IMPACT OF ACCOUNTING INFORMATION SYSTEMS AND INTERNAL CONTROL

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Abstract

In the response of several financial scandals and corporation collapses, corporate governance, particularly internal control, comes to an attention of public. This research findings show that with effective internal control within the organizational boundary, management has reasonable assurance that it can enable businesses to achieve the objectives in accordance with compliance. It can be said that proper designed and functioning internal control mechanism can reduce the likelihood errors or fraud and hence organizations would perform as expected. Moreover, AIS provides financial information that is essential to monitor and manage organizational resources together with conventional accounting controls. Furthermore AIS provide reasonable assurance regarding the reliability of financial reporting, and the preparation of financial statement in accordance with international financial reporting standards. This study has built the internal control framework as the organization boundary in order to facilitate organization to design effective internal control. Moreover, this study found association between the impacts of AIS on the effectiveness of internal control.

1. Introduction

Corporate governance has been in attention of public for many decades due to its importance for economic development and society. In fact corporate governance has been addressed interestingly by Shleifer and Vishny (1997, p 737) that "corporate governance which deals with the way in which suppliers of finance to corporations assure themselves of getting a return on their investment". However, it is difficult to write such perfect contract which can specify all possible future decisions on how the firm's resources and assets will be allocated by managers effectively. That means there is no guarantee that managers will run the firms in the best interest of the shareholders. This situation will makes it difficult for shareholders to ensure that their funds are appropriately managed in attractive or even profitable projects which will bring appropriate return to them (Fama and Jensen, 1983). Corporate governance has attracted a good deal of public again in the response of several collapse of large size entities such as Enron and WorldCom. The US government issued the Sarbanes-Oxley Act (SOX) in 2002. In particular, section 404 of SOX requires the public companies to report the effectiveness of their internal control systems and required auditors to verify management's reports. McKay (2006) suggests that manger is responsible for the design, implementation, and monitoring of internal controls. It can be seen that internal control is an important factor that protect the entity from fraud, waste, abuse, and misstatements in the financial statements. Effective internal control must be carefully designed, thoroughly documented, appropriated implemented, and regularly monitored (Ge and McVay, 2005; Hermanson 2005; Janvrin, 2008). In fact, internal control is heavily enhanced by information systems in particular XBRL GL[1] standard. The systems can be integrated to safeguard assets by maintaining electronic approvals of business transactions which can be audited automatically. This can enable users avoid fraud by allowing internal auditors to check standardized rules and operate audit test. Brizarro and Garcia (2011) address that XBRL GL can be used to maintain accurate information as well as aid in manual audits by storing information regarding the location of source documents whether they are in electronic form or paper form. Jones and Rama (2005) suggest that Accounting Information System (AIS) provides controlling functions that necessary to monitor and manage organizational resources together with conventional accounting controls: inputs, process and outputs. AIS is still growing continuously also it plays an important role in most corporations in facilitating day-to-day business operations as well as in gaining competitive advantages. AIS uses modern Information Technology (IT) to perform more business functions from the input devices to sophisticated financial management planning and processing systems or Enterprise Resource Planning or ERP (Turban et al, 2011).

As SOX Act mandates a statement of management's responsibility to establish and maintain adequate internal controls over financial reporting (COSO, 1992; Gauthier, 2006). Management is expected to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statement in accordance with international financial reporting standards (Hermanson, 2005; Gauthier, 2006; McKay, 2006). Managers need to understand how these technologies emerge to protect the integrity of enterprise systems. The impact of AIS on the effectiveness of internal control has become a critical concern amongst academics, directors, accountants, auditors and related persons. Not many studies have examine the internal control and AIS Therefore, this study will investigate issues associated with effectiveness of internal control and AIS and will develop the framework of AIS and effectiveness of internal control. In particular, this study will firstly, review key debates in the field of study. Secondly, methods of analysis and synthesis are used to synthesize interconnections of the impact of the AIS on effectiveness of internal controls over financial

[1] XBRL International's Global Ledger Taxonomy Framework.

reporting and then formulated regularities for research findings. Conclusion of research findings will be conducted in the final section.

2. Literature Review

This section attempts to lead to an understating of internal control which includes control environment, process of risk assessment, control activities, information and communication and monitoring.

2.1 Understanding Internal Control

Committee of Sponsoring Organizations of the Treadway Commission or COSO (1992) suggests that internal control can provide reasonable assurance that management achieves effectiveness and efficiency of operation, produce reliability of financial reporting, and compliance with applicable laws and regulations. Effective internal control is considered as one of several factors that significantly importance to quality of financial reporting. Quality of financial reporting is an essential factor to fulfill the firm obligation to its investors who must rely of the financial information reports (Public Company Accounting Oversight Board or PCAOB, 2004). Auditing Standards No. 2 (PCAOB, 2004, para 7. AS no. 2) defines internal control over financial reporting that as "a process designed by…, the company's principal executive and effected by the company's board of directors, management, and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures…". Generally, it can be said that effective internal control can reduce the likelihood of significant errors or fraud (Doyle et al., 2007). Internal control has five essential elements framework including control environment, risk assessment, control activities, information and communication and monitoring.

2.1.1. Control Environment

COSO (1992) states that control environment can set the condition of an entity as it influences the control of people's consciousness in the organization. The sound control environment depends on management's informed and the support from management. Therefore, it is essential that the management must understand the environment of the organization in order to design the effective internal control. High quality control environment enable firms to access causes of financial misstatements as to control activity. The reason is high quality control environment is designed appropriated and put in the place that can reduce the risk of errors (Ashbaugh-Kaife et al., 2008; McNally, 2014).

2.1.2. Process of Risk Assessment

Every company has to face a variety of risks from both external and internal sources. Business risk includes the ability to survive of businesses in terms of financial situation, public image as well as overall quality of product and/or services (COSO, 1992). This is the reason that the companies are required to do risk assessment. The purpose of risk assessment is to identify the events, conditions or risks that can significantly affect the achievement of the efficient business's operation. Morris (2011) states that internal control is one of several factors that can reduce the agency problem. Moreover, Gauthier (2006) suggests that risk is a factor that changes all the time and the factors that cause risk changes are the changes in operating environment, the changes of information systems and technology, for instance.

2.1.3. Control Activities

Control activities are the procedures designed by management to ensure that the organization's objectives are not affected by both internal and external risks (Mihaela and Iulian, 2012). Control activities are identified as several activities, for instance, approvals, authorizations, verifications, reconciliations and reviews of operating performance, security of assets and segregation of duties. Though most of organizations have other extra controls activities but it will increase the confidence of stakeholders (COSO, 1994). Manager needs to ensure that control activities are implemented and applied in order to comply with relevant legal and regulatory requirements (Schneider and Church, 2008).

2.1.4. Information and Communication

Good communication is an essential part of good policy making and risk assessment. It is common that organizations must have a sound communication process which will allow information to flow around the organization. Moreover, information needs to be allowed to flow back up to those who are responsible for making corrections in order to weaken the chance of misunderstanding (Gauthier, 2006). In particular, information must be identified captured and communicated in a form and timeframe that enables user to carry out their responsibilities. (Bagranoff et al., 2005).

2.1.5. Monitoring

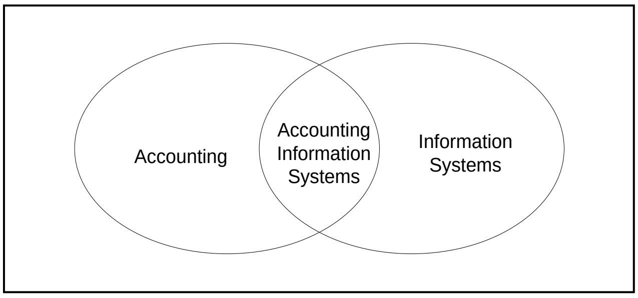
Monitoring determines whether policies and procedures designed and implemented by management are being conducted effectively by employee (COSO, 1992). Monitoring consists of three elements. Firstly, a risk register which contains outputs of the business processes including identified internal and external risks, risk response, trigger, and warning signs of risk. Secondly, an approved change request which includes changes of existing plan and method of work. The change request may require new risk and new corresponding responses. Thirdly, a risk register-update which includes outcomes of risk assessment, audits, corrective actions and recommended preventive action (Glover et al., 1995). Ashbaugh-Skaife et al. (2008) suggest that misappropriate of company's assets can be caused by ineffective internal control. Most of the time, ineffective internal control cannot be detected unless the company has a strong monitoring system. Lu et al. (2011) suggest that existing of monitoring can ensure that significant control deficiencies are identified timely. In addition, efficiency monitoring can help to identify the new risk or any changes and need for new control procedures.

2.2 Understanding Accounting Information Systems

After recognizing the internal control mechanism, this research carried out the impact to the way corporation prepares their financial statements. And that SOX Act's primary objective is to improve the accuracy as well as reliability of corporate disclosures. Specifically, under SOX section 404, refers to management assessment of internal controls that related to the preparation of financial statement for external purposes that must be fairly presented in conformity with GAAP and IFRS (Nickolett, 2005). Recent years, IT has become increasingly important as most corporations embrace information technology (IT) to facilitate their business operations. Also all businesses must involve with accounting and hence accounting information systems (Nickolett, 2005). Managers have to ensure that the existing information systems and procedures for financial reporting are effectively maintained along with an assessment of the company's internal control structure (Hunton et al., 2006 and Ashbaugh-Skaife et al. 2008).

Accounting Information System (AIS) are computerized systems that transform financial and other related data into useful (Bodnar and Hopwood, 2010; Bagranoff et al., 2007; Beard and Wen, 2007; Gelinas and Dull, 2008; Sajady, 2008). AIS exists at the intersection of two important disciplines which are accounting and information system (see Figure 1).

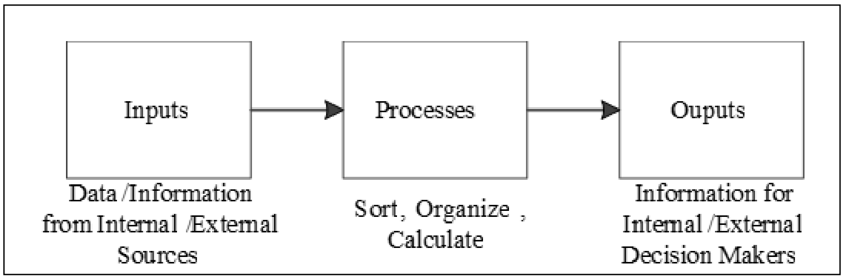
Figure 1 **Accounting Information Systems**



(Source: Bagranoff et al., 2005, p.5)

From Figure 1, in accounting field, it includes take perform by AIS to create information for accounting process such as accounts receivable and accounting payable. AIS performs integrated tasks for instance maintain general ledger, financial planning. Information System refers to computer system that involve with collect accounting data, store it, and process it for end users (Boockholdt, 1999; Kulruchakorn, 2007; Hurt, 2008). Bonsón at al. (2009) suggests that facilitates the rapid sharing of information in an organization's information system from several information sources. AIS is a vital factor to generate information needs for operation processes, managerial reports, budgeting and control within organization to gain competitive advantages and maintain sustainable development in growing hostile business environment (Spathis and Constantin, 2004; Soudani, 2012). With achieving this expectation, the companies still need to concern on maintain privacy and security of their company's information assets (Li et al., 2007). Sonde (2008) suggests that several accounting and finance systems have not met expectations of many organizations because information is not easily accessible. Moreover, the changes effected by SOX Act 2002 requires board of directors, management and other personnel to provide reasonable assurance in the efficient and effective operations, reliable reporting and compliance with applicable laws and regulations ever make it more challenging use of computerized systems in accounting. In producing such quality accounting information, managers need to pay attention to internal control. In particular, AIS uses modern Information Technology (IT) with traditional accounting controls: input, process, and output (See Figure 2)

Figure 2 **AIS Components**



(Source: Bagranoff et al. 2005, p.7)

From Figure 2, the inputs include standardized data entry, Electronic Data Interchange (EDI[2]), and electronic commerce (e-commerce) via the Web enabled technology (Bierstaker at al., 2001; Bagranoff et al., 2005). EDI can be a set of interchanges between two parties: a buyer and a seller in general retail business. Messages from the buyer to the seller will include request for quotation (RFQ), purchase order, receiving and payment instructions. Messages from seller to buyer could include bid in response to RFQ, purchase order acknowledge, shipping notice and invoice. These messages may simply provide data of receiving instruction or purchase order. By using EDI, the processing of message is processed by computer as such it eliminating costly and error-prone paper works because human intervention. Bonsón at al. (2009) suggest that business needs to obtain detailed and specified data, and quickly to process it and still maintain its accuracy. Therefore, XBRL[3] is introduced as it can solve the inconsistency problem by describing financial information in the standardized format for public and private companies and other organizations. Hurt (2008, p.307) suggest that the XBRL taxonomies define the tags that present accounting and financial terms used in XBRL documents and it is widely adapted for Generally Accepted Accounting Principles (GAAP). IASCF (2008) addresses that little evidence of existing use of XBRL for reporting by listed companies even though XBRL had been promoted as a tool for financial reporting. The reason for the lack of use of XBRL reports are incapable accounting software and information systems, and difficult in exploiting XBRL outputs according to international and local GAAP.

3. Objective

This study aims to build the internal control framework as the organization boundary in order to facilitate organization to design effective internal control. In addition, operators' perspective on AIS related to the internal control is examined in this study.

4. Methodology

The study use secondary data to develop the framework of AIS and internal control. The survey study is also included in this study to examine the impact of AIS on internal control by using Likert's scale. This study attempts do the survey by using sample of employees from one educational institution in Chiang Mai in accounting and finance and accounting department and internal control department. There are 10 out of 12 employees from finance and accounting department and 1 out of 3 from internal control department response to the survey.

This research uses Likert's Scale method by divided the level of measurement into 5 levels according to Likert's Scale. The five levels is shown as follows:

Level	**Scores**
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

[2] EDI is the direct computer-to-computer exchange of data via a communications network (Bierstaker at al, 2001; Bagranoff et al., 2005).

[3] XBRL (eXtensible Business Representation Language) is a language for the electronic communication for business and financial data based on XBRL taxonomies (Bonsón at al.,2009)

Likert's Scale width interval class is calculated as follow

$$\text{Width interval class} = \frac{(\text{Maximum score - Minimum score})}{\text{Number of interval class}}$$

$$= \frac{(5 - 1)}{5} = 0.8$$

Average score for each level

Scores	Level
$4.21 \leq \bar{x} \leq 5.00$	Strongly agree
$3.41 \leq \bar{x} \leq 4.20$	Agree
$2.61 \leq \bar{x} \leq 3.40$	Undecided
$1.81 \leq \bar{x} \leq 2.60$	Disagree
$1.00 \leq \bar{x} \leq 1.80$	Strongly disagree

$$\bar{x} = \frac{X_1W_1 + X_2W2 + X_3W_3 \ldots X_nW_n}{N}$$

$\bar{x}$ = average score of level of consumers percept on e-banking
$X_1, X_2, X_3 ... X_n$ = score of each interval level
$W_1, W_2, W_3 ... W_n$ = Number of respondents response to each level of interval level
N = Number of respondents to questionnaires

5. Result

5.1 Framework Development AIS and Internal Control

This study investigates the impact of AIS on the effectiveness of internal control and the conceptual framework of AIS will be developed. This section will firstly discussed on the impact of AIS on internal control in two areas. Secondly, it will discuss on the conceptual framework development which included adapted information from COSO, internal control-integrated framework, SOX and other related search findings.

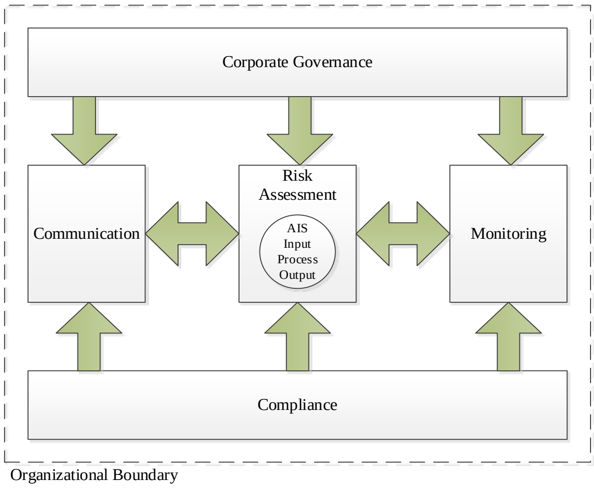
1) Impact of AIS on Internal Control

This study attempts to examine the impact of AIS and on the effectiveness of the internal control. From the literature, it can be firstly seen that most corporations do not adequately restrict access to accounting and financial data to only those computer support staff. When a corporations do not adequately monitor the activities of thousands of employees who are authorized to access accounting files, the organizations do not have reasonable assurance in its outcomes. In this case, the data might be manipulated to generate unauthorized access or changes might be made to AIS. As a result, essential operations could not be continued due to above unexpected interruptions. Secondly, as businesses' operation vary according to their owned operations, in particular, the internal control is treated according to established rules that depend on the structure of the businesses which constitutes them for the purpose of accounting and reporting. Imperfection of internal control is associated with the severity of the international control weaknesses, and poor quality of financial reporting and statements (Kinney, 2000).

2) Framework Development

This study has developed conceptual internal control framework which can be considered in three approaches (see Figure 3). Firstly, an upstream approach provides roles of management which is focused on troll of governance influence on communication, risk assessment, and monitoring. Secondly, a downstream approach illustrates reasonable compliance in the effective operations that provides accurate, visible and timely accounting information. Finally, the organization boundary approach illustrates limits of the people and information involved in the internal control.

Figure 3 **Internal control framework**



This study also illustrates the internal framework in six elements which include governance, communication, risk assessment, monitoring, compliance and organizational boundary.

1. Corporate governance

A role of corporate governance is related to accountability that embraces the need to ensure the quality of the businesses' operations. It is naïve to assume that accountability in the process of disclosing relevant information or known as transparency to the public in particular shareholders. In this study's framework, information disclosure and transparency are understood as a mechanism of accountability. That means information disclosure as a mechanism of visibility, and transparency as the degree of information accessibility to the public. In this regard, it has been suggested that good corporate governance and its mechanisms can ease accountability problems.

2. Communication

This study suggests that a role of communication is to capture, process, and provide information to all stakeholders who have need of it. A communication system must allow information to flow in and out of all directions within the organization to weaken the chance of misunderstanding. In addition, quality information must be identified, captured and communicated in a form and timeframe that enables people to carry out their responsibilities.

3. Risk Assessment

Risk assessment plays an importance role identifying the events, conditions or risks that could significantly affect the achievement of the efficient operation of AIS, and other activities of a business. Risk assessment should begin from the top of the organization and reach down to the department level. The events of authorization may involve limiting access authorizations. It may include reviewing these authorization for individual employee to only perform their duties and ensure their authorizations. It may include reviewing these authorizations periodically. Moreover, there should be established procedures for reviewing the access activities of employees. Any modification requests of AIS should only be considered via independent quality assurance review. To enhance system and data integrity, AIS must meet requirement with regards to the security, reliability, availability and relevance of accounting and financial information.

4. Monitoring

Monitoring is an essential factor to determine whether or not policies and procedures designed and implemented by management are being conducted effectively in its organizational compliance. For this purpose, management must ensure that significant control deficiencies are identified timely and help to identify the new risks or any changes as well as the need for new control procedures. Moreover, the managers must ensure that an internal control system is designed to provide adequate quality assurance of the efficient use of organizational resources in order to maintain the accuracy of information. In particular, an appropriate process is established to meet the reliability requirements for published accounting and financial information.

5. Compliance

A role of compliance is to comply with the policies and procedures which ensure that the organization's objectives and goals are not negatively affect by both internal and external risk. Regulatory agencies may interest in timely, accurate, and complete disclosure of information designed to maintain orderly and fair market.

6. Organizational Boundaries

Organizational boundaries is to determine the legitimate of illegitimate, the acceptable or unacceptable, the controllable or uncontrollable to address certain functional prerequisites within the internal environment, and to interact with their external environment. The organizational boundary approach is to provide limits of the people and information involved in the internal control.

5.2 Impact of AIS on internal control

This study conducts the survey and the results in Table 1 show that AIS plays important roles in entities' operations and helps transactions to be recorded father than manual. In additional, the results show that AIS provides control environment as it allows only authorized person to access information and keeps the record of document sent-out. In addition, AIS can reduce errors in recording transactions and that would make financial reports are more reliable. AIS also can keep information confidential and it makes transferring information faster and secured. In adopting AIS, it helps operating of task more transparent as it can clarify the duty segregation and therefore increase control of environment. However, AIS still cannot reduce the risk of fraud.

	AIS and Internal Control		Strongly Agree 5	Agree 4	Un-Decided 3	Dis-Agree 2	Strongly Disagree 1	Total	$\bar{x}$
1	AIS has important roles in entities' operations	Number	8	3				11	4.73
		(%)	73	27				100	Strongly Agree
2	AIS helps recording transactions faster than manual	Number	5	4	2			11	4.27
		(%)	45	36	18			100	Strongly Agree
3	AIS can reduce errors in recording transactions	Number	2	4	2	3		11	3.45
		(%)	18	36	18	27		100	Agree
4	AIS makes financial reports more reliable	Number	1	3	7			11	3.45
		(%)	9	27	64			100	Agree
5	AIS keeps information confidential	Number	1	6	3		1	11	3.55
		(%)	9	55	27			91	Agree
6	AIS allows only authorized person to access information	Number	5	5	1			11	4.36
		(%)	45	45	9			100	Strongly Agree
7	AIS keeps the records of documents sent-out	Number	4	6	1			11	4.27
		(%)	36	55	9			100	Strongly Agree
8	AIS can transfer information faster and secured.	Number	1	8	1	1		11	3.82
		(%)	9	73	9	9		100	Agree
9	AIS reduces a likelihood of risk in fraud	Number	2	4	1	4		11	3.36
		(%)	18	36	9	36		100	Undecided
10	AIS helps operating of task transparent	Number	3	1	5	2		11	3.45
		(%)	27	9	45	18		100	Agree
11	AIS increases control environment	Number	1	6	1	3		11	3.45
		(%)	9	55	9	27		100	Agree
12	AIS helps to clarify duty segregation	Number	3	7		1		11	4.09
		(%)	27	64		9		100	Agree

Conclusion

This research investigated issues of association between the impacts of AIS on the effectiveness of internal control. This study suggests that AIS as a risk assessment component, the related components of the traditional accounting control are working together for the purpose of governance, communication, monitoring, and compliance within organizational boundary. The effectiveness of internal control can provide quality information to decision makers to manage corporations successfully. The usefulness of AIS leverages business strategies are in the way of increasing the organizational performance, the achievement stronger and more flexible decision making processing. The main impact of AIS on the effective internal control concerns the usefulness of AIS with organizational requirements for collecting, entering, and processing data and storing, managing, controlling and reporting information so that the corporations can achieve its objectives. In addition, this study confirms that an optional use of AIS in an organization leads to better adaption to a changing business control environment which make financial statement more reliable. As a result the effective of decision making, a high degree of competiveness, and improve external relationships for the corporations can be achieved.

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