisfaction is proposed as shown in Figure 1.

4.2. Measuring the constructs of the model

Five constructs used in this research are: information quality, system quality, quality of accounting staff, perceived usefulness, and user satisfaction. The author identifies observed indicators based on those used in previous studies and also suggest additional indicators that are relevant for the case of AIS and the special characteristics of Vietnamese firms.

Information Quality

The main function of AIS is to inform and monitor the creation and flows of assets. Therefore, apart from the criteria measuring information quality in general, there are specific requirements and characteristics for accounting information quality. According to the Financial Accounting Standards Board (FASB), accounting information quality can be divided into two groups: (1) the basic group includes relevance and reliability; (2) the secondary group is consisted of consistency and comparability. The features of financial statement information quality is defined by the FASB include: (1) understandability, (2) relevance, (3) reliability, and (4) comparability.

Information quality presented in the “basic requirements for accounting” part in the Vietnamese Accounting Standards No 1 includes: honesty, objectivity, fullness, timeliness, understandability and comparability.

Table 2. Information quality measurement

Items	Supporting literature
Relevance	Ives <i>et al.</i> (1983), DeLone & McLean (2003), Halawi <i>et al.</i> (2007), Petter <i>et al.</i> (2008), FASB, IASB.
Accuracy	Ives <i>et al.</i> (1983), Doll and Torkzadeh (1988), DeLone & McLean (1992), Wixom and Todd (2005), Chiu <i>et al.</i> (2007), Halawi <i>et al.</i> (2007),
Reliability	Ives <i>et al.</i> (1983), DeLone & McLean (1992), Halawi <i>et al.</i> (2007), Cobit standard, IASB, VAS.
Fullness	Ives <i>et al.</i> (1983), DeLone and McLean (1992, 2003), Wixom and Todd (2005), Chiu <i>et al.</i> (2007), Halawi <i>et al.</i> (2007), Petter <i>et al.</i> (2008), Cobit standard, VAS.
Understandability	DeLone & McLean (2003), Chiu <i>et al.</i> (2007), Halawi <i>et al.</i> (2007), IASB, VAS.
Timeliness	Ives <i>et al.</i> (1983), DeLone & McLean (1992), Halawi <i>et al.</i> (2007), Petter <i>et al.</i> (2008), VAS.
Comparability	Leclercq (2007), DeLone and McLean (1992), FASB, IASB, VAS

System Quality

System quality is widely measured by 4 indicators: speed, reliability, flexibility and integration. The author adds the “security” indicator as a result from the fact that

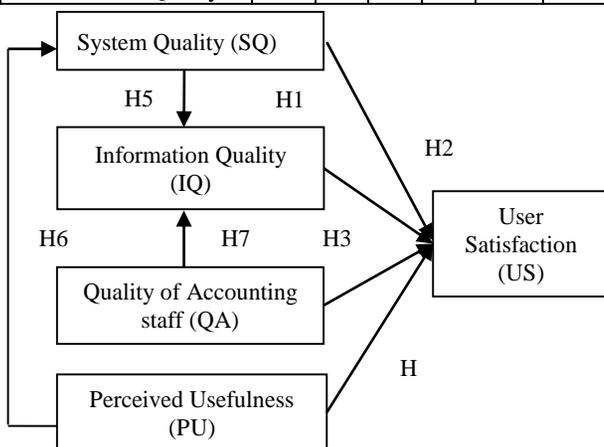


Figure 1. Suggested model on AIS user satisfaction

The results (Table 1) show that these experts suggest Information quality, System quality, Perceived usefulness and Staff quality have a direct impact on user satisfaction. The interview results also cement the author's suggested

there is higher risk of data/information which is exploited, hacked, copied, stolen and wrongfully used.

Table 3. System quality measurement

Items	Supporting literature
Speed	DeLone & McLean (2003), Chiu <i>et al.</i> (2007), Halawi <i>et al.</i> (2007), Petter <i>et al.</i> (2008).
Reliability	DeLone & McLean (2003), Wixom & Todd (2005), Chiu <i>et al.</i> (2007), Petter <i>et al.</i> (2008).
Flexibility	Ives <i>et al.</i> (1983), DeLone & McLean (1992), Wixom and Todd (2005), Halawi <i>et al.</i> (2007), Leclercq (2007), Petter <i>et al.</i> (2008).
Integration	DeLone & McLean (1992), Wixom and Todd (2005), Halawi <i>et al.</i> (2007).
Security	New indicator

Staff Quality

Accounting staff quality is a new construct in our model. Suggested measure of accounting staff quality has four observed indicators, namely accounting qualification, training, IT qualification and experience. Among them, “experience” can be an exploratory indicator of accounting staff quality.

Table 4. Staff quality measurement

Items	Supporting literature
Qualification	Nguy Thi Hien, Pham Quoc Trung (2013), Zhang <i>et al.</i> (2005)
Training	Nguy Thi Hien, Pham Quoc Trung (2013), Zhang <i>et al.</i> (2005)
Level of IT	Zhang <i>et al.</i> (2005)
Work experience	New indicator

Perceived Usefulness

The measure of user perceived usefulness of AIS is suggested to consist of 4 observed indicators.

Table 5. Perceived usefulness measurement

Items	Supporting literature
Support job	Davis (1989), Torkzadeh & Doll (1999), Brynjolfsson <i>et al.</i> (2002)
Connect operations	Davis (1989), Seddon & Kiew (1994)
Increase efficiency	Davis (1989), DeLone & McLean (1992), Seddon & Kiew (1994)
Factor of success	Davis (1989), DeLone & McLean (1992), Seddon & Kiew (1994)

User Satisfaction

Based on the extant literature, the author suggests 3 observed indicators for user satisfaction.

Table 6. User satisfaction measurement

Items	Supporting literature
Execute the function well	Torkzadeh & Doll (1999)
Meet expectations	Torkzadeh & Doll (1999), Baroudi, Olson, Ives (1986); Seddon & Kiew (1994); DeLone & McLean (1992)
Satisfy about AIS	Seddon & Yip (1992)

In summary, the observed indicators in the theoretical model proposed by this study are largely derived from the

extant literature, with the some modifications to better reflect the practical case of AIS use in Vietnam.

5. Conclusion

This study adds to the literature by proposing a theoretical model of factors affecting user satisfaction of AIS in the context of Vietnam. The four factors affecting AIS user satisfaction included in the model are Information quality, System quality, Quality of accounting staff, and Perceived usefulness. Among the factors, System quality and Quality of accounting staff are hypothesized to affect Information quality, while Perceived usefulness is to impact System quality. These features are expected to better fit the model to the case of AIS in Vietnam than the extant models for general IS. First, Quality of accounting staff is included as an exploratory factor. Second, se and Quality of service are excluded. Also, the observed indicators are carefully constructed to be relevant.

As far as the author knows, this is the first study to attempt to investigate AIS user satisfaction in Vietnam. Because this study is basically theoretical, the author looks forward to future empirical research that would confirm the hypotheses suggested in the model. As the view has been changing to be more accounting-focus for AIS in Vietnam, factors influencing user satisfaction, which is a measure of the value of the system, need to be carefully examined. Theoretically and empirically investigating the factors’ relationship with each other and with the AIS user satisfaction would help managers decide how to best improve their AIS.

This research is funded by Funds for Science and Technology Development of the University of Danang under grant number: B2016-DNA-13-TT.

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(The Board of Editors received the paper on 03/10/2018, its review was completed on 22/10/2018)