Impact of Accountant Resource on Quality of Accounting Information System: Evidence from Vietnamese Small and Medium Enterprises

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ARTICLE INFO

ABSTRACT

Improving the quality of accounting information systems through accountant resources is beneficial to the performance and sustainable development of SMEs. This study investigated the impact of accountant resources on the quality of accounting information systems in Vietnamese SMEs. Accounting information system quality was measured by a multidimensional scale including system quality, information quality, and usefulness. The study tested hypotheses using Path analysis of Structural Equation Model based on 434 respondents. The findings indicated a strong interaction between the components of the accounting information system quality under the effect of accountant resources. The results showed a positive direct effect of accountant resources on system quality and the path analysis results also revealed an influence of accountant resources on information quality and usefulness via mediating variables. The results highlighted the importance of accountant resources for the quality of accounting information systems. This study contributed theoretically to the non-financial indicator for measuring accounting information system quality.

Introduction

Small and medium enterprises (SMEs) are the center in the economies of several countries that contribute a significant rate of gross domestic product. SMEs account for a large proportion of total number enterprises in economic systems around the world, for example, from 96% to 99% of all companies in OECD nations (Scupola, 2009) or up to over 98% in Vietnam (MPI, 2017; VCCI, 2017). Comparing to large companies, SMEs have many advantages such as adaptable, more capable of creativity and resilience faster in a competitive environment (Salavou, 2004), effectively connected information systems in a globalization trend period (Gunasekaran, Rai, & Griffin, 2011). In contrast to the advantages, SMEs also face off various issues such as lack of resources (Delone, 1988), difficulties to receive funding and the trouble of transparency and information asymmetry (Ghorbel, 2017). In Vietnam, SMEs are vulnerable to economic fluctuations, so the negative impacts of the business environment lead many businesses to make losses and withdraw from the market in Vietnam (MPI, 2017). In general, Vietnamese SMEs are important economic components as well as a vital contributor to employment and innovation creation, but they get a lot of barriers to their growth and innovation.

The accounting information system is a driver for the development of SMEs. An accounting information system is a subsystem of the management information system (MIS) that plays crucial roles in formulating and calculate organizational strategy to reinforce financial control (Chenhall, 2003). The accounting information system brings paramount information for stakeholders to make effective decisions also to assure the organizational competitiveness

(Saganuwan, Ismail, & Ahmad, 2013), affect business strategy implementation (Uyar, 2019) and provide information for corporate sustainability (Perrini & Tencati, 2006). Moreover, it is useful for decrease fraud and errors (Ngo, Le, & Nguyen, 2013) and improves the efficiency of the integration process to economic agreements in Vietnamese SMEs (Phan & Pham, 2015). However, Vietnamese SMEs are not equipped with adequate accounting information systems when their information sophistication mainly focuses on accounting applications for bookkeeping functions than planning and controlling functions (Binh, 2017). Additionally, a low rate of SMEs applies decision support systems, computer-aided manufacturing and computer-assisted production management in their technological sophistication (Binh, 2017). Because of its importance, the accounting information system has become progressively concerned in management in general and in management control research in recent years (Merchant & Van der Stede, 2011).

Implementing an accounting information system provides managers with a meaningful tool to govern activities and to curb business disadvantages. Quality is a non-financial indicator of performance measurement (Neely, Gregory, & Platts, 1995). So a huge number of researchers carry out to evaluate the quality of accounting information systems also factors influencing accounting information system quality. Assessing accounting information system quality is a topic of great interest and accounting information system quality measures are diverse. Some preceding studies have used one dimension to measure the quality of accounting information systems. For example, the studies of Dehghanzade, Moradi, and Raghibi (2011) and Oakes (2006) have employed accounting information quality as a measure while others, such as Boulianne (2007) and Sajady, Dastgir, and Nejad (2008), adopted organizational performance measure. However, recent studies have shown a significant tendency to use the multidimensional scale by a combination of constructs because accounting information system effectiveness does not have a single measure to explain (Delone & McLean, 2003). Chalu (2012) has extended to Delone and McLean's opinion and suggested that measurements of accounting information effectiveness need to illustrate "output-orientation, systems-orientation, and user-orientation and organizational orientation". Multi-dimension measures are better by fully illustrating aspects of measuring accounting information system quality. Multidimensional measurement has been used by researchers for information systems such as MIS, e-commerce systems, e-learning systems. In Vietnam, the study of Huynh and Nguyen (2013) has proposed a combination scale to measure the quality of accounting information systems but lack of empirical evidence for this measure.

Accountants are an indispensable component in an accounting information system that impacts on quality of accounting information systems. Accountants not only carry out accounting information system functions but also are end-users of the system (Hall, 2011). In SMEs, accountants play both the role of a consultant in accounting services and the role of business advisers (Gooderham, Tobiassen, Døving, & Nordhaug, 2004). Accountants have an impact on the quality of accounting information systems, for example, the qualifications of accounting staff have a great influence on the quality of accounting information systems (Chalu, 2012). Or the individual characteristics of an accountant is an efficient factor of computer-based accounting information system effectiveness (Dehghanzade et al., 2011). However, there is a lack of evidence from Vietnam, especially in the SME context, relating to the impact of accountants on the quality of accounting information systems.

As noted above, the topic of accounting information systems has been increasingly concerned about measuring and evaluating the impact of factors in SMEs in Vietnam. But there is a gap in measuring the quality of accounting information systems and evaluating the impact of accountant resources on the quality of accounting information systems. Aim to fill these gaps, this study has two objectives. The first objective of this research is to investigate an interaction among three constructs including system quality, information quality, and usefulness that represent the quality of accounting information systems under the influence of accountant resources. The second objective is to explain how much accountant resources impact on the quality of accounting information systems in the context of Vietnamese SMEs.

This study makes several contributions. Our research provides a comprehensive examination of the quality of accounting information systems, measured by multidimensional constructs including system quality, information quality, and usefulness. We highlight that accounting information system quality components are separate but strongly interdependent, in which system quality has the greatest influence on usefulness and information quality. Our results provide evidence for a significant direct effect of accountant resources on system quality but reject its direct influence on information quality as well. However, our research proves an indirect linkage between accountant resources and the other two components of the accounting information system quality.

Literature review

Quality of accounting information systems

Accounting information system is an essential subsystem in the management information system (Allahverdi, 2011), which offers some functions including collecting, analysing, categorizing, and reporting with key purpose is to convert input data into useful information (Boockholdt, 1995). With plentiful data sources, timely processing, and rapid transmission, the accounting information system is beneficial for enterprises (Shen & Han, 2019). In recent years, accounting information system research has become progressively concerned in both general management and management control research (Merchant & Van der Stede, 2011). AICPA (1966) stated "accounting is information system" while American Accounting Association defined that accounting information system is a system that "gathers, classified, and compiles data to offer to internal and external decision-makers". In SMEs, accounting information system is an organized structure of mandatory subsystem to generate accounting information which supports managers to run their company (Chapellier, Mohammed, & Teller, 2013) and helps firms develop business cooperation and share knowledge (Levy, Loebbecke, & Powell, 2003). Accounting information systems have an important role which is a mechanism to enlarge organization financial control through formulating and calculating firm strategy (Chenhall, 2003). It is a tool of firms that producing information for managing functions, such as planning, controlling and decision-making (Saganuwan et al., 2013).

According to Meiryani (2015), the quality of accounting information system is "an integrated system of accounting information from the various components of accounting information systems are interconnected and work together in harmony to process financial data into useful accounting information for users" (page 82). Nicolaou (2000) also mentioned the term accounting information system integration to define the effectiveness of the accounting information system. In this study, the quality of accounting information systems is defined as an integrated system of different components to take over accounting functions such as collecting, classifying, analysing, and communicating data into useful information for stakeholders.

IS success model in the context of accounting information system

To answer the question about measuring dependent variables of information system (IS) field, Delone and McLean (1992) proposed a dependent variable called IS success and recapitulated six interrelationship variables representing IS success. Six variables of the primary IS success model includes: system quality, information quality, use, user satisfaction, individual impact and organizational impact that were separate but interdependent. The authors called for more studies to confirm their model. Pitt, Watson, and Kavan (1995) suggested an additional construct, service quality, into the IS success model. While Seddon (1997) excluded Pitt et al. (1995) interpretation because service quality is to measure the quality of the IS department not "application of information technology", Delone and McLean (2003) added service quality to the upgraded IS success model. Another discussion from Seddon and Kiew (1996) that *use* would be suitable for voluntary systems, with mandatory systems such as accounting information systems, *usefulness* would be better. The *usefulness* construct that Seddon and Kiew (1996) mentioned was commonly used in Technology Acceptance Model (TAM) by Davis (1989). Although Delone and McLean (2003) didn't upgrade usefulness in their model, a lot of researchers still picked up *usefulness* construct in the context of mandatory systems. The updated IS success model of Delone and McLean (2003) had some modifications with six components comprise system quality, information quality, service quality, use, user satisfaction, and net benefit. However, Delone and McLean (2002) stated that system quality and information quality are the best measures if only a single system is considered, but the service quality is an important variable in the model when evaluating the success of the IS department.

The measures of the quality of accounting information systems are very diverse and can be used individually or in combination. Petter, Delone, and McLean (2008) argued that the selection of constructs depends on the context such as the nature of the firm, the purpose of the system. So in this study, *system quality* and *information quality* are picked up because they are the best measures for every information system (Delone & McLean, 2002). Also, in the context of the accounting information system, a mandatory system, *usefulness* is a suitable measure to evaluate the quality of accounting information systems (Seddon & Kiew, 1996). Meanwhile, *service quality* is used better for assessing the information technology department than the application of information technology (Seddon & Kiew, 1996), so, this measure is less appropriate with the context of Vietnamese SMEs. Moreover, user satisfaction is not to include in this model because lots of items of user satisfaction measurements already mapped and included in

system quality and information quality (Gorla, Somers, & Wong, 2010). Therefore, three components include *system quality, information quality* and *usefulness* are proxies for accounting information system quality. These constructs are separate but interdependent, and their relationships are temporal, not causal influences (Seddon, 1997).

Accountant resource

In the organization, accountant resource is the human capital which is knowledge, skills, and abilities to provide professional services (Sagara, 2015). Accountant resource is an element of accounting information system (Allahverdi, 2011; Romney & Steinbart, 2015) that related to data input and producing the output of accounting information system (Al-hiyari, Al-Mashregy, Mat, & Alekam, 2013). For the detail, accountant resource is those who directly conduct accounting functions such as collecting, processing data, analysing, and communicating information (Hall, 2011). Evidence from recent research has recognized an important role of accountant resources in accounting information system success. Accountants play roles as a user, designer, and controller of the accounting information system (Hall, 2011) that means accountant resource have responsibilities for sharing with the information technology specialist to develop applications in the accounting information system. Accountants participate in every stage of accounting information system cycle from planning, analysing, designing, implementing, and assessing the accounting information system performance that leads to minimize system-related risks and make the system more appropriate (Okab & Al-Oqool, 2014) and make accounting information more relevant (Al-hiyari et al., 2013). Especially in SMEs, the accountant resource also plays an advisory role for the executive board in decisions about internal planning, business decision-making, or controlling (Gooderham et al., 2004). Therefore, the development cycle of an accounting information system that ignores the accountant resource role will lead to ineffective or even failed systems (Meiryani, 2014).

Research mode and hypotheses

The conceptual model of this study is showed in Figure 1, in which the quality of accounting information systems is a multi-dimension measure. *System quality, information quality*, and *usefulness* focus on user perception with information generating from the accounting information system. Three constructs of accounting information system quality are separate but interrelationship.

 Seddon and Kiew (1996) debated that in mandatory systems such as the accounting information system, the transmission of useful information for a certain time is one of the most regular measures of success system. So usefulness is a good measurement, replaced for the *use* in the context of mandatory system (Seddon & Kiew, 1996). The usefulness of accounting information systems is the degree to which one believes that the use of accounting information system will improve their job performance (Davis, 1989). Usefulness measure consists of improving job performance, improving productivity, enhancing job effectiveness and useful in work (Liao, Chen, & Yen, 2007). An accounting information system is useful if it creates benefits for the organization and the benefits of use are much greater important than costs.
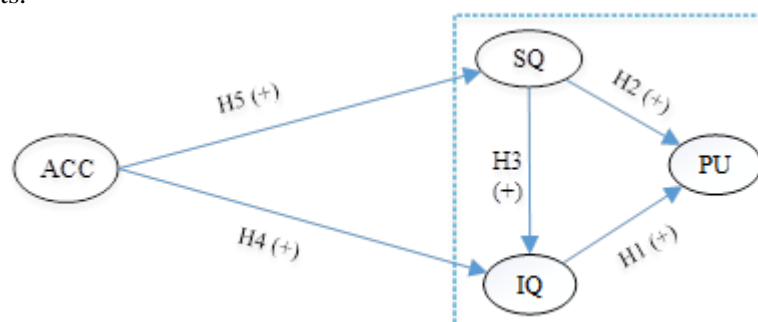

Figure 1. The conceptual model

 Information quality attributes to the outputs of the accounting information system that is concerned with the characteristics of information. Delone and McLean (1992) suggested that information quality should measure the quality of information system output which is generated from an accounting information system and performed in accounting reports. Information quality refers to the characteristics as accurate, relevant, and timely information generated from accounting information systems (Seddon, 1997). Gorla et al. (2010) in a study relating IT investment in accounting information systems refers to information quality in the form of the online screen and printed reports.

So information quality related to both information content and information format. Information content includes the characteristics of accuracy, completeness, conciseness, usefulness for the daily job, relevance for decision making while information formats are good appearance and format, comparable to other outputs, easily to understand (Gorla et al., 2010). Kraemer, Danziger, Dunkle, and King (1993) debated that better information quality will result in higher usefulness. Empirical evidence of Seddon and Kiew (1996) by using OLS regression and path analysis supported that increasing information quality causes a rise in usefulness. we hypothesize that

H1: Improving information quality will result in increasing usefulness in accounting information systems.

System quality is one of the most important indicators of IS success that interprets measures of the information producing system itself (Delone & McLean, 1992). System quality is related to whether or not "error" in the system, user interface consistency, ease of use, document quality and the quality and maintainability of the coding program (Seddon, 1997). System quality measures declare user perceptions of reciprocal action with accounting information system over time (Nelson, Todd, & Wixom, 2005) that include easy to learn, equipped only with useful features and functions, flexible to make changes, well-integrated, user-friendly, good documentation, short response time for on-line inquiry, and short time lag between data input and output for batch processing (Gorla et al., 2010). Organizations improving system quality can trigger a rise in information system usefulness (Sabherwal, Jeyaraj, & Chowa, 2006; Seddon & Kiew, 1996). Higher system quality is as easier to use, thus, it has higher levels of usefulness (Davis, 1989). Furthermore, an inadequate system most probably causes low system output that puts firms into a less competitive advantage position (Gorla et al., 2010). In other words, there is a linkage between information quality and system quality (Fitriati & Susanto, 2017; Gorla et al., 2010; Susanto, 2017). Therefore, we propose hypotheses:

H2: System quality is expected to facilitate usefulness.

H3: Enhancement in system quality will lead to enlargement in information quality.

Accountant resource is the significant driver who improving quality of accounting information system in SMEs because of the role of business advisers (Gooderham et al., 2004). Accountant resource measures include the long-term relationship of accountants with the firm, competence in statutory accountancy services, competence in business advisory services (Gooderham et al., 2004). Several studies strengthened the influence of accountants on the quality of accounting information systems (Binh & Luan, 2017; Chalu, 2012; Iskanda, 2015; Ismail, 2009; Taber, Alaryan, & Haija, 2014). Accountants as end-users who perform their needs about accounting information system to designer relating specified accounting rules, algorithms in the system like the depreciation model. The quality of accounting personals affects the characteristics of accounting information (Zhou, 2010). Hence, Chalu (2012) addressed the impact of qualification of accounting staff on system quality and information quality. The above discussion leads to the following hypotheses:

H4: Accountant resource is positively associated with information quality.

H5: Accountant resource is positively associated with system quality.

Methodology

The research method illustrates measurement for the constructs of accounting information system quality and accountant resources as well as collecting data procedures. Then the study validates the instruments based on confirmatory factor analysis and tests hypotheses using path analysis in the structural equation model (SEM).

Measurement and instrument validation

Our questionnaire comprises two-part: the first part collects demographic of respondents, the second part measures variables related to 5 hypotheses. This research used perceptual measures. To avoid common method variance phenomena by using perceptual measure in both independent variable and dependent variable, we applied a technique Chang, Van Witteloostuijn, and Eden (2010) suggested in their article. By adopting diverse measures from different studies as well as utilizing various scales, we expected to decrease common method variance phenomena. All construct measurements were selected from prior studies. Specifically, we picked up two constructs system quality and information quality, from Gorla et al. (2010), usefulness construct from Liao et al. (2007), and accountant resource was picked up from Gooderham et al. (2004). The research use 7-point Likert scale with usefulness, system quality, and information quality and 5-point Likert scale with accountant resource.

English is not a native language nor used frequently in daily communications in Vietnam while all questionnaire items used in this study are sourced from English questionnaires. From our experience in previous business surveys, we found that it is very difficult to collect data so it is necessary to carefully design the questionnaire to avoid re-

conducting the survey. We implemented a pretest and pilot test to examine the psychometric properties of construct items. After translating construct items into Vietnamese, we did a pretest by interviewing a professional who majored in accounting and used English fluently to translate the questionnaire parallel. And then, we continued pretesting with 5 people including one manager, two chief accountants, and two accounting staff to ensure the articulation as well as comprehensiveness in the questionnaire. From the pretest result, we continued to correct the questionnaire. Finally, we did a pilot test with 50 respondents to test data entry and procedures of data processing.

Sample framework

In Vietnam, there are several criteria to classify SME such as total equity, labor, or revenue (Government, 2018) and total equity is applied in this study. The sample framework consists of SMEs operating in Hanoi, is capital as well as is concentrated the second largest number of businesses in Vietnam (VCCI, 2017). There is approximately 232,000 SMEs account for above 97% of the total number of enterprises in Hanoi (Quang Phu, 2018). This research concerns SMEs running more than one year due to firms need time to implement their system and to communicate financial statements, thus, this condition makes it easy for the respondent to select their company's total equity on the questionnaire.

Data Collection

Data collections applied convenience sampling and data is gathered by using a closed questionnaire via email registered with tax authorities and Facebook Messenger. This research chose an online survey because of the popularity of the internet used in academic papers (Bhattacherjee, 2001). The online survey link was sent to the firm's email list of three tax authorities. Besides, we messaged to members in "Gia đình kế toán" (Accountant Family) – a big public Facebook group with more than 241.000 members. In a total of 642 responses, 434 respondents were working in SMEs located in Hanoi. This sample size suitable for SEM analysis (Hair, Black, Babin, & Anderson, 2014).

Table 1 showed the demographics of respondents. The sample demographics are grouped into individual and organizational characteristics. Regarding individual characteristics, 38% is accounting staff, followed by a general accountant (25%), CEO (17%), chief accountant/CFO (17%), and head of the department (3%). The distribution of qualification includes 87% bachelor's degree and 13% master or higher education. 47% of respondents have under 3 years of working experience and a declining rate by years of working experience. Regarding organizational characteristics, a high rate of respondents works in commerce and service field (68%) while the remaining (32%) worked in other fields (agriculture; industry and construction). 52% of businesses ownership characteristic is the joint-stock company, followed by the limited liability company, private business, and partnership (36% and 12% respectively). Referring to the age of the firm, most firms have the age of 1 - 3 years (52%) and above 5 years (37%).

Table 1. Demographic of respondents

Individual characteristics	No.	%	Organizational characteristics	No.	%
Position			**Business field**		
Accounting staff	164	38%	Agriculture	13	3%
General accountant	109	25%	Industry and construction	125	29%
Chief Accountant/CFO	74	17%	Commerce and service	296	68%
Head of the department	15	3%	**Ownership**		
CEO	72	17%	Private business, partnership	52	12%
Qualification			Limited liability company	158	36%
Bachelor	393	91%	Joint Stock Company	224	52%
Master and higher education	41	9%	**Age of firm**		
Working experience			From 1 to 3 years	224	52%
Under 3 years	206	47%	From 3 to 5 years	49	11%

Individual characteristics	No.	%	Organizational characteristics	No.	%
From 3 to 5 years	104	24%	Above 5 years	161	37%
From 5 to 10 years	67	15%			
Above 10 years	57	13%			
Total	**434**	**100%**	**Total**	**434**	**100%**

Results

The measurement model is validated through reliability, convergent values and discriminant values by the confirmatory factor analysis (CFA). Structural equation modeling (SEM) using Maximum Likelihood estimation is used to test theoretical models and research hypotheses (5 hypotheses). The conceptual model (Figure 1) is described by the visual tools provided by AMOS. Heywood phenomenon does not appear during the estimation of the CFA and SEM model, so it can be concluded that this model is suitable for market data.

Confirmatory factor analysis results

The measurement model has four constructs including system quality (SQ), information quality (IQ), usefulness (PU), accountant resource (ACC). Firstly, CFA analysis results show that the multiple fit indices complied with the rule of thumb. The correlations between concepts are satisfactory and the results of the concept measurement have reached divergence validity and convergence validity. Indeed, CFA analysis results included chi-square normalized by degrees of freedom (Chi-square/df) being $3.646 < 5$ (Bentler, 2006), adjusted goodness of - fit index (AGFI) being $0.865 > 0.8$, goodness-of-fit index (GFI) being $0.903 > 0.9$, comparative fit index (CFI) being $0.953 > 0.9$, Tucker-Lewis Index (TLI) $= 0.941 > 0.9$, root mean square error of approximation (RMSEA) $= 0.078 < 0.08$, and standardized root mean square residual (SRMR) $= 0.037 < 0.08$ that indicate a good fit with conceptual model (Gunzler & Morris, 2015; Henry & Stone, 1994; Pham, Lai, & Vuong, 2019). Table 2 shows the details of multiple fit indices

Table 2. Results of multiple fit indices

Index	Result	Acceptable level
Chi-square	448.422	-
Degree of freedom (df)	123	-
Chi-square/df	3.646	< 5
CFI	0.953	> 0.9
GFI	0.903	> 0.9
AGFI	0.865	> 0.8
TLI	0.941	> 0.9
RMSEA	0.078	< 0.08
SRMR	0.037	< 0.08

Secondly, all constructs showed acceptable convergent validity by testing factor loadings, composite reliability (CR) and average variance extracted (AVE). As shown in Table 3, all factor loadings were greater than 0.55 with a P-value below 0.001 indicating a strong relationship with the construct (Hair et al., 2014). All construct reliabilities ranged from 0.868 to 0.95 and AVEs range from 0.616 to 0.827, which were higher than acceptable thresholds, 0.7 and 0.5, respectively. Finally, to test discriminant validity, this study used chi-square difference tests to compare with AVE scores. The results in Table 4 illustrated discriminant validity for all constructs.

Table 3. Results of factor loading for CFA

Items	Factor Loading	P-value
Accountant Resource (Gooderham et al., 2004)	**(Likert 5-point scale)**	
ACC1: Long-term relationship with the firm	0.766	***
ACC2: Perceived competence in statutory accountancy services	0.860	***
ACC3: Perceived competence in business advisory services	0.856	***
System Quality (Gorla et al., 2010)	**(Likert 7-point scale)**	
Our information systems are:		
SQ1: Easy to learn	0.702	***
SQ2: Equipped only with useful features and functions	0.677	***
SQ3: Flexible to make changes easily	0.761	***
SQ4: Applied modern technology	0.808	***
SQ5: Well integrated	0.796	***
SQ6: User-friendly	0.887	***
SQ7: Good documentation	0.823	***
SQ8: Short response time for on-line inquiry	0.802	***
Information Quality (Gorla et al., 2010)	**(Likert 7-point scale)**	
Our information outputs (including on-screen and printed outputs) are:		
IQ1: Accurate	0.897	***
IQ2: Complete	0.957	***
IQ3: Concise	0.845	***
Usefulness (Liao et al., 2007)	**(Likert 7-point scale)**	
PU1: Using AIS improves my performance in working	0.915	***
PU2: Using AIS improves my productivity in working	0.935	***
PU3: Using AIS enhances my effectiveness in working	0.895	***
PU4: I find AIS to be useful in my job	0.891	***

*** $P < 0.001$

Construct	CR	AVE	Factor correlation			
			ACC	SQ	IQ	PU
ACC	0.868	0.687	1			
SQ	0.927	0.616	0.432	1		
IQ	0.928	0.827	0.348	0.063	1	
PU	0.950	0.812	0.419	0.657	0.622	1

Structural equation model results

SEM from path analysis is summarized in Figure 2 and Table 5, in which the goodness of fit, the explained variance of endogenous variables and path coefficients are illustrated. The statistical values Chi-square/df is 3.694, being in a range of acceptable levels of less than 5 (Bentler, 2006). Other indicators also demonstrated a adequate fit (GFI = 0.901, AGFI = 0.864, CFI = 0.951, TLI = 0.94, RMSEA = 0.079, SRMR = 0.042) (Gunzler & Morris, 2015; Pham et al., 2019).
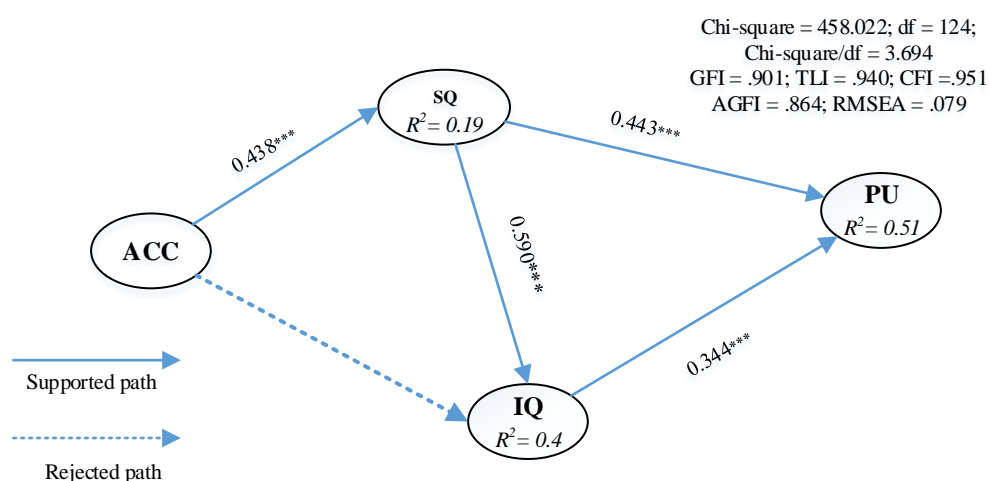
Figure 2. Standardized results of structural equation model

According to standardized estimation results in Table 5, four hypotheses in this study were supported by our empirical analysis of SEM (p<= 0.001), excepting the impact of accountant resource on information quality (H4: p = 0.051). Accountant resource has positive influence on system quality (H5: p = 0.001), system quality has positive effects on information quality (H3: p = 0.001), system quality has positive effect on usefulness (H2: p = 0.001) and information quality has positive impact on usefulness (H1: p = 0.001). Therefore, except for the hypothesis H4, all other hypotheses were accepted. Besides, the result in Figure 2 illustrated that system quality is predicted by accountant resource, which explained 19% of the variance in system quality. Information quality was predicted by system quality with 40% of the variance in information quality. Usefulness was determined by system quality and information quality, which jointly explained 51% of the total variance explained.

Table 5. Standardized Regression Analysis and hypothesis results

	β coefficient	t value	Hypothesis
Dependent variable: System Quality			
Accountant Resource	0.438	8.282***	H5: Supported
R²: 19% of the variance of System Quality are explained by Accountant Resource			
Dependent variable: Information Quality			
Accountant Resource	0.094	1.951	H4: Rejected
System Quality	0.590	11.48***	H3: Supported
R²: 40% of the variance of Information Quality are explained by Accountant Resource and System Quality			
Dependent variable: Usefulness			
System Quality	0.443	8.423***	H2: Supported
Information Quality	0.344	6.839***	H1: Supported
R²: 51% of the variance of Usefulness are explained by System Quality and Information Quality			

- **Total effects of accountant resource, system quality and information quality on usefulness**

Usefulness is predicted by information quality, system quality calculated by direct and indirect impact through information quality, and indirect effect of accountant resource through two mediators including system quality and information quality. This result depicted that system quality contributed to the highest motivator of usefulness in the model, followed by information quality and accountant resource (Table 6).

Table 6. Total effects of accountant resource, system quality and information quality on usefulness

Antecedent	Direct effect route and magnitude	Indirect effect route and magnitude	Total effect
Accountant Resource	/	Accountant Resource - System Quality - Usefulness: 0.438 x 0.443	0.194
Accountant Resource	/	Accountant Resource - System Quality - Information Quality - Usefulness: 0.438 x 0.590 x 0.344	0.089
Accountant Resource (total)			**0.283**
System Quality	System Quality - Usefulness: 0.443	System Quality - Information Quality - Usefulness: 0.590 x 0.344	**0.646**
Information Quality	Information Quality - Usefulness: 0.344	/	**0.344**

- **Total effects of accountant resource and system quality on information quality**

As shown in Table 7, information quality was predicted by the direct effect of system quality and the indirect effect of accountant resources through mediator system quality.

Table 7. Total effects of accountant resource and system quality on information quality

Antecedent	Direct effect route and magnitude	Indirect effect route and magnitude	Total effect
Accountant Resource	/	Accountant Resource - System Quality - Information Quality: 0.443 x 0.590	0.258
System Quality	System Quality - Information Quality: 0.590	/	0.590

Discussion

In this study, we postulate a multidimensional measure to assess the quality of accounting information system including system quality, information quality, and usefulness. This research examines accountant resources using SEM to explore its impact on the quality of accounting information systems. The conceptual model is empirically approved using data collected from a field survey of Vietnamese SMEs located in Hanoi. The CFA results validate and refine the measurement model. In the context of Vietnamese SMEs, item "short time lag between data input and output for batch processing" is removed from the system quality construct. This reveals a simple processing procedure in the accounting information system due to employing the applications for mainly bookkeeping in the accounting information system (Binh, 2017). Three items of information quality are retained while five items removed. Gorla et al. (2010) discussed that "accurate, complete, and concise" reflect information content, meanwhile, eliminated items represent information format. That means information quality in Vietnamese SMEs only meets the requirements of accounting information in Vietnamese Accounting Standards but does not facilitate corporate governance.

While many prior studies used single scales to measure the quality of accounting information systems, our results confirm that the multidimensional scale is a necessity to comprehensively measure accounting information system quality. This research provides empirical evidence for Huynh and Nguyen's study (2013), they suggested use multi-criteria to measure accounting information system quality. The acceptance of hypotheses H1, H2, H3 indicates that three proxies of accounting information system quality are not separate, they interact strongly with each other. System quality is a key driver of information quality and usefulness. These results are similar to the study of Gorla et al. (2010) who argued that a system with old hardware and software causes poor outputs, and enhancements in system quality help increase information quality. Moreover, the same as previous results about the effect of system quality on usefulness (Davis, 1989; Sabherwal et al., 2006; Seddon & Kiew, 1996), this research states the higher system quality, the easier it is for users to feel useful of accounting information system. These empirical results show an increase in information quality causes a rise in usefulness that is consistent with the study of Seddon and Kiew (1996),.

This empirical study contributes to the main findings to the influence of accountant resources on the quality of accounting information systems. The SEM results showed that constructs in the conceptual model are appropriate. Comparing effect sizes and explained variance, we found that the interaction among accountant resources, system quality, and information quality explained 51% of the variance of usefulness. Another significant result, the interaction between accountant resource and system quality explained 40% of the variance of information quality. And accountant resource explained 19% of the variance of system quality. Explanation level of model, which is shown by R^2 values is consistent with previous studies in accounting information system quality, for example, Mokodompit and Wuriasih (2017) (R^2 = 50.3%), Ismail (2009) (R^2 = 41.1%) and Fitriati and Susanto (2017) (R^2 = 50%).

The test results accepted hypothesis H5 while rejecting hypothesis H4. The support of hypothesis H5 shows that accountant resource directly affects system quality. This finding agreed with Hall (2011) that accountants have an important role in coordinating with the information technology specialist to choose the most effective applications and suppliers. They are determinants of system quality. Accountants who are long-term relationships with firm and high competence will help firms minimize risks as well as facilitate accounting information systems. The rejection of hypothesis H4 is consistent with the study of Al-hiyari et al. (2013) but contrary to Chalu's (2012) study. The result can be explained that accountants only communicate accounting information following regulations but not satisfied information demands for corporate governance in Vietnamese SMEs. In other words, accountant resource does not have a key contribution to increasing information quality. This may be lead to accountant resource that has no direct impact on information quality. Although, there is no direct impact on information quality. Through mediator of system quality, accountant resource still has an indirect impact on improving information quality. This means that accountants with positive effects that increase system quality also improve information quality. For example, accountants who implement systems with modern applications, integrate well with other subsystems, set up good system documentation will help information in segment and enterprise reports more accurate, complete, and concise. Through two mediators system quality and information quality, accountant resource is a factor affecting usefulness. Long-term and capable accountants will help improve system quality and then heighten information quality, resulting in users perceiving more useful information. The results in this study confirm that accountant resource is a crucial factor in improving the quality of accounting information systems in Vietnamese SMEs. Accountants are an accounting and business services consultant for managers (Gooderham et al., 2004). The results implied for SMEs need to be continuously train accounting competence as well as increase a relationship with accountant resources. Training is an important solution that helps increase the performance of SMEs (Ipinnaiye, Dineen, & Lenihan, 2017), and due to the continuous change of accounting and business environment, training is a necessary solution. Meanwhile, the long-term accountant will better understand the system and business characteristics of the firm.

Conclusion

Research topic on accounting information system quality has gotten a lot of attention in the previous studies of Dehghanzade et al. (2011), Boulianne (2007), and Sajady et al. (2008). However, these studies used one dimension to measure the quality of accounting information systems. This paper investigated accounting information system quality, using a multidimensional scale by a combination of constructs, which differs from previous research. In the context of Vietnamese SMEs, we explored a strong interaction between three components of accounting information system quality. The results confirmed positive influence of accountant resources on system quality. The structural model analysis results showed that accountant resource was a factor affecting the quality of accounting information systems.

This research also had several academic and managerial implications. First, it provided an in-depth explanation of the performance of accounting information systems using non-financial indicators in the context of SMEs. Then, the findings suggested practical implications that SMEs should concentrate on system quality, information quality, and usefulness to enhance accounting information system quality. Second, the influence of accountant resource accounting information system quality suggested improvements in accountant competence and enlargement of the relationship between accountant and firm.

This study has a limitation, we evaluated the impact of accountant resource on accounting information system quality in SMEs without detailing the effect of firm size. Meanwhile, Decree No. 39/2018/ND-CP classifies Vietnamese SMEs into micro, small and medium enterprises (Government, 2018), and firm size has a moderating effect on the business model (Aguilar-Fernández & Otegi-Olaso, 2018). Thus, further research needs to focus on accounting information system quality under the impact of accountant resources between these types of SMEs.

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