

Effect of Accounting Information Quality on Decision-Making Efficiency, Total Quality Management and Corporate Success in Automobile Manufacturing and Exporting Companies

ผลกระทบของคุณภาพของข้อมูลทางบัญชีที่มีต่อประสิทธิภาพการตัดสินใจและการบริหารคุณภาพโดยรวมและส่งผลไปยังความสำเร็จของบริษัทที่ผลิตและส่งออกรถยนต์

Dr. Kanthana Ditkaew

Associate Professor of Accounting Academic Department,
Faculty of Business Administration and Liberal Arts,
Rajamangala University of Technology Lanna Tak, Thailand

ดร. กันตนา ดิษฐ์แก้ว

รองศาสตราจารย์ประจำสาขาวิชาการบัญชี คณะบริหารธุรกิจ
มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา ตาก
E-mail: dr.noon@rmutl.ac.th, Ph: 063 - 926-5154

วันที่ได้รับต้นฉบับบทความ	: 12 เมษายน 2565
วันที่แก้ไขปรับปรุงบทความ	
ครั้งที่ 1	: 17 มิถุนายน 2565
ครั้งที่ 2	: 25 สิงหาคม 2565
วันที่ตอบรับตีพิมพ์บทความ	: 30 สิงหาคม 2565

Thared Santatiwongchai

Head of Department of Accounting,
Faculty of Business Administration, Rajamangala University of Krungthep, Thailand
(Corresponding Author)

ธเรศ สันตติวงศ์ไชย

หัวหน้าสาขาวิชาการบัญชี คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลกรุงเทพ
E-mail: thared.s@mail.rmutk.ac.th , Ph: 085 - 349-6664
(ผู้ประสานงานหลัก)

Abstract

The purposes of this research were to examine: the indirect effect of accounting information quality on the corporate success through decision-making efficiency and total quality management, and the direct effect of accounting information quality on decision-making efficiency and total quality management of automobile manufacturing and exporting companies. A total of 310 management level of automobile manufacturing and export companies were chosen and gathered as the sample in the study.

The results of the Ordinary Least Squares (OLS) regression revealed that accounting information quality, which composed of on time, relevant decision making, and faithful representation aspects, were positively related to companies' decision-making efficiency and company achievement. In addition, the accounting information quality aspect and the relevant and faithful representation in a simple format aspect were positively related to total quality management and company achievement. The result of the study can be the guideline for management level of automobile manufacturing and export companies for initiating decision-making efficiency and total quality management skills. Moreover, management level of automobile manufacturing and export companies should pay attention to the on time aspect; and the relevant and faithful representation in a simple and understandable format aspect, which play a major role of being positive related to total quality management and company achievement of automobile manufacturing and export companies.

Keywords: Accounting Information Quality, Decision-Making,
Total Quality Management, Success of Companies

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อทดสอบผลกระทบของลักษณะเชิงคุณภาพของข้อมูลทางบัญชีผ่านตัวกลางประสิทธิภาพการตัดสินใจและการบริหารจัดการคุณภาพโดยรวมที่มีต่อความสำเร็จ และผลกระทบของลักษณะเชิงคุณภาพของข้อมูลทางบัญชีที่มีต่อประสิทธิภาพการตัดสินใจและการบริหารจัดการคุณภาพโดยรวมของบริษัทผลิตและส่งออกรถยนต์โดยกลุ่มตัวอย่างที่ทำการศึกษาและเก็บรวบรวมข้อมูลในครั้งนี้ คือ ผู้บริหารบริษัทที่ผลิตและส่งออกรถยนต์ จำนวน 310 ท่าน

ผลการวิจัยจากการวิเคราะห์การถดถอยแบบการประมาณค่าพารามิเตอร์ด้วยวิธีกำลังสองน้อยที่สุด พบว่า คุณภาพของข้อมูลทางบัญชีด้านความทันต่อเวลา ด้านความเกี่ยวข้องกับการตัดสินใจ และด้านความเป็นตัวแทนอันเที่ยงธรรม มีผลกระทบทางบวกต่อประสิทธิภาพการตัดสินใจและส่งไปยังความสำเร็จของบริษัท นอกจากนี้คุณภาพของข้อมูลทางบัญชีด้านความเกี่ยวข้องกับการตัดสินใจ และด้านความเป็นตัวแทนอันเที่ยงธรรมที่นำเสนอในรูปแบบที่ง่ายและสามารถเข้าใจได้ ส่งผลกระทบทางบวกต่อการบริหารคุณภาพโดยรวมและส่งไปยังความสำเร็จของบริษัทที่ผลิตและส่งออกรถยนต์ ผลการวิจัยนี้สามารถใช้เป็นแนวทางให้ผู้ประกอบการบริษัทผลิตและส่งออกรถยนต์ เป็นข้อมูลเพื่อการตัดสินใจและบริหารจัดการคุณภาพของข้อมูลทางบัญชีให้ประสบความสำเร็จ ตลอดจนการให้ความสำคัญกับด้านความทันต่อเวลา และด้านเป็นตัวแทนอันเที่ยงธรรมที่นำเสนอในรูปแบบที่เข้าใจง่าย ซึ่งมีผลกระทบโดยตรงกับบริหารคุณภาพโดยรวมและความสำเร็จของบริษัทที่ผลิตและส่งออกรถยนต์

คำสำคัญ: คุณภาพของข้อมูลทางบัญชี, การตัดสินใจ, การบริหารคุณภาพโดยรวม, ความสำเร็จของบริษัท

Introduction

Exports are crucial for a country's economic success. Thailand has an economy based on exports, and its economic policy emphasizes creating competitive advantages and strengthening the business sector, both of which are beneficial to the country's economic and social development. Furthermore, Thailand's recent economic expansion has relied on growth in the export sector as its main driving force. In 2018, Thailand's exports accounted for 77.28% of its gross domestic product (GDP) (Ministry of Commerce, 2019). Thailand's top ten export products for 2020 have automobiles listed as the most popular export item, and exports are expected to rise by May 2021 (The Federation of Thai Industries, Corporate Communications Department. (2021)). However, two risks must be addressed when exporting: (1) COVID-19 outbreaks in Thailand's trading partners, where uncertainty remains, and (2) the shortage of electronic chips from the world's major manufacturing plants, where the situation remains unresolved, which may affect chip allocation planning for factories all over the world (Kasikorn Research Center, 2021). Therefore, Thailand needs to accelerate the development of zero-emission vehicle (ZEV) technology in the future, as Thai automobile exports in the same key market may face increased competition from other manufacturers, including steps that will stifle exports, which are expected to grow.

For management to be effective and create a competitive advantage in the automotive export market in such a fierce and fast competitive environment, the situation depends on several factors. Starting with administration alone may not be sufficient. On the other hand, executives must be responsible for making excellent decisions and managing duties (Ditkaew, 2015). An important factor in complete and comprehensive management is accounting information for management because the account works in concert with business activities to demonstrate the company's progress and growth. Managerial accounting information is useful for business executives and staff to plan, regulate, and make correct, appropriate, and timely decisions to meet the organization's highest goals (Ditkaew, 2015). In 2015, the Federation of Accounting Professions published a conceptual framework for financial reporting that focused on the qualitative features of useful financial data. The information must be provided with four extra qualitative features in addition to the basic qualitative characteristics of relevance to decision-making and faithful representation. These four complementary qualitative features improve the utility of information supplied to managers in making informed planning and control decisions (Federation of Accounting Professions, 2013), conform to sound management principles, and support the present business operation, which has evolved from the traditional business.

Furthermore, accounting data are used in production by combining production cost data produced from estimates or predicting sales with import production forecasts and informing them of the raw materials that must be ordered. To determine the selling price, we add together the costs of raw materials, direct labor, and manufacturing overhead. As a result, the importance of accounting information quality presentation for management reasons is recognized in this study. This is because the way administrative accounting data are presented varies depending on the demands of the information user, type of firm, and executives' objectives and visions. Considering that the executives of each department are not directly in charge of accounting, accounting information has not been adequately exploited for the benefit of management. Alas, a management that does not follow the policy nor accomplish the organization's goals may be ineffective.

This study aims to determine whether the quality of accounting information impacts decision-making efficiency and total quality management to help automobile manufacturing and exporting companies succeed. Therefore, this research investigates the consequences of accounting information quality, specifically how it affects decision-making efficiency and total quality management when organizations encounter a situation such as a pandemic.

Research Objectives:

1. To test the effect of the accounting information quality on the decision-making efficiency of automobile manufacturing and exporting companies.
2. To test the effect of decision-making efficiency on the success of automobile manufacturing and exporting companies.
3. To test the effect of the accounting information quality on the Total Quality Management of automobile manufacturing and exporting companies.
4. To test the effect of Total Quality Management on the success of automobile manufacturing and exporting companies.

Research Questions:

1. How does the accounting information quality affect the decision-making efficiency of automobile manufacturing and exporting companies?
2. How does decision-making efficiency affect the success of automobile manufacturing and exporting companies?
3. How does the accounting information quality affect the Total Quality Management of automobile manufacturing and exporting companies?
4. How does Total Quality Management affect the success of automobile manufacturing and exporting companies?

Literature Review

Resource-based View (RBV) Theory

The resource-based view of a firm explains how businesses are interested in internal resources. For organizations to achieve a competitive edge during business operations, resources should be considered. This edge should be developed and planned based on the available resources to compete in cost with the product, be different from competitors, and adapt to changes in the surrounding environment. According to Barney (1991), the term "resources" relates to an organization's assets, capabilities, work procedures, firm attributes, information, and knowledge. The RBV must have an important factor in the capacity and resources of the organization, which is unique; unity and assets are hard to find. To achieve a competitive advantage, one must have a high sense of self-worth that is difficult to mimic or substitute. The RBV of the firm is a conceptual framework (Figure 1) for examining the qualitative aspects of the accounting data used in this study. This framework is considered the idea of knowledge resources that can help people make better business management decisions in the twenty-first century, thereby advancing manufacturing and contributing to the company's success.

Accounting Information Quality and Consequences

Businesses must remodel their organization and management style in the increasingly competitive economic climate of firms that developed during the COVID-19 outbreak. Operational strategies must rely on executives' capacity to effectively conduct management functions. Based on the necessity and rationale for needing accounting information for management, accounting information is divided into two categories: financial and management accounting information. Executives who obtain accounting data will be able to use these data to make decisions that will help them manage their businesses more effectively, thereby giving them a competitive advantage (Ditkaew, 2019). Florin-Constantin (2013) stated that accounting data aid decision-making. Accounting information is used in various ways, but the need for high-quality accounting data can be considered in economic decision-making. For this research, we use the conceptual framework project summary on the criteria of useful financial data, which are basic qualitative features of the information that must be conveyed, such as faithful representation and relevance to decision-making.

There are four additional qualitative factors to consider: comparability, verifiability, timeliness, and understandability (Federation of Accounting Professions, 2013). For efficient decision-making in the three areas, the qualitative qualities of the accounting information indicated above must be conveyed to management. First, the primary function of planning is to determine the objectives and alternatives for guidance. Both short- and long-term goals can be achieved through the budgeting process. The budget process will aid in the creation of a quantitative work plan to develop a strategy and serve as the foundation for all subsequent actions in primary functions (Ditkaew, 2015; Suriyasarn, 2016). Second, for directing, it is the responsibility of management to issue orders to fulfill the objectives set forth; thus, there must be a strategy and method of ordering in place to ensure that each party's responsibilities are carried out smoothly. In addition, management must inspire employees to work together to achieve a common goal and make choices to attain the utmost efficiency in achieving the organization's goals (Ditkaew, 2022). Third, for control, the management's responsibility is to guarantee that the activities are carried out according to the plan. By establishing a performance standard and comparing the actual performance report to the established work plan, the efficiency of the operation can be determined to ascertain how effectively the plan has met its objectives and decide if there are any flaws that need to be addressed (Ditkaew, 2015; Lebedev, 2015). Thus, this process leads to the following hypothesis:

Hypothesis 1a: An organization with greater relevant accounting information quality, the higher level of decision-making efficiency.

Hypothesis 1b: An organization with greater accounting information quality that provides faithful representation, the higher level of decision-making efficiency.

Hypothesis 1c: An organization with greater accounting information quality that provides comparability, the higher level of decision-making efficiency.

Hypothesis 1d: An organization with greater verifiable accounting information quality, the higher level of decision-making efficiency.

Hypothesis 1e: An organization with more timely accounting information quality, the higher level of decision-making efficiency.

Hypothesis 1f: An organization with greater accounting information quality that has a simple format, the higher level of decision-making efficiency.

Hypothesis 2a: An organization with greater accounting information quality that is relevant, the higher level of TQM.

Hypothesis 2b: An organization with more faithfully represented accounting information quality, the higher level of TQM.

Hypothesis 2c: An organization with greater comparable accounting information quality, the higher level of TQM.

Hypothesis 2d: An organization with greater verifiable accounting information quality, the higher level of TQM.

Hypothesis 2e: An organization with more timely accounting information quality, the higher level of TQM.

Hypothesis 2f: An organization with greater accounting information quality that has a simple format, the higher level of TQM.

Decision-Making Efficiency and Success of Companies

Decision-making is the process of choosing one of the alternatives. The executive role is essential to an organization's business operations. Therefore, having good information and tools with access to data collection and analysis will help managers consider alternatives accurately and quickly and resolve problems effectively, making the most appropriate decisions. Moreover, decision-making in the modern economic system that all businesses face is an immense challenge for executives. As a result, it is more difficult to stay in business and achieve its objectives. Many aspects are involved in a business's ability to succeed in the face of such challenges and to have a professional network. Work systems must also have international standards as vital infrastructure to assist firms in gaining long-term advantages with strong partners (Ditkaew, 2019). It is a thriving business that conducts performance measurements by utilizing high-quality accounting information to aid in planning, control, ordering, decision-making, and cost control. Performance evaluations will assist us in comprehending the existing status of the company while helping it acquire a long-term competitive advantage (Ditkaew & Jersittiprasert, 2021). In this case, more information is available, along with management accounting information. The more decisions the manager makes, the more accurate the decision is. In this case, the more accurate the planning, the better the management's performance. Basically, the management's performance is influenced by the nature of the management accounting system data (Hardika et al., 2021).

In addition, Putri (2018) indicates that managers' decisions have a significant impact on organizational performance and success. Efficiency and effectiveness ultimately have a positive effect on a company's bottom line. Putri (2018) shows that decision-making success influences financial and non-financial performance. A company's performance is a view of its overall status over a period of time, as the company's operating activities influence its achievements in the use of its resources (Dyahrini et al., 2021). A company's performance is determined by the management of processes or operational activities that require everyone in the organization to do their jobs to the best of their abilities. To produce high-quality work, performance must meet the goals set out with efficiency and full capacity. The success of the company in this investigation was determined by (1) goal accomplishment, (2) resource management, (3) internal processes and operations, and (4) customer satisfaction. All four aspects provide useful information and instructions that demonstrate the necessity of implementing business growth. By examining each aspect of flaws or weakness, it is implied that the problem analysis model is the source of the problem determination, that is, what occurred or did not occur in accordance with the objectives. Once the problem has been recognized, operational goals or procedures may proceed with the troubleshooting process to further improve the firm. Thus, this study proposes the following research hypothesis:

Hypothesis 3: An organization with decision-making efficiency will achieve company success.

Total Quality Management (TQM) and Success of Companies

Every firm should place a premium on its quality. Quality contributes to the creation and maintenance of a competitive edge. Total quality management (TQM) is a concept and method for leading a company to excellence and is a management style that prioritizes service quality while adhering to a user-centered approach. Furthermore, by employing scientific concepts, a concern about the impact on quality arises; the organization has the personnel, teamwork, continuous improvement, and employee training attached to it, all of which allow employees to work independently. Its unifying goal is to encourage operators to participate and enable them to work independently (Goetsch & Davis, 1994).

Additionally, Macdonald (1993) stated that total quality management is a change agent with the aim of motivating people to work systematically. Thus, total quality management is a management approach that focuses on the organization's total efficiency to consistently meet customer expectations in terms of product or service quality through a process that stresses that everyone is engaged in the company, based on the three fundamental principles of quality orientation, process improvement, and total involvement. It can be seen that TQM is customer-centric; hence, companies often use it to improve operational efficiency (Hardika et al., 2021). Sunarni (2013) researched the impact of TQM on management performance in an organization and found that the application of TQM has a significant positive effect on management performance in leading organizations toward success. This leads us to the following hypothesis:

Hypothesis 4: An organization with greater TQM will achieve company success.

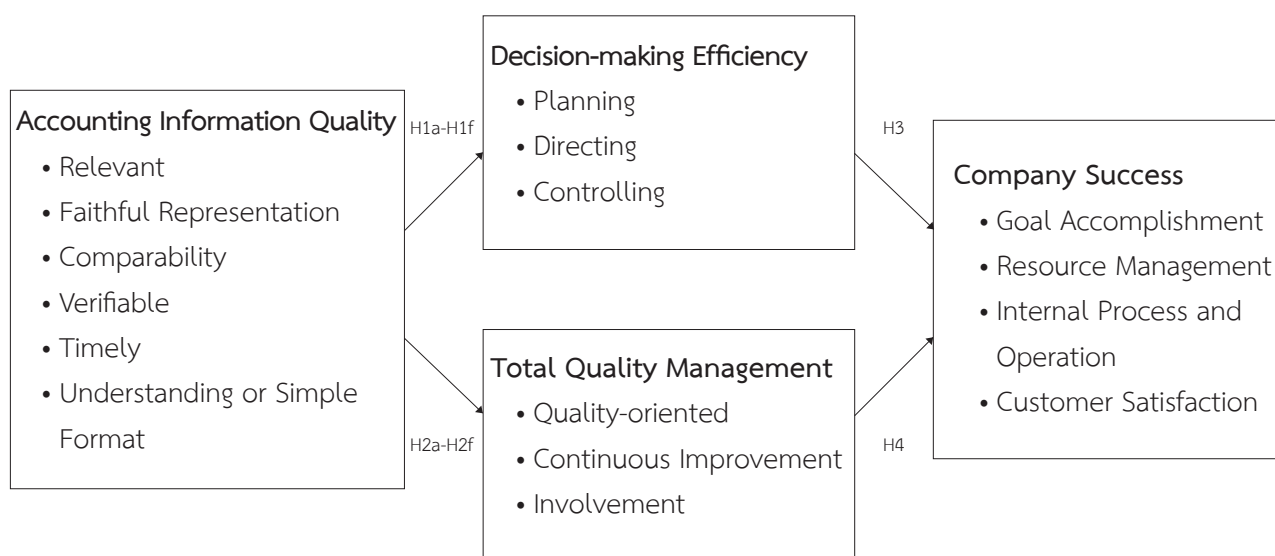


Figure 1: Conceptual Model

The population used in this study consisted of 1,500 automobile manufacturing and exporting companies (Ministry Commerce, Information Technology and Communication Center, 2021). The key informants were executives, directors or managers of automobile manufacturing and exporting companies, which were asked to select 1 person per company. Thus, 1,500 directors or managers of automobile manufacturing and exporting companies are appropriate samples of this study because they can offer different contributions and implications to the existing managerial accounting literature. Regarding the questionnaire mailing, 310 responses were received. The effective response rate was approximately 20.67%. The response rate for a mail survey, with an appropriate follow-up procedure, if greater than 20%, is considered acceptable according to Aaker et al. (2001).

Measures

We used a questionnaire tool to collect data. The general format of a questionnaire provides important data quality for presenting findings, which is essential to confidence levels. The current research collected data using a questionnaire that was established from constructs of the conceptual framework and then operationalized to variables that could be observed in the reality of each construct. A construct can be divided into various dimensions that are measured by multiple items adopted and adapted and identified by items to measure the construct appropriately. All constructs were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. To obtain accounting information quality that was relevant, four scales were developed to measure how characteristics of the company's information are related to decision-making. For accounting information quality that was a faithful representation, five scales were developed to measure information that is free of bias and is presented correctly and reliably. For accounting information quality that demonstrates comparability, three scales were developed to measure information characteristics that can be compared over time or against other companies. For accounting information quality that was verifiable, three scales were developed to measure data qualities and sources that could be verified. For accounting information quality that is timely, four scales were developed to measure the attributes of timely information to make decisions and immediately apply them. For accounting information quality in a simple format, four scales were developed to measure the characteristics of relevant information supplied in a readily understandable format based on the context. To measure the decision-making efficiency of planning, five scales were developed to measure decision making during the planning process and to assess the plan. For decision-making efficiency of directing, four scales were developed to measure ordering assignment tasks to employees, as well as ordering efficiency. For controlling decision-making efficiency, five scales were developed to measure how forecasting, and budget control was aided by historical data analysis. For total quality management (TQM), eight items were developed to measure continuous improvement, quality-oriented resources, and total involvement. To measure companies' success, eighteen scales were developed, namely, four scales to measure customer satisfaction, five scales to measure internal process and operation, four scales to measure resource management, and five scales to measure goal accomplishment. The conceptual model in this research contained several important controls. Control variables were treated as background characteristics of a firm that might potentially influence either accounting information quality, the success of companies, or both. The control variables were firm size, firm age, and firm capital. Firm size indicated the scale of a firm, which might be positively correlated with the accounting information quality and success of companies, while firms of different sizes might be affected by government regulations. Furthermore, firm age indicated that older organizations might be restricted by earlier investment in information, and such firms probably employ older and less-skilled employees. In addition, differences in firm capital due to differences in large and small capital may affect the quality of accounting information. Firm size was measured as the number of employees in the firm averaged over the current year. Firm age was measured as the number of years since the automobile manufacturer was founded. Firm capital was measured by the money or assets used as investment operations within the organizations.

Method

The validity of the item-objective congruence index (IOC) demonstrated that the research tools were appropriate for measuring the objectives (Polit & Beck, 2012). The scale of IOC from three experts was reviewed and had a value ranking of 0.67–1.00 (greater than 0.5). This shows that the questionnaire was consistent, correct, relevant, clear, comprehensive, complete, and language-appropriate. Additionally, to verify the validity and reliability of the research instrument, a factor analysis technique was used to reduce a large number of variables to fewer factors. Factor loadings had values between 0.504 and 0.977, greater than the 0.5 cutoff; thus, they were statistically significant (Hair et al., 2012).

Furthermore, the reliability of the questionnaire as a good-quality instrument was based on pilot tests conducted on 30 automobile manufacturing and export companies that were not included in the final sample, which used Cronbach's alpha (Cronbach, 1990) to revise the questionnaire to ensure its reliability. In this research, the scale reliability and Cronbach's alpha coefficients of all variables in pretesting had a value ranging from 0.926–0.961, which was greater than 0.7 (Hair et al., 2012). The scales of all measures appeared to produce internally consistent results; thus, they were deemed appropriate for further analysis. Table 1 presents the results of factor loading and Cronbach's alpha for the multi-item scales used in this study.

Table 1: Results of Measure Validation

Constructs	Factor Loadings	Alpha	AEV
Accounting Information Quality (AIQ)	.660–.866	.961	.774
Decision-making Efficiency (DE)	.506–.948	.939	.708
Total Quality Management (TQM)	.524–.977	.926	.696
Companies' Success (SSC)	.504–.948	.946	.717

Table 2: Convergent and Discrimination Validity

Constructs	AIQ	DE	TQM	SSC
Accounting Information Quality (AIQ)	.880			
Decision-making Efficiency (DE)	.429	.841		
Total Quality Management (TQM)	.367	.752	.834	
Companies' Success (SSC)	.441	.773	.701	.847

After the data were collected, descriptive statistics were used to present the exploratory findings, such as mean, standard deviation, and correlation matrix. The conceptual model was analyzed using regression analysis to analyze the relationship between the dependent and independent variables. Ordinary least squares (OLS) regression analysis was used to test the hypotheses. A number of equations were formulated to examine all the relationships related to the hypotheses on each sub model. All these equations were based on the regression analysis statistical method formulated as follows:

The investigation relationship between accounting information quality and decision-making efficiency was formulated in Equation 1 to conclude Hypotheses 1a-1f as follows:

Equation 1:

$$DE = \beta_{01} + \beta_1 RE + \beta_2 FR + \beta_3 CP + \beta_4 VE + \beta_5 TM + \beta_6 SF + \beta_7 FS + \beta_8 FA + \beta_9 FC + e$$

The investigation relationship between accounting information quality and total quality management is formulated in Equation 2 to conclude Hypotheses 2a-2f as follows:

Equation 2:

$$TQM = \beta_{02} + \beta_{10} RE + \beta_{11} FR + \beta_{12} CP + \beta_{13} VE + \beta_{14} TM + \beta_{15} SF + \beta_{16} FS + \beta_{17} FA + \beta_{18} FC + e$$

The investigation relationship between the decision-making efficiency and success of companies is formulated in Equation 3 to conclude Hypotheses 3 as follows:

Equation 3:

$$SSC = \beta_{03} + \beta_{19} DE + \beta_{20} FS + \beta_{21} FA + \beta_{22} FC + e$$

The investigation relationship between total quality management and the success of companies is formulated in Equation 4 to conclude Hypothesis 4 as follows:

Equation 4:

$$SSC = \beta_{04} + \beta_{23} TQM + \beta_{24} FS + \beta_{25} FA + \beta_{26} FC + e$$

where RE is accounting information quality that is relevant, FR is accounting information quality that is a faithful representation, CP is accounting information quality that has comparability, VE is accounting information quality that is verifiable, TM is accounting information quality that is timely, SF is accounting information quality that has a simple format, DE is the decision-making efficiency, TQM is the total quality management, and SSC is the company's success. The control variables are FS (firm size), FA (firm age), and FC (firm capital).

Result and Discussion

Table 3 presents the descriptive statistics and the correlation matrix for all the variables. Multicollinearity is a situation where two or more predictors are highly linearly related.

Table 3: Descriptive Statistics and Correlation Matrix

Variables	AIQ	DE	TQM	SSC
Mean	4.30	4.29	4.19	4.26
Standard Deviation	0.50	0.49	0.53	0.45
Accounting Information Quality (AIQ)				
Decision-making Efficiency (DE)	.197**			
Total Quality Management (TQM)	-.293**	.740**		
Companies' Success (SSC)	.197**	.667**	.693**	

** Correlation is significant at the .01 level.

In general, an absolute correlation coefficient of >0.8 among two or more predictors indicates the presence of multicollinearity (Hair et al., 2010). The correlations ranged between 0.197 and 0.74 at a p-value = 0.01 significance level, which means that the possible relationships of the variables in the conceptual model could be tested. Therefore, no substantial multicollinearity problems were encountered in this study.

Table 4 presents the results of the ordinary least squares (OLS) regression analysis of the effect of accounting information quality with certain dimensions, namely relevance, faithful representation, comparability, verifiability, timeliness, and a simple format on decision-making efficiency. The results show that the variables of relevance, faithful representation, and timeliness have a significant positive effect on decision-making efficiency (Model 1: $\beta_1=0.084$, $p<.05$, $\beta_2=0.184$, $p<.05$, $\beta_5=1.041$, $p<.01$). Thus, Hypotheses 1a, 1b, and 1e were supported.

Table 4: Results of Regression Analysis for Test Hypotheses H1a-H1f and H3

Independent Variables	Dependent Variables	
	DE	SSC
Accounting Information Quality (AIQ)		
Relevant	.084** (.041)	
Faithful Representation	.184** (.084)	
Comparability	-.030 (.067)	
Verifiable	-.030 (.077)	
Timely	1.041*** (.089)	
Simple Format	1.062 (.103)	
Decision-making Efficiency (DE)		452*** (.033)
Firm Size (FS)	.146 (.091)	.140 (.088)
Firm Age (FA)	-.061 (.086)	-.120 (.084)
Firm Capital (FC)	-.106 (.085)	-.093 (.083)
Adjusted R ²	.879	.974
SEE	.347	.163
Sig. of F = .000, **p<.05, ***p<.01		

As a result, accounting information quality that is relevant, faithful, and timely is constructed as a tool for decision-making efficiency in all three dimensions of companies. Consequently, executive managers receive valuable accounting information in accordance with the conceptual framework project summary to convey data on essential qualitative features such as decision-making relevance and faithful representation (Federation of Accounting Professions, 2013). The issue of timeliness must be addressed as a qualitative factor because firms confronted with changes in the market environment, unforeseen circumstances, and high competition need to be informed swiftly and in time to make decisions. According to Florin-Constantin (2013), accounting information assists in decision-making. Accounting information is used in various ways, but the need for high-quality accounting data can be considered in economic decision-making (Vardon et al., 2018). Therefore, it is essential to recognize that data need to be more accurate and that there are aspects of quality, such as relevance, timeliness, accessibility, coherence, faithful representation of the budget process, set objectives, and alternatives for both short- and long-term guidelines. Decision-making includes orders to guarantee that each department's responsibilities are met and that operations are carried out as planned (Ditkaew, 2015; Suriyasarn, 2016). However, the quality of accounting information in terms of comparability, verifiability, and simplicity has no bearing on decision making because the quality of accounting information in terms of reliability and faithfulness is based on the qualitative characteristics of useful financial information that must be presented in accordance with the federation of accounting professionals' conceptual framework. Additionally, there is a matter of the quality of the information added for decision-making efficiency, namely, the timeliness aspect.

Moreover, the results show that decision-making efficiency has dimensions, namely, planning, directing, and controlling, which have a significant positive influence on companies' success. Thus, the H3 hypothesis test results are supported (Model 3: $\beta_{19}=0.452$, $p<.01$). Accordingly, Ditkaew & Jersittiprasert (2021) indicate that quality accounting information will assist in understanding the present status of firms and ensuring long-term performance by contributing to planning, managing, directing, decision-making, and cost management. This is in accordance with Dahal's (2019) research, which depicted accounting data's role in the twenty-first century as an information age and knowledge-driven economy that generates competitive advantages. As a result, in a market environment with unforeseen circumstances and competition, a strategic understanding of the decision-making process will aid businesses in achieving their goals. In other words, having solid accounting data for corporate decision-making, whether it is assessing strategy, budgeting, or performance reviews, contributes to the organization's successful performance (Hasan, 2017).

Table 5: Result of Regression Analysis for test hypotheses H2a-H2f and H4

Independent Variables	Dependent Variables	
	TQM	SSC
Accounting Information Quality (AIQ)		
Relevant	.161* (.083)	
Faithful Representation	.407** (.177)	
Comparability	-.330 (.068)	
Verifiable	.234 (.154)	
Timely	.241 (.079)	
Simple Format	.748*** (.207)	
Total Quality Management (TQM)		.894** (.025)
Firm Size (FS)	-.142 (.094)	.073 (.090)
Firm Age (FA)	.148 (.089)	-.104 (.092)
Firm Capital (FC)	-.101 (.091)	-.110 (.090)
Adjusted R ²	.517	.809
SEE	.689	.437
Sig. of F = .000, *p<.10, **p<.05, ***p<.01		

Table 5 presents the results of the ordinary least squares regression analysis of the effect of accounting information quality, which has the dimensions of relevance, faithful representation, comparability, verifiability, timeliness, and a simple format, on total quality management. The results show that relevance, faithful representation, and simple format have a significant positive effect on total quality management; thus, the H2a, H2b, and H2f hypothesis test results are supported (Model 2: $\beta_{10}=0.161$, $p<.10$, $\beta_{11}= 0.407$, $p<.05$, $\beta_{15}=0.748$, $p<.01$). It can be observed that having qualitative data based on the idea of relevant and faithful representation, complemented with qualitative data in a simple format, improves total quality management. The results show that accounting information quality, namely a simple format that presents information in an easily understandable manner, benefits every employee who must strive to improve to provide the finest products and services. Accounting data have two key qualities: relevance and faithful depiction. This is in keeping with the Federation of Accounting Professions' (2013) guidelines, and the quality of the additional data, which are in a simple format, will have an impact on TQM. This outcome adheres to the principle that TQM is a subjective term for which each person has his/her own definition. In technical usage, quality can have two meanings: (1) the characteristics of a product or service that impact its ability to satisfy stated or implied needs, and (2) a product or service that is free of deficiencies (Kano, 1996; Krüger, 2001).

Table 6: Result Summary of Hypotheses Testing

Hypothesis	Items	Standardized Estimate (β)	S.E.	p	Hypothesis Result
H1a	AIQ (Relevant) \rightarrow DE	.084	.041	**	Accepted
H1b	AIQ (Faithful Representation) \rightarrow DE	.184	.084	**	Accepted
H1c	AIQ (Comparability) \rightarrow DE	-.030	.067	-	Rejected
H1d	AIQ (Verifiable) \rightarrow DE	-.030	.077	-	Rejected
H1e	AIQ (Timely) \rightarrow DE	1.041	.089	***	Accepted
H1F	AIQ (Simple Format) \rightarrow DE	1.062	.103	-	Rejected
H2a	AIQ (Relevant) \rightarrow TQM	.161	.083	*	Accepted
H2b	AIQ (Faithful Representation) \rightarrow TQM	.407	.177	**	Accepted
H2c	AIQ (Comparability) \rightarrow TQM	-.330	.068	-	Rejected
H2d	AIQ (Verifiable) \rightarrow TQM	.234	.154	-	Rejected
H2e	AIQ (Timely) \rightarrow TQM	.241	.079	-	Rejected
H2f	AIQ (Simple Format) \rightarrow TQM	.748	.207	***	Accepted
H3	DE \rightarrow SSC	.0452	.033	***	Accepted
H4	TQM \rightarrow SSC	.894	.025	**	Accepted

Note: *, ** and *** refer to the significant level as of .10, .05 and .01, respectively

Furthermore, high-quality data based on the principles of relevance to decision-making and fair representation can aid in the development of problem-solving processes that are critical to TQM's success. Regarding the company's impact in dealing with high competition, it should prioritize and focus on qualitative data to achieve success in TQM, including quality-oriented resources, process improvement, and total involvement. This is one of the techniques used by a company to acquire a competitive advantage. Table 5 shows that TQM has a significant positive effect on companies' success; thus, the H4 hypothesis test result is supported (Model 4: $\beta_{23}=0.894$, $p<.05$). This is in accordance with Kunst & Lemmink (2000), who discovered a link between TQM and improved business performance. Alaraki (2014) found that TQM has a statistically significant effect on performance.

Theoretical Contribution and Future Research Directions

This research confirms that the resource-based view of the firm is a valuable theory that can clarify and verify the effect of accounting information quality's three major dimensions, namely relevance, faithful representation, and timely decision-making effectiveness, which lead to companies' success. Moreover, accounting information quality is affected by the three major dimensions of relevance—a faithful representation and a simple format—on TQM, which leads to companies' success. In other words, information is an organizational asset with intrinsic value and is difficult to imitate or replace to gain a competitive advantage. In this study, accounting information quality, decision-making efficiency, TQM, and company success were input into the same conceptual model. All research relationships were empirically confirmed. This study focuses on the concept of accounting information quality. To expand the understanding of decision-making, TQM, and companies' success, future research needs to create antecedents of accounting information quality as it relates to the competitive situation, which has forced an era of disruptive technology. In addition, future research may need to add a moderator that affects the relationship between accounting information quality and decision-making efficiency and use the competitive advantage concept to build dimensions. To test the generalizability of future research, a comparative study may be conducted to test the direct and indirect effects of the research relationship and compare the results to yield more benefits and increase the generalization of the study. Moreover, firm executives can apply and utilize accounting information as a valuable tool for building companies' sustainable success.

Managerial Implications

Owing to the impact of a highly competitive situation on businesses, accounting information must be presented faster than ever to enable executives to make planning, directing, and controlling decisions effectively. Two major dimensions of accounting information quality that evolve from a conceptual framework project summary, faithful representation, and relevance to decision-making, are important for companies' success in achieving TQM and effective decision-making. They also aid businesses in surviving, sustaining, and adapting to the pandemic and a highly competitive situation. Accordingly, the results of this study reflect the importance of information for decision-making and quality management in uncertain situations. If a corporation has built an accounting database, it will be aware of the data types that can be useful to the company and, therefore, use them as valuable tools in company operations. Likewise, executives need to encourage their staff, especially accounting staff, to focus on accounting information quality. In addition, they must be informed of the benefits of accounting information quality. More importantly, the results demonstrate that having information in a simple format that is easy to understand enables managers and employees to use that data for continuous development, which is in accordance with the TQM principle.

Conclusion

Many businesses have been compelled to change due to changes in the market environment, unforeseen circumstances, and high competition. Information that is both helpful and of high quality can aid an organization's survival. Interestingly, this study investigates the effect of accounting information quality on decision-making efficiency through companies' success and the effect of accounting information quality on TQM through companies' success with automobile manufacturing and exporting companies in a highly competitive situation in Thailand. A total of 310 companies were selected for the study sample. The results of the study show that accounting information quality has the dimensions of relevance, faithful representation, and timely decision-making efficiency, which lead to companies' success.

Furthermore, the study results show that accounting information quality has the dimensions of relevance, faithful representation, and simple format with regard to TQM, which leads to companies' success. Both decision-making and TQM usefulness are mediators of the accounting information quality-company success relationship. However, future research must create antecedents for the effect on accounting information quality and use the competitive advantage concept to build dimensions. Moreover, firm executives can apply and utilize accounting information as a valuable tool for building companies' sustainable success.

References

- Aaker, D.A., Kumar, V., & Day, G.S. (2001). *Marketing Research* (7th ed). New York: John Wiley and Sons.
- Alaraki, M. S. (2014). The Impact of Critical Total Quality Management Practices on Hospital Performance in the Ministry of Health Hospitals in Saudi Arabia. *Quality Management in Health Care*, 23(1), 59-63.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99-120.
- Cronbach, L. J. (1990). *Essentials of Psychological Test*. (5th ed.). New York: Harper Collins.
- Dahal, R. K. (2019). Changing role of management accounting in 21st Century. *Review of Public Administration and Management*, 7(3), 1-8.
- Ditkaew, K. (2015). Managerial Accounting Quality, Management Innovation, Productivity and Competitive Advantage of Rice Mill Businesses in North Region, Thailand. *Journal of Modern Management Science*, 8(1), 47 – 66.
- Ditkaew, K. (2019). Managerial Accounting Information Competencies of Sugarcane Planting in Thailand. *Asian Administration and Management Review*, 2(1), 135-151.
- Ditkaew, K., & Jernsittiparsert, K. (2021). The Influence of Managerial Accounting Information Quality on Supply Chain Management Competency for Sustainable Competitive Advantage of Cassava Processing Companies in Thailand. *Social Science Journal of Prachachuen Research Network*, 3(2), 14-26.[in Thai]
- Ditkaew, K. (2022). *Managerial Accounting*. Bangkok: CU Press. [in Thai]
- Dyahrini, W., Mauludin, M, S., Ichsan, C., & Sinaga, O. (2021). Supply Chain Management, Competitive Advantage on Performance of SME Companies in Bandung, West Java. *Review of International Geographical Education*, 11(5), 820-828. doi: 10.48047/rigeo.11.05.77
- Federation of Accounting Professions. (2013, Nov 6). The revised Conceptual Framework for Financial Reporting. <https://acpro-std.tfac.or.th/uploads/files/NOxolsj0qL.pdf> [in Thai]
- Florin-Constantin, D. (2013). The Users of Accounting Information and Their Needs. *Anale. Seria Stiinte Economice. Timisoara*, 19, 200-204.

- Goetsch, D. L., & Davis, S. (1994). *Introduction to Total Quality: Quality, Productivity, Competitiveness*. New Jersey: Prentice Hall Inc.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010) *Multivariate data analysis*. (7th ed). New Jersey: Prentice Hall.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the academy of marketing science*, 40(3), 414-433.
- Hardika, A. L., Ellen, L. D., Nuralif, N. I., Pangaribuan, I. D., Dewi, S., & Nugroho, D. (2021). Total Quality Management and Characteristics of Management Accounting Information on *Managerial. Review of International Geographical Education*, 11(3), 1627-1632. doi: 10.48047/rigeo.11.3.157
- Hasan, A. H. (2017). The Effect of Exchange Rate Policy, Equilibrium Model Oil Shocks and Income Tax on GCC Economies Using Computable General. *Плехановский барометр*, (3), 56-60.
- Kano, N. (1996). *Guide to TQM in service industries*. Tokyo: Asian Productivity Organization.
- Kasikorn Research Center. (2021, June 15). *Chinese automakers are increasingly investing in Thailand, providing opportunities and expanding the Thai auto export industry*. <https://kasikornresearch.com/th/analysis/k-social-media/Pages/China-Auto-mobile-15-06-21.aspx>. [in Thai]
- Krüger, V. (2001). Main schools of TQM: “the big five”. *The TQM magazine*, 13(3), 146-155.
- Kunst, P., & Lemmink, J. (2000). Quality Management and Business Performance in Hospitals: A Search for Success Parameters. *Total Quality Management*, 11(8), 1123-1133.
- Lebedev, P. (2015). Getting Insight into Management Accounting and Control Systems: A Framework for Survey-based Research Design for Emerging Markets Context. *Procedia - Social and Behavioral Sciences*, 213, 293-298.
- Ministry of Commerce. (2019, September 9). *Propel International Trade: Create Wealth for Thai Economy*, Annual Report 2019, 73-80. <https://www.moc.go.th/th/ebook/category/detail/id/1/iid/4>. [in Thai]
- Ministry Commerce, Information Technology and Communication Center. (2021). *List of Thai Exporters Classified by Product, Cars, Equipment and Components for the Month of January - June 2021*. <https://ietrade.moc.go.th/>. [in Thai]
- Polit, D. F., & Beck, C. T. (2012) *Nursing research: Generating and assessing evidence for nursing practice*. Philadelphia, PA: Lippincott Williams& Wilkins.
- Putri, P. N. (2018). Effect of Accounting Information System for Internal Control «Sippuh Online» in Pt. Dwimajaya Utama. *Russian Journal of Agricultural and Socio-Economic Sciences*, 80(8), 167-171.
- Sunarni, C. W. (2013). Management Accounting Practices and the Role of Management Accountant: Evidence from Manufacturing Companies Throughout Yogyakarta, Indonesia. *Review Integrative Business & Economics Research*, 2(2), 616-626.
- Suriyasarn, T. (2016). Effects of Managerial Accounting Information Implementation on Operational Success of the Hotel Businesses in Thailand. *Journal of Accountancy and Management*, 8(2), 127 – 140. [in Thai]

The Federation of Thai Industries, Corporate Communications Department. (2021, June 24). May 2021: Production of 140,168 cars increased by 150.14 percent, Sales of 55,942 units increased by 38.4 percent, and Exports of 79,479 units increased by 165.87 percent. <https://fti.or.th/2021/06/24/%E0%B9%80%E0%B8%94%E0%B8%B7%E0%B8%AD%E0%B8%99%E0%B8%9E%E0%B8%A4%E0%B8%A9%E0%B8%A0%E0%B8%B2%E0%B8%84%E0%B8%A1-2564-%E0%B8%9C%E0%B8%A5%E0%B8%B4%E0%B8%95%E0%B8%A3%E0%B8%96%E0%B8%A2%E0%B8%99%E0%B8%95/> [in Thai]

Vardon, M., Castaneda, J. P., Nagy, M., & Schenau. (2018). How the System of Environmental-Economic Accounting can improve environmental information systems and data quality for decision making. *Environmental Science and Policy*, 89, 83-92.

Appendix

Table 1A: Opinion on accounting information quality.

Relevant Accounting Information Quality	
Items	Opinion on accounting information quality
r201	The Company has information that is informative in nature that educates the results of previous decisions which can also be used in future judgments.
r202	The Company recognizes the value of the accounting information presented to help predict future outcomes.
r203	The company has information that can be used to make decisions about relevant issues in a timely and demanding manner.
r204	The Company focuses on presenting accounting information that is useful in making economic decisions, by reducing the uncertainty that may arise in the future.
Accounting Information Quality that Faithful Representation	
f201	All information necessary for the user has a complete picture, such as a complete picture of the asset group.
f202	The company attaches importance to the disclosure of accounting information to users who understand it in its entirety.
f203	Accounting information is accurate or able to estimate prices or unobservable value.
f204	The company has accounting information that is complete and accurate according to the needs of users.
f205	All information necessary for the user has a complete picture, such as a complete picture of the asset group.
Accounting Information Quality that Comparability	
c201	The organization adheres to the methodology used in the last fiscal year to make it easy for users to understand.
c202	The company has the accounting information prepared and presented can be compared with historical accounting information to predict future trends in the financial position and performance of the entity.
c203	Accounting data that may be compared to other companies is very important.

Table 1A: Opinion on accounting information quality. (Continued)

Verifiable Accounting Information Quality	
v201	The company's account information can verify balance confirmation and calculate results.
v202	Company accounting information can be verified for accuracy and source.
v203	The works performed are correct according to accounting standards.
Timely Accounting Information Quality	
t201	Company has timely accounting information for users to make decisions on such issues.
t202	The company offers real-time accounting information that allows users to use the information immediately.
t203	The company prepares and submits financial statements within the time specified by law.
t204	Businesses prepare tax document reports in a timely.
Accounting Information Quality that has a Simple Format	
t201	Company has timely accounting information for users to make decisions on such issues.
t202	The company offers real-time accounting information that allows users to use the information immediately.
t203	The company prepares and submits financial statements within the time specified by law.
t204	Businesses prepare tax document reports in a timely.
Accounting Information Quality that has a Simple Format	
s201	The company provides accounting information both internally and externally to provide users with an accurate and complete understanding of the information.
s202	The company focuses on providing accounting information in an easily understandable format to benefit economic decision-making.
s203	The company focuses on providing accounting information and financial reports have a clear and concise classification, preferences, and presentation of information.
s204	The use of accounting information for decision-making must not ignore information that is too complex or difficult.

Table 2A: Opinion on decision making efficiency.

Decision-making Planning Efficiency	
p301	The company can make decisions in planning the accounting information to be analyzed in order to respond effectively to the needs of the customers.
p302	The company has a good decision-making process, able to plan budget plans by the heads of various departments.
p303	The company has the ability to make analytical decisions, formulate long-term action plans to set strategic goals.
p304	The company makes step-by-step decisions that help in strategic planning by clearly categorizing the levels of responsibility.
p305	The company has effective decision making in the preparation of short-term plans to support work on production projects with contracts up to 1 year.

Table 2A: Opinion on decision making efficiency. (Continued)

Decision-making Directing Efficiency	
d301	The company has a directive by pushing employees by motivation under leadership of executive.
d302	Efficient decision-making allows for ordering of assignments in accordance with the given job description.
d303	The company provides written instructions for the order recipient to properly comply with the order.
d304	Effective decision-making helps directing in a way that motivates people to work in a friendly way and that doers are willing to work.
Decision-making Planning Control Efficiency	
ct301	Effective decision making enables analysis of historical data to forecast income and expenses incurred.
ct302	Effective decision-making helps to monitor supervisors to adhere to a consistent action plan.
ct303	Effective decision-making can control the financial budget to help systematically meet performance criteria.
ct304	Effective decision-making can control oversight as well as manage the success of the plan.
ct305	Cost-effective decision-making can be cost controlled by management in accordance with the responsibilities of each party.

Table 3A: Opinion on total quality management.

Total Quality Management	
tqm1	The company attaches great importance to quality management as a whole of the organization.
tqm2	The company focuses on the needs of customers.
tqm3	The company focuses on the work process from the beginning to the end of the work process.
tqm4	The company focuses on continuous improvement of work processes.
tqm5	The company continuously promotes knowledge and provides quality training for personnel.
tqm6	The company allows personnel to participate in making suggestions or expressing opinions for improve and develop the organization
tqm7	The company attaches importance to the use of numerical data and information for consideration and decision making in operations.
tqm8	The company has a system to measure, inspect and monitor the quality of service in order to know the satisfaction of the customers and lead to the benefit of continual improvement in quality.

Table 4A: Opinion on organizational success.

Organizational Success - Achieving goals	
ga501	The company manages the business according to the goals and objectives set.
ga502	The company returns in the form of higher profits than the previous year or meets the expected targets.
ga503	Processes are performed according to the scope of work accurately and reliably.
ga504	The production was completed on time and the work was delivered on time.
ga505	Operations and operational guidelines are clearly tangible to affect the achievement of the goals of the work.
Organizational Success - Resource management	
rm501	The company uses efficient resources resulting in sufficient funds for the implementation of the plans and complete budget management.
rm502	The company's procurement of resources is sufficient, reasonable and timely, saving the time and costs involved.
rm503	The allocation of budget funds is complete and sufficient, resulting in smooth and streamlined operational plans.
rm504	Efficient procurement and use of resources
Organizational Success - The operational process	
ip501	The company has efficient operating procedures.
ip502	The company continuously supports the development of personnel to have skills and expertise to work in order to increase work efficiency.
ip503	The company has developed strategies and work processes to complete in a timely manner.
ip504	The company brings innovation and technology to help work faster.
ip505	The company has adjusted the work procedures appropriately.
Organizational Success - Customer satisfaction	
cs501	The company has been praised and regarded as a model company in management from customers.
cs502	The company is able to continuously better respond to customer needs, resulting in customers coming repurchases.
cs503	The company can accurately respond to the needs of customers in terms of products, resulting in customer satisfaction always.
cs504	The company's market share has increased due to the persistence of existing customers and the continuous increase of new customers.

Table B: Item Factor Loadings and Reliability Analysis in Pre-Test

Contracts	Items	Factor Loading	Reliability (Cronbach's Alpha)
Relevant Accounting Information Quality	r201	.682	.737
	r202	.862	
	r203	.772	
	r204	.660	
Accounting Information Quality that Faithful Representation	f201	.722	.759
	f202	.831	
	f203	.748	
	f204	.595	
	f205	.660	
Accounting Information Quality that Comparability	c201	.759	.730
	c202	.866	
	c203	.788	
Verifiable Accounting Information Quality	v201	.759	.730
	v202	.866	
	v203	.788	
Timely Accounting Information Quality	t201	.685	.739
	t202	.862	
	t203	.774	
	t204	.660	
Accounting Information Quality that has a Simple Format	s201	.862	.739
	s202	.685	
	s203	.774	
	s204	.660	
Decision-making Planning Efficiency	p301	.786	.815
	p302	.836	
	p303	.836	
	p304	.506	
	p305	.786	
Decision-making Directing Efficiency	d301	.554	.770
	d302	.948	
	d303	.948	
	d304	.574	
Decision-making Planning Control Efficiency	ct301	.625	.840
	ct302	.730	
	ct303	.928	
	ct304	.928	
	ct305	.649	

Table B: Item Factor Loadings and Reliability Analysis in Pre-Test (Continued)

Contracts	Items	Factor Loading	Reliability (Cronbach's Alpha)
Total Quality Management	tqm1	.849	.926
	tqm2	.977	
	tqm3	.849	
	tqm4	.977	
	tqm5	.524	
	tqm6	.977	
	tqm7	.958	
	tqm8	.977	
Organizational Success	ga501	.842	.804
	ga502	.583	
	ga503	.765	
	ga504	.844	
	ga505	.764	
	rm501	.931	.751
	rm502	.741	
	rm503	.931	
	rm504	.631	
	ip501	.585	.862
	ip502	.979	
	ip503	.504	
	ip504	.979	
	ip505	.979	
	cs501	.948	.745
	cs502	.948	
	cs503	.581	
	cs504	.514	