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INFORMATION TECHNOLOGY RISK CAPABILITY ON THE AUDIT QUALITY

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Information Technology Risk Capability on the Audit Quality Of the Certified Public Accountant in Thailand

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ABSTRACT

The objective of this research is to examine the relations between Information Technology Risk Capability on Audit Quality via Rich Auditing Information Capability and Auditing Information Value. Data collection is done by sending the questionnaires to Certified Public Accountants (CPAs) in Thailand; measurements of constructs both the validity and reliability use the Ordinary Least Squares (OLS) regression analysis to test the hypotheses relationship and estimate factors affecting the Audit Quality. The results show the Information Technology Risk Capability has positive relationships with Rich Auditing Information Capability, Auditing Information Value, and Audit Quality. Theoretical, managerial and research implications are also discussed.

Keywords: *Information Technology Risk Capability, Rich Auditing Information Capability, Auditing Information Value, Audit Quality*

1. INTRODUCTION

Today's existing technology solutions are also starting to incorporate interfaces and embedded routines that interact with other solutions, such as security applications that manage configurations and entitlements. This is the first step toward moving organizations closer to continuous monitoring and compliance automation. This capability, however, is still not fully functional for many technology solutions on the market today. Many do not interface seamlessly with other solutions, such as an organization's enterprise security management systems, change management tools, and configuration management tools. Auditing is an accepted management technique. Many different types of audits currently exist in the commercial world, e.g. financial audits, communication audits, technical audits, employment audits, and also more recently, information audits (Barnier, B; 2009).

As global institutions seek to link Enterprise Risk Management (ERM), Operational Risk Management (ORM), and audit and compliance functions, information technology risk management will play a critical role. Information technology risk management continues to expand and gain additional focus within financial services organizations. In addition, executive management is continuing to exert pressure on the information technology risk management function, looking for tangible evidence that it is contributing to the improvement of the business and information technology operations (PricewaterhouseCoopers; 2007). Most organizations are expecting a high return on their investment in information technology risk management.

There is a lack of knowledge of the implementation of Information Technology Risk within auditing system and does not find studies that have examined the relationship between the usefulness of auditing information and IT Risk in the audit sector in Thailand, the benefits of implementing such technologies and identification of the best model for implementation in Thailand to focus their attention on the framework, processes, and drivers of information technology risk management , in particular, their impact on decision making and the role information technology risk management plays in an organization's overall risk management processes and informed point of view on the components of an effective information technology risk management methodology, framework, and process.

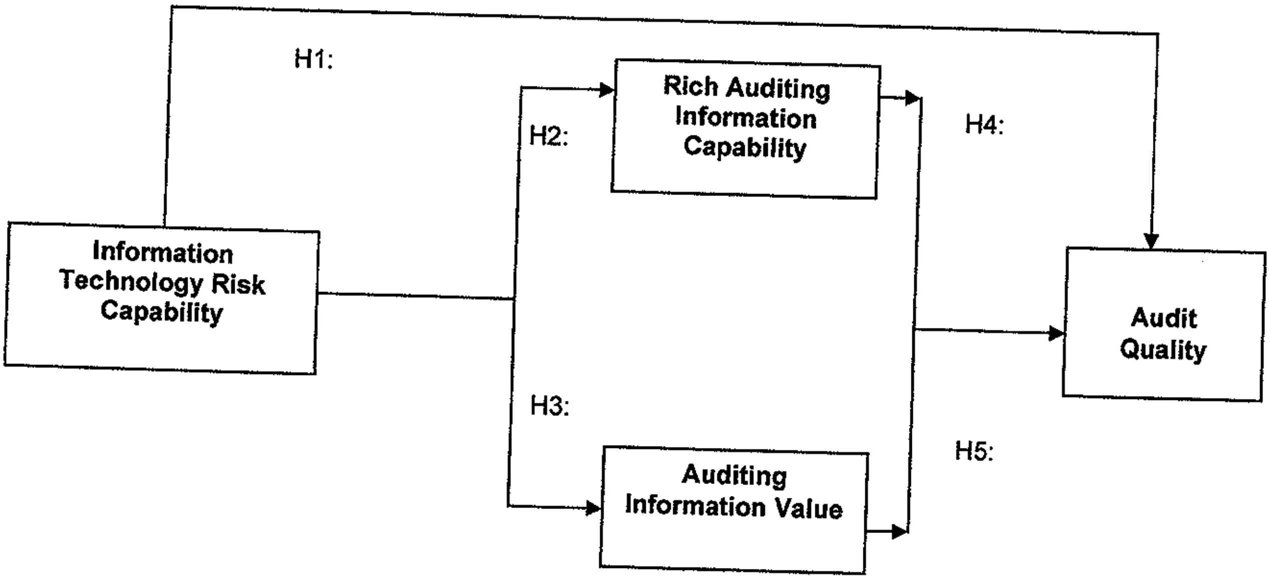
In the next section, the conceptual framework is presented, and a set of testable hypotheses is proposed. Methods of the study are then introduced, which include information about the sample, study measures, data analysis, and test results. Following a discussion of the results, implications and limitations are offered.

2. RELENANT LETERATURE ON INFORMATION TECHNOLOGY GOVERNANCE AND ACCOUNTING PERFORMANCE

The conceptual model shown in Figure 1 was drawn based on the literature review and uses the responsibilities checklist is intended to assist directors focus is on auditing outcome. IT supports the achievement of audit objectives, and IT risks are expressed as the impact they can have on the achievement of auditing objectives or strategy.

FIGURE 1 CONCEPTUAL MODEL

INFORMATION TECHNOLOGY RISK CAPABILITY ON THE AUDIT QUALITY OF THE CERTIFIED PUBLIC ACCOUNTANT IN THAILAND



Accounting Information Systems encompass numerous business applications, such as general ledger, payroll, supply chain management, manufacturing and business intelligence. Although very costly to implement such as ERP systems have been adopted by many companies in recent years due to the potential for lower operating costs, shorter cycle times, and higher customer satisfaction (Brown 1997). Successful adoptions of ERP systems have also been linked to enterprise-wide re-engineering efforts and implementation of best practices (Kumar, K. and J. Van Hillegersberg; 2000).

In particular, accounting information systems create substantial concerns about business interruption, system security, database security, and process interdependency risks (Girard and Farmer 1999). As will be discussed, several of these risks may result in greater control risks (e.g., lack of segregation of duties) and/or have a direct, material financial statement impact (e.g., invalid transactions, misclassifications, duplicate payments to vendors, and potential going concern issues relating to business interruptions) or require additional disclosures.

Auditors will find it necessary to understand fully the risks associated with new and advanced business information systems, and the controls that are needed to respond to those risks. Auditors also will find that they must expand their technological knowledge and skills, devise more effective audit approaches by taking advantage of technology, and design different types of audit tests to respond to new business processes. Highly skilled technology specialists will become even more essential members of audit engagement teams (Caralli, R.; J. Stevens; C. Wallen; D. White; W. Wilson; L. Young; 2007).

The interdependent nature of ERP system applications exposes a company to significantly different business and audit risks than traditional (legacy) computer systems. In particular, ERP systems pose substantial concerns about business interruption, system security, and process interdependency risks. Importantly, ERP systems represent more than enhanced information processing technology; they also automate interdependencies among business processes, and increase information security concerns, and often entail significant re-engineering efforts. Accordingly, the expanded scope of ERP systems can lead to heightened business risks and the potential for financial statement misstatements, misclassifications, and defalcations (Ernst & Young; 2008).

Consistent with strategic systems audit approaches, the Information Systems Audit and Control Foundation (1998) formulated the 'Control Objectives for Information and Related Technology' (COBIT) framework. COBIT follows a business orientation that begins with business objectives, which drives information systems strategy (e.g., planning and organization of information technology) and the subsequent evaluation of risks and controls over information processing. COBIT highlight the necessity for financial auditors to continually assess evolving business and audit risks arising from the infusion of new information technology into business organizations (ISACA; 2007, Libby, R. and J. Luft; 1993). Auditors' recognition of the unique risks posed by ERP systems is vital to the accomplishment of a global risk evaluation approach.

1. Information Technology Risk Capability, Rich Auditing Information Capability, Auditing Information Value and Audit Quality

Many financial services organizations are recognizing the need to broaden the scope of risk governance and management to include information technology. This awareness is growing in the wake of highly publicized identity theft incidents and other security breaches, as well as legislation aimed at better managing financial, market, and operational risk exposures.

An effective information technology risk management program is one that is designed to execute, manage, measure, control, and report on risk matters within information technology. If successful, an information technology risk management program provides the board of directors, senior management, regulators, and other stakeholders with the confidence that information technology can deliver business value efficiently and securely while providing high-quality assurance around data integrity, availability, and confidentiality(ISACA; 2008).

From a business perspective, the IT infrastructure plays an increasingly critical role in not only supporting and safeguarding a company's key assets and assuring proper governance and compliance, but also in driving business growth. Consequently, IT risk management is no longer viewed as a strictly technical function, but a crucial management task that can provide direct business benefits to the entire organization. The Risk IT framework complements ISACA's CobiT1, which provides a comprehensive framework for the control and governance of business-driven information-technology-based (IT-based) solutions and services. While CobiT sets good practices for the *means* of risk management by providing a set of controls to mitigate IT risk, Risk IT sets good practices for the *ends* by providing a framework for enterprises to identify, govern and manage IT risk(ISACA; 2007). IT risk can be categorized in different ways: IT benefit/value enablement risk associated with (missed) opportunities to use technology to improve efficiency or effectiveness of business processes, or as an enabler for new business initiatives; IT programmed and project delivery risk associated with the contribution of IT to new or improved business solutions, usually in the form of projects and programmes. This tie to investment portfolio management (as described in the Val IT framework) and IT operations and service delivery risk associated with all aspects of the performance of IT systems and services, which can bring destruction or reduction of value to the enterprise. IT risk is business risk specifically, the business risk associated with the use, ownership, operation, involvement, influence and adoption of IT within an enterprise. It consists of IT-related events that could potentially impact the business (Protivit; 2008). It can occur with both uncertain frequency and magnitude, and it creates challenges in meeting strategic goals and objectives.

Information Technology Risk Capability

The Risk IT framework is to be used to help implement IT governance, and enterprises that have adopted (or are planning to adopt) CobiT as their IT governance framework can use Risk IT to enhance risk management. The CobiT processes manage all IT-related activities within the enterprise. These processes have to deal with events internal or external to the enterprise. Internal events can include operational IT incidents, project failures, full (IT) strategy switches and mergers. External events can include changes in market conditions, new competitors, new technology becoming available and new regulations affecting IT. These events all pose a risk and/or opportunity and need to be assessed and responses developed. The risk dimension, and how to manage it, is the main subject of the Risk IT framework. When opportunities for IT-enabled business change are identified, the Val IT framework best describes how to progress and maximize the return on investment (ISACA; 2007).

IT risk is a component of the overall risk universe of the enterprise. Other risks an enterprise faces include strategic risk, environmental risk, market risk, credit risk, operational risk and compliance risk. In many enterprises, IT-related risk is considered to be a component of operational risk, e.g., in the financial industry in the Basel II framework. However, even strategic risk can have an IT component to it, especially where IT is the key enabler of new business initiatives. The same applies for credit risk, where poor IT (security) can lead to lower credit ratings. IT risk is business risk specifically, the business risk associated with the use, ownership, operation, involvement, influence and adoption of IT within an enterprise. It consists of IT-related events and conditions that could potentially impact the business. It can occur with both uncertain frequency and magnitude, and it creates challenges in meeting strategic goals and objectives (Lilly, R. S.; 1997).

The risk management process model groups key activities into a number of processes. These processes are grouped into three domains. The process model will appear familiar to users of CobiT and Val IT: substantial guidance is provided on the key activities within each process, Responsibilities for the process, information flows between processes and performance management of the process. The three domains of the Risk IT framework include Risk Governance, Risk Evaluation and Risk Response. (ISACA; 2007, Westerman; 2007)

Risk Governance was ensuring that IT risk management practices are embedded in the enterprise, enabling it to secure optimal risk adjusts return.

Risk Evaluation was ensuring that IT risks and opportunities are identified analyzes and presented in business terms.

Risk Response was ensuring that IT- related risk issues, opportunities and events are addressed in a cost-effective manner and in line with business priorities.

Auditors conduct the evaluation to provide assurance to the audit committee and senior management as to the state of risk and control systems and, in the case of legislation such as the Sarbanes-Oxley Act, the reliability of management's representation concerning the state of controls. Today, proliferation of information systems in the business environment gives auditors easier access to more relevant information but also involves the management and review of vastly increased volumes of data and transactions (Ernst & Young; 2007).

Information Technology Risk Capability and Rich Auditing Information Capability

Continuous auditing helps auditors to evaluate the adequacy of management's monitoring function. Auditing also identifies and assesses areas of risk, and provides information to auditors that can be communicated to management to support its efforts to mitigate the risk. Additionally, it can be used when developing the annual audit plan by focusing audit attention and resources on areas of higher risk. This improves the organization's management and control frameworks and provides mechanisms that auditors can use to support their own independent review and assessment activities. Increased ability to mitigate risks; reductions in the cost of assessing internal controls; increased confidence in financial results; improvements to financial operations and reductions in financial errors and the potential for fraud (Rasmussen, M.; 2006).

Information Technology Risk Capability and Auditing Information Value

Auditors can to the effectiveness of the control environment and the accuracy of the information contained in financial reports are enacted, chief executive officers and chief financial officers are turning to the internal audit activity to assist in complying with these regulations. The use of technologies that support continuous control assessment can assist auditors in examining detailed transactions, as well as summarized data, to identify anomalies and other indictors of fraud, waste, and abuse. For example, leveraging data analysis technologies auditors can easily identify instances where contracting authority was exceeded. Auditors should consider incorporating into the standard auditor report a clear statement of responsibilities for reviewing and/or reporting on companies' risk management and corporate governance arrangements (PricewaterhouseCoopers; 2007). Therefore, posit the hypotheses as below:

H1: Information Technology Risk Capability is positively associated with the Audit Quality

H2 Information Technology Risk Capability is positively associated with the Rich Auditing Information Capability

H3: Information Technology Risk Capability is positively associated with the Auditing Information Value

2. Rich Auditing Information Capability Auditing Information Value and Audit Quality

Auditors, by doing audits in accordance with the generally accepted auditing standards (GAAS), will attest to the fairness of corporate financial reports by detecting and reporting material deviations from the generally accepted accounting standards to various stakeholders (Lin and et al, 2009). The usefulness of accounting information can effect on the decision making of users. So, in order to increase the usefulness of accounting information, auditors add the assurance of financial information which it can results to increase the value relevance. Hence, when audit report has value relevance, it can improve decisions of users about rational investment, credit, and etc. The relationship between audit quality and value relevance of accounting information is explored by Lee and Lee (2011). They survey the effect of a firm's future profitability on its book value, when estimating the explanatory power of book value to stock return. The results show that when the big-five of audit firm audited the earnings and book value, it explains more variations in stock return than those audited by other firms. Hence, the value relevance of earnings and book value for firms which audited by the big-five of audit firms are more than other firms. Therefore, posit the hypotheses as below:

H5: Rich Auditing Information Capability is positively associated with the Audit Quality

H6: Auditing Information Value is positively associated with the Audit Quality

3. RESEARCH METHODS

3.1 Sample Selection

The sample data for this study comprise CPAs' in Thailand form Federation of Accounting Professionals under the Royal Patronage of His Majesty the King. The sources of data are good sources because research method provides a sampling framework that possibility sampling and it can assume that CPAs' in Thailand are members of Federation of Accounting Professionals under the Royal Patronage of His Majesty the King. The simple random of CPAs' in Thailand from Federation of Accounting Professionals under the Royal Patronage of His Majesty the King was 1,800 participants who had passed examination subject of the Computerized Auditing. Deducting the undeliverable from the original 1,800 mailed, the valid mailing was 34 surveys from which 412 responses were received. Of the surveys completed and returned, only 386 were usable. The effective response rate was approximately 21.55%. According to Aaker, Kumar and Day (2001), the response rate for a mail survey, without an appropriate follow-up procedure, is less than 20%. Thus, the response rate of this study is considered acceptable. Following Armstrong and Overton (1977) tested for differences between early and late respondents and found no significant differences, indicating that non response bias was not a major problem in this study.

3.2 Questionnaire Design and Measurements

3.2.1 Questionnaire Design

The design of the questionnaire of this study is adopted several from sources of data, including previous instruments developed by other researchers and the research framework developed from the relevant literature. Most of the questions were in closed form using a Likert-type scale, all scored on five-point numerical scale from 1=strongly disagree to 5=strongly agree. A half page empty space at the end of the questionnaire is provided to give respondents an opportunity to express anything else that they would like to add. Before using the data collected, the pre-testing was undertaken (Hunt et al., 1982, Presser & Blair, 1994, Babbie, 2005). Pre testing was intended to identify whether there were any ambiguous or unanswerable questions, to identify whether the wording or layout could be adjusted, whether the meaning the researcher believed was associated with a question, and how others perceived it. A draft of the questionnaire was sent to academics at University of Mahasarakham to examine and approve the construct validity. Academics are served as respondents and assist in testing the instrument; comments and suggestions were use to revise the instrument in terms of readability, validity.

3.2.2 Measurements

The design of the questionnaire of this study is newly developed from several sources of data, including previous instruments developed by other researchers and the research framework developed from the relevant literature.

All of the questions are in closed form using a Likert-type scale. All are scored on five-point numerical scale from 1=strongly disagree to 5=strongly agree. The measurement analysis emphasizes explanation of the reliability and validity of new instruments for measuring these constructs.

3.2.2.1 Dependent Variables

Audit Quality measured via 6 items that the auditing operational efficiency, audit cost savings, reduction of human errors and it offers a means for increasing productivity and management, control of data; the management and control of the transactions processed; and the management and control of the auditing information produced

3.2.2.2 Independent Variables

Information Technology Risk Capability was measured using 9 items to test the business risk associated with the use, ownership, operation, involvement, influence and adoption of IT within an enterprise include Risk Governance (integrate with ERM, establish and maintain a common risk view, make risk aware business decision); Risk Evaluation (analyze risk, collect data, maintain risk profile) and Risk Response (manage risk, articulate risk, react to events)

Rich Auditing Information Capability measured via 6 items includes identifies and assesses areas of risk, and provides information to auditors; internal controls; increased confidence in financial results; improvements to financial operations and Reductions in financial errors and the potential for fraud.

Auditing Information Value was measured using 6 items to test the Integrity, accuracy and currency of information, to produce high quality information

3.3 Validity and Reliability

An assessment of the reliability of the constructs and the validity of the instrument were conducted to establish the reliability and validity of the instrument.

Reliability; the most common measure of scale reliability is Cronbach's Alpha. Prior to conducting factor analysis on the data, it was considered useful to check the reliability of the scale used to confirm that the scale used consistently reflects the scale they are measuring (Field, 2005).

Validity; to identify any remaining issues the test instruments pre-testing was undertaken (Hunt et al., 1982, Presser & Blair, 1994, Babbie, 2005). Pre testing was intended to identify whether there were any ambiguous or unanswerable questions, to identify whether the wording or layout could be improved, whether the meaning the researcher believed was associated with a question was how others perceived it.

Factor analysis was firstly utilized to investigate the underlying relationships of a large number of items and to determine whether they can be reduced to a smaller set of factors. The factor analyses conducted were done separately on each set of the items representing a particular scale due to limited observations. With respect to the confirmatory factor analysis, this analysis has a high potential to inflate the component loadings. Thus, a higher rule-of-thumb, a cut-off value of 0.40 was adopted (Nunnally and Berstein, 1994). All factor loadings are greater than the 0.40 cut-off and are statistically significant. The reliability of the measurements was evaluated by Cronbach alpha coefficients. In the scale reliability, Cronbach alpha coefficients are greater than 0.70 (Nunnally and Berstein, 1994). The scales of all measures appear to produce internally consistent results; thus, these measures are deemed appropriate for further analysis because they express an accepted validity and reliability in this study. Table 1 shows the results for both factor loadings and Cronbach alpha for multiple-item scales used in this study.

TABLE 1
RESULTS OF MEASURE VALIDATION

Items	Factor Loadings	Cronbach Alpha
Audit Quality	0.80 – 0.82	0.85
Information Technology Risk Capability	0.83 – 0.85	0.87
Rich Auditing Information Capability	0.85 – 0.88	0.88
Auditing Information Value	0.81 – 0.85	0.83

3.4 Statistic Test

This research uses the Ordinary Least Squares (OLS) regression analysis to test the hypotheses and estimate factors affecting audit performance. Because both dependent and independent variables in this study were neither nominal data nor categorical data, OLS is an appropriate method for examining the hypotheses relationships (Aulakh, Kotabe and Teegen, 2000). In this research, the model of aforementioned relationships is as follows:

Equation 1: ITRC $= ß_{01} + ß_1AQ + e$
Equation 2: ITRC $= ß01 + ß_2AIC + ß_3AIV + e$
Equation 2: RAIC $= ß_{02} + ß_5AP + e$
Equation 3: AIV $= ß_{03} + ß_8AP + e$

Where as:
AP = Audit Quality; ITRC = Information Technology Risk Capability; RAIC = Rich Auditing Information Capability; AIV = Auditing Information Value

4. RESULTS AND DISCUSSION

The descriptive statistics and correlation matrix for all variables are shown in Table 2. The results of OLS regression according to hypotheses are estimated as shown in Tables 3.

Table 2 shows the descriptive statistics and correlation matrix for all variables. With respect to potential problems relating to multicollinearity, variance inflation factors (VIF) were used to provide information on the extent to which non-orthogonality among independent variables inflates standard errors. The VIFs range from 1.01 to 2.15, well below the cut-off value of 10 recommended by Neter, Wasserman and Kutner (1985), meaning that the independent variables are not correlated with each other. Therefore, there are no substantial multicollinearity problems encountered in this study.

TABLE 2
DESCRIPTRIVE STATISTICS AND CORELATION MATRIX

Variables	AQ	ITRC	RAIC	AIV
Mean	3.82	3.76	3. 72	3.84
Audit Quality				
Information Technology Risk Capability	0.62**			
Rich Auditing Information Capability	0.68**	0.66**	0.70**	
Auditing Information Value	0.70**	0.68**	0.70**	0.72**

* p<.05, ** p<.01

Table 3 presents the results of OLS regression of the relationship between the Information Technology Risk Capability on Audit Quality via Auditing Information Capability and Auditing Information Value.

The first set of research hypothesis focused on the relationships between the Information Technology Risk Capability and Rich Auditing Information Capability; Auditing Information Value. Audit Quality (Hypotheses 1-3) are shown in Table 3. The evidence indicates that the Information Technology Risk Capability (H1: $b_1 = 0.62$, $p < 0.01$) has a positive and significant effect on Audit Quality. Therefore, Hypothesis 1 is supported.

The Information Technology Risk Capability (H2: $b_2 = 0.66$, $p < 0.01$) has a positive and significant effect on the Rich Auditing Information Capability. Therefore, Hypothesis 2 is supported.

The Information Technology Risk Capability (H6: $b_3 = 0.64$, $p < 0.01$) has a positive and significant effect on the Auditing Information Value. Therefore, Hypothesis 3 is supported.

The second set of the hypotheses concentrated on the relationships between the Rich Auditing Information Capability; Auditing Information Value and Audit Quality (Hypotheses 4-5) in Table 3. The evidence indicates that the Rich Auditing Information Capability (H4: b_4= 0.65, $p < 0.01$) has a positive and significant effect on the Audit Quality. Therefore, Hypothesis 4 is supported.

The Auditing Information Value (H5: b_5= 0.67, $p < 0.01$) has a positive and significant effect on the Audit Quality. Therefore, Hypothesis 5 is supported.

TABLE 3
RESULTS OF OLS REGRESSION ANALYSYS[a]

Independent variables	Dependent Variable			
	AQ	AIC	AIV	AQ
Information Technology Risk Capability	0.62*** (0.04)	0.66*** (0.08)	0.64*** (0.06)	
Rich Auditing Information Capability				0.65*** (0.06)
Auditing Information Value				0.67*** (0.05)
Adjusted R2	**0.65**	**0.67**	**0.64**	**0.66**

*** p<.01, a Beta coefficients with standard errors in parenthesis.

5. CONTRIBUTIONS

5.1 Theoretical Contributions

The research contributes to the extension of the direct effects of IT governance; i.e., value delivery and strategic alignment, risk management, resource management, and performance measurement, on the usefulness of accounting information presented in the financial statements. The outcome of the research provides an accurate view of significant current and near-future IT-related risks throughout the extended enterprise, and the success with which the enterprise is addressing them End-to-end guidance on how to manage IT-related risks, beyond both purely technical control measures and security; Understanding how to capitalize on an investment made in an IT internal control system already in place to manage IT-related risk; Understanding how effective IT risk management enables business process efficiency, improves quality, and reduces waste and costs and the common framework/language to help communication and understanding amongst business, IT, risk and audit management

5.2 Practical Implications

The Risk IT framework explains IT risk and enables users to: Integrate the management of IT risk into the overall ERM of the enterprise, thus allowing the enterprise to make risk-return-aware decisions; Make well-informed decisions about the extent of the risk, and the risk appetite and the risk tolerance of the enterprise and understand how to respond to the risk include 1) Improving the risk assessment process ; 2) Enhancing the ability to monitor emerging risks ;3) Becoming more relevant to achieving the organization's business objectives ;4) Reducing overall internal audit function costs without compromising risk coverage and 5) Identifying opportunities for cost savings in our business

6. CONCLUSION

In this study, the model to investigate the direct effects of IT risk for uses Management on the usefulness IT supports the achievement of audit objectives, and IT risks are expressed as the impact they can have on the achievement of auditing objectives or strategy. The results can used to describe information technology risk management functions trying to strike a balance between strategic and tactical risk initiatives. Some have addressed their program designs and operating models (roles within the organizational structure, responsibilities, and accountability), defined a consistent process-risk-control framework or model, and focused on improvements in the workflow, efficiencies, and effectiveness of their information technology risk management processes.

7. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study emphasizes the importance of the information technology risk management and links audit quality, but it does not address the issue of how the Data Mining Technology Efficiency should be carried out. This research has some limitations. This study emphasizes the importance of the information technology risk management and Rich Auditing Information Capability; Auditing Information Value the Process of Audits. Future research could identify the antecedents of the information technology risk management in context of Thailand.

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