

The Adoption of Process Management for Accounting Information Systems in Thailand

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Abstract—Information Quality (IQ) has become a critical, strategic issue in Accounting Information Systems (AIS) adoption. In order to implement AIS adoption successfully, it is important to consider the quality of information use throughout the adoption process, which seriously impacts the effectiveness of AIS adoption practice and the optimisation of AIS adoption decisions. There is a growing need for research to provide insights into issues and solutions related to IQ in AIS adoption. The need for an integrated approach to improve IQ in AIS adoption, as well as the unique characteristics of accounting data, demands an AIS adoption specific IQ framework. This research aims to explore ways of managing information quality and AIS adoption to investigate the relationship between the IQ issues and AIS adoption process. This study has led to the development of a framework for understanding IQ management in AIS adoption. This research was done on 44 respondents as ten organisations from manufacturing firms in Thailand. The findings of the research's empirical evidence suggest that IQ dimensions in AIS adoption to provide assistance in all process of decision making. This research provides empirical evidence that information quality of AIS adoption affect decision making and suggests that these variables should be considered in adopting AIS in order to improve the effectiveness of AIS.

Keywords—Information quality, information quality dimensions, accounting information systems, accounting Information system adoption.

I. INTRODUCTION

ACCOUNTING Information Systems (AIS) are important to any organisation, especially those which are medium and large. Unlike many enterprise-wide systems, AIS systems are often purchased off-the-shelf (due to compliance requirements, etc.) [1]. It is also noted that (as discussed below) many information system adoption theories and frameworks have placed specific focuses on the system customisation or in-house developed system, but are seen as limited regarding the various aspects of the reasons why problems have arisen in the process of implementing accounting information software. At present it is difficult to buy accounting software matched with the actual enterprise situation, making the implementation of AIS hard, because of their lack of knowledge and vision to adopt an AIS well [2].

However, business needs to be seen as adopting AIS well, because they require quality accounting information, which is critical to a company in order to organise, manage and operate processes across the business. Some organisations use AIS

vendors for implement accounting systems, while other organisations use generics, adopting standard frameworks to guide implementation of their AIS, but this may not be the best way to adopt AIS in organisations [3], [4]. Thus, this study aims at developing an AIS adoption model which provides guidance to selecting and implementing the best-matching commercially available AIS systems in order to meet various information quality requirements.

This paper describes an empirical study of managing accounting performance during the adoption of AIS within organisations. In addition, a proposed framework also attempts to identify the adoption processes that organisations should focus on to ensure quality of information during system adoption. Case studies in ten organisations in Thailand organisations were used to provide useful insights into the nature of information quality issues in AIS adoption. This paper describes and analyses case studies, and then discusses the practical implications of the findings.

II. BACKGROUND

The following literature review addresses areas including accounting information systems, uniqueness of AIS, and systems adoption overview that are relevant to the research problems. Likewise, background theories are used to focus on the research impact and develop a theoretical framework for this research.

A. Accounting Information Systems

Nowadays, an AIS is the system which measures business activities. An AIS can be a very simple manual system, a very complex system using the very latest in computers and information technology, or somewhere between these two extremes. The AIS will identify and capture relevant economic information, record information in a systematic manner, analyse and interpret the information, and report information that suits the needs of users for decision-making [5], [6]. Moreover, in accounting firms that combine traditional accounting practices such as the Generally Accepted Accounting Principles (GAAP) with modern information technology resources [7], it also provides adequate controls to safeguard the organisation's assets.

Several authors [5], [7], [9] argue that an AIS can provide assistance in all phases of decision making. In addition, accounting information can improve decision making in several ways: it identifies situations requiring management action for choosing among alternative actions by reducing uncertainty. Furthermore, accounting information about the results of previous decisions provides valuable feedback that

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can be used to improve future decisions. Additionally, [18] indicates that an AIS can improve decision making by providing accurate information in a timely manner. What is more, accounting and management decision-making is dependent on the fit of the AIS adoption with the organisation requirements, in organisations, to meet all information quality requirements.

B. Uniqueness of AIS

AIS have been a unique software application and work process for defining information. Specifically, findings from [7] state that management of AIS adoption involves the initial framing of the accounting adoption decision under accounting standards [7]. Many organisations, concerned to manage all processes of accounting, find that the information system is dependent on the accounting standards and laws of each country [3], [7], [8]. Moreover, findings [6] indicate that data integration in accounting systems should be studied more narrowly because AIS have been unique purposes is used for management accounting function.

Moreover, at present AIS still problem in organisation. Ismail argues organisation wide implementation of a new accounting system have arisen some problems in the process of development, specific features such as the lack of software matched with the actual situation of operation, the lack of knowledge and vision in implementation of accounting software [2]. Moreover, finding from research indicate that the need to ensure reliability of accounting data has long been recognised. Using the accounting information systems of management accounting data approach improves the efficiency and effectiveness of reliability assessments. Although have arisen some problems in the process of development in AIS data. The present guidance is the lack of formal concept definitions and decision rules makes it difficult to develop practical data reliability assessment accounting systems. However, business needs to be seen as well accounting system, require accounting information quality to manage and operate process in all sections [9].

C. System Adoption Overview

Fig. 1 shows that some organisations use AIS vendors for implementing accounting systems. Vendors such as MYOB, Phoenix Business System (ACCPAC), SAP, and ORACLE are leading AIS vendors [10]-[13]. These organisations have specific interests in making general solutions with follow-up customisation services for organisations worldwide.

Moreover, few researchers have attempted to understand how to choose and use (adopt) systems well in organisations. For example, authors indicate that the technology-adoption approach is particular relevant to understanding the processes and tasks of system adoption. This approach consists of a 10 step process that includes system selection, system implementation, and system use for generic adoption system.

Furthermore, the COBIT framework employs formal concept definitions and decision rules in the adoption process. This framework has been described by four domains,

consisting of Plan and Organise (PO), Acquire and Implementation (AI), Deliver and Support (DS), and Monitor and Evaluation (ME) [14]. In addition, the Systems Development Life Cycle (SDLC) is a conceptual model used in the development and implementation of technology systems as follows: Planning, Analysis, Design, Development, Testing, Implementation and Maintenance [15]. This can help organisations to guide adoption of AIS as well.

However, recently, organisations have experienced problems in the process of implementation of accounting information systems. Moreover, organisations may lack knowledge and vision to adopt AIS; accounting personnel may not understand the performance of the financial software, or may lack the knowledge and vision to adopt AIS well, making the implementation of AIS hard [3].

Therefore, in this research, the focus is placed on the organisations who choose and use (adopt) these software solutions to support their accounting needs. Especially in medium and large organisations, a multi-stages adoption process is found common to ensure that the right AIS system is acquired and implemented to support the existing business operations.

The literature shows that there are many system adoption processes in use. Some are suggested by the software vendors to the organisations who want to adopt their solutions; others are generic adoption processes. This study tries to identify the common stages from these adoption processes and use these stages to study the AIS adoption issues.

D. Accounting Information Systems Adoption Framework

The finding from multiple case studies among the 44 respondents from 10 organisations as given by different stakeholders in case A until case J used together with the available literature to build the research framework, which provides guidelines on how to ensure quality in AIS adoption (as shown in Fig. 2). The framework shows that the adoption of process management for accounting management systems is using technology-adoption to support operation, strategic management, and decision making in the firm. The model reference framework defines 41 high-level control objectives for AIS adoption processes. These categories were identified as AIS System Selection, AIS System Implementation and AIS System Use is discussed in next sections.

III. RESEARCH METHODOLOGY

This research used qualitative, interpretive evidence. Interpretive research often involves using qualitative methods from which to develop awareness gained from the data collection, and analyses the research process [16], [17]. In this study, collecting relevant information was done by conducting interviews following initial exploratory work. Literature reviews were used together with a conceptual study research method in order to develop interview questions.

Moore Phase (1999)	COBIT Phases (2006)	SDLC Phases (2007)	ORACLE Phases (2008)	MYOB Phases (2010)	Phoenix Business System Phases (2010)	SAP Phases (2010)	
1. System Selection	1. Plan and Organise(PO)	1. Planning	1. Requirements Definition	1. Identifying the stress points of growth	1. Pre-implementation checklists	1. Project preparation	Stage1: AIS system Selection
		2. Analysis	2. Design System	2. Taking the time to plan ahead			
		3. System design					
2. System Implementation	2. Acquire and Implement(AI)	4. Implementation	3. Implementing the Specifications	3. Data Conversion	2. Installing the software	2. Sizing and blueprinting	Stage2: AIS system Implementation
		5. Integration and Test	4. System integration and Test	4. Installation, set-up and configuration	3. Customising ACCPAC	3. SAP functional development	
		6. Acceptance, Installation					
3. System Use	3. Deliver and Support(DS)	7. Maintenance	5. System Training,	5. Training	4. Training	4. Final Preparation	Stage3: AIS system Use
					4. Monitor and Evaluate(ME)	6. Monitoring	
	6. Support		6. Documentation				
				7. Issues list management			

Fig 1 Existing adoption process

The first state was inductive and exploratory, beginning with a focus on detailed information drawn from theory and the literature review, to promote the development of the pre-research framework. A wide reading of the literature was balanced with consultation with professionals in related areas, to help identify and narrow the research focus. The research questions were identified and defined issues drawn from a

review of the literature in relation to the theoretical framework. The second stage was involved verifying the framework by pilot case studies which in two large Thailand organisations were used to provide useful insights into the nature of information quality issues involved in adopting an AIS. The third stage used case studies as confirmatory evidence, conducted as multiple case studies.

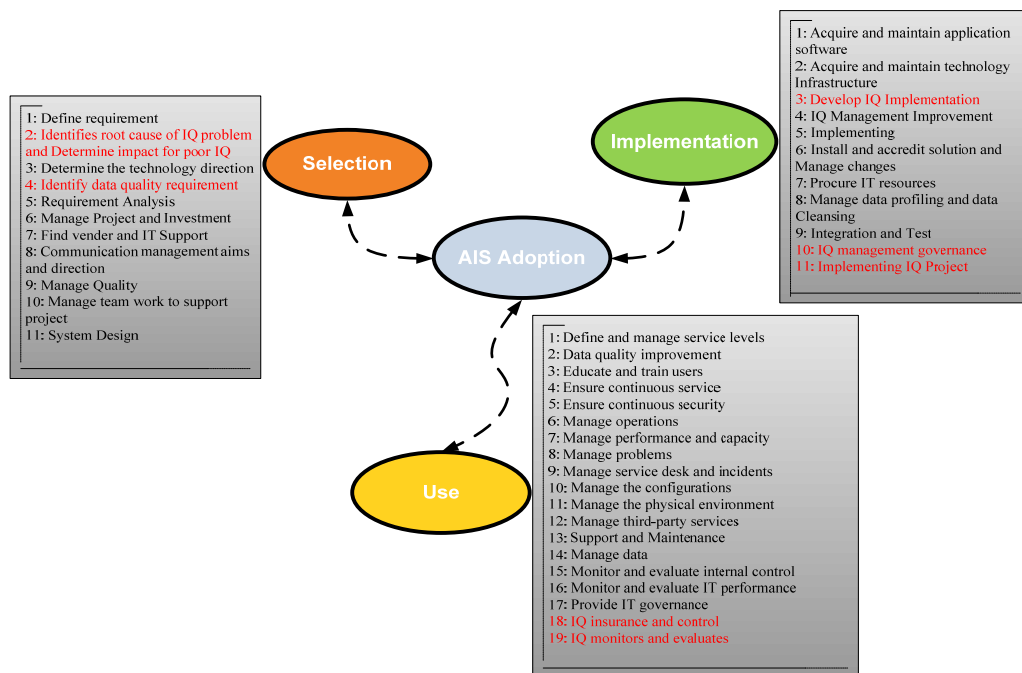


Fig. 2 AIS Adoption Model

Case studies in ten organisations from 44 respondents as confirmatory evidence, which organisations were used to provide useful insights into the nature of adopting an AIS.

Regarding this research, cases were selected by considering three dimensions – drawing on members of different industries, and the sizes and types of organisations, given that

they have dissimilar structures, cultures, processes and outcomes. This methodology has been designed to help investigate the significance of the size of organizations as this can influence the potential and actual performance of AIS. In addition, it is desirable to determine if it is possible to generate some common critical success factors for different sizes of organizations [18], [19]. In terms of the first dimension, there are different types of business - agricultural, financial, industrial, education and government. Regarding final firm selections, these companies were selected as being well-

known corporations in the Thai Listed Firms; they are regarded as powerful and also kindly provide high quality knowledge and valuable information for higher education providers in terms of education and data collection. Their contribution is acknowledged for the learning purposes of this research. The second dimension relates to organisation sectors, consisting of public and private groups. The third dimension focuses on the size of various organisations, especially large corporations and SMEs. The selected organisations are from Thailand but enable the dimensions to be addressed.

TABLE I
EXPLORATORY CASE STUDIES' INTERVIEWS DETAILS

Case	Organization Type	Organization Size	Business Nature	Interviewee's Roles in the Organization
A	Private	Large	Private national manufacturing enterprise.	CEO Technical of IT System Analyst (SA) Accounting Manager IT manager Programmer Director of IT audit division Project manager.
B	Public	Large	Government organization in the maintenance of assets	Acting Director of Finance and Division office Accountant SA Project manager IT manager division office Technical Programmer Director of IT audit division

This study used in-depth interviews to collect information as well as a semi-structured interview and unstructured interviews with stakeholders such as:

- Information producers who create, collect and monitor information for AIS.
- Information auditors who record, classify, report and interpret financial information.
- Information analysts who analyse, design, develop and operate AIS adoption.
- Information users who access and operate AIS in their work activities.
- Information managers who are responsible for managing and controlling information and information quality in AIS adoption.

In addition, data collection sources also included relevant documents, such as position description, policy manuals, organisational charts, service records, and annual reports. The purpose of the case study was to investigate how to choose and use (adopt) an accounting information system that best achieves in organisations before and during the adoption of an AIS. Moreover, qualitative data analysis methods used pattern-matching, content analysis, and cross-case synthesis as data gathered from case studies was qualitative.

IV. RESEARCH FINDINGS

Table I show that summary of case studies was findings-AIS Adoption process finding from multiple case study by different types of business-agricultural, financial, industrial,

education and government. The results of AIS adoption processes from forty-one among the 44 respondents from 10 organisations as given by different stakeholders in Case A until Case J. For the remaining factors, although to some extent conflicts still existed across all cases, the agreement across cases seems greater than the difference.

A. AIS System Selection

The first domain in framework is AIS System Selection. It is made up of 11 processes that are;

1. **Define a requirement:** involve accounting in the need to recognize value of system. These processes are identified by unique accounting requirement identifiers. These requirements define the major functions of the intended application, define operational data areas and reference data areas, and define the initial data entities.
2. **Identifies root cause of IQ problem and determine impact of poor IQ in AIS adoption :** involve identifies root cause of IQ problem and impact of poor IQ in AIS adoption by which entities are directed IT and also relation with critical input, processes, output, constitute and important component, and strategic plans of accounting management.
3. **Define a requirement:** involve accounting in the need to recognize value of system. These processes are identified by unique accounting requirement identifiers. These requirements define the major functions of the intended

application, define operational data areas and reference data areas, and define the initial data entities.

4. **Identifies root cause of IQ problem and determine impact of poor IQ in AIS adoption** : involve identifies root cause of IQ problem and impact of poor IQ in AIS

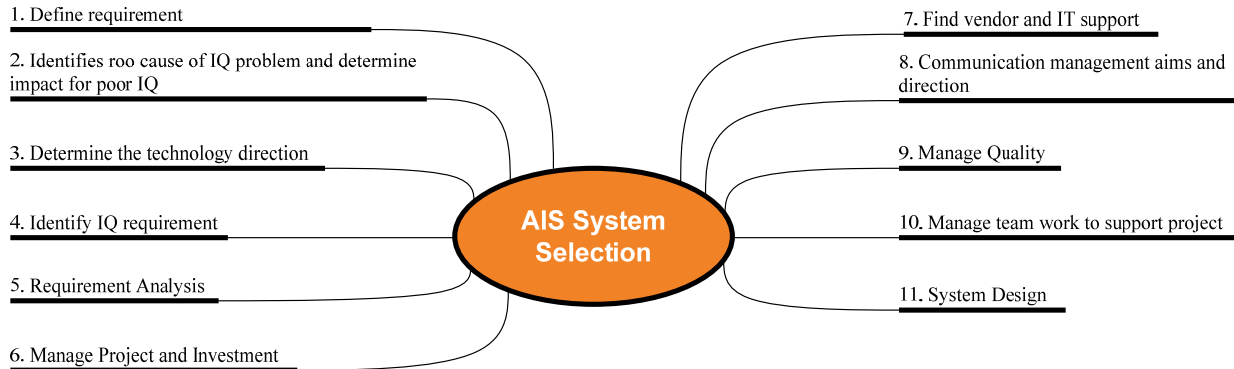


Fig. 3 AIS System Selection Process

5. **Define a requirement**: involve accounting in the need to recognize value of system. These processes are identified by unique accounting requirement identifiers. These requirements define the major functions of the intended application, define operational data areas and reference data areas, and define the initial data entities.
6. **Identifies root cause of IQ problem and determine impact of poor IQ in AIS adoption** : involve identifies root cause of IQ problem and impact of poor IQ in AIS adoption by which entities are directed IT and also relation with critical input, processes, output, constitute and important component, and strategic plans of accounting management.
7. **Determine the technology direction**: analyse existing and emerging technologies, and plan which technological direction is appropriate to realise the accounting strategy and the business systems architecture. This requires the creation of a technological infrastructure plan and an architecture board that sets and manages clear and realistic expectations of what technology can offer in terms of products, services and delivery instruments.
8. **Identify information quality requirement**: determine the information quality needs as accounting management and accounting techniques.
9. **Requirement analysis**: determine the accounting document and business processes which use by company. And also determines the root of problem from scratch which must be fixed in the system. In addition, involve IQ need analysis to determine the accounting information document and also determines the root of IQ problem which must be find solutions.
10. **Manage Project and Manage Investment**: cost justification such as operational control, product costing and profitability analysis in accounting systems.
11. **Find vendor or IT support**: companies select the factors such as purchasing, configuration and installation and also judge the quality and selection of systems.
12. **Communicate management aims and direction**: the communication supports achievement of IT objectives and ensures awareness and understanding of business and IT risks, objectives and direction relation with accounting information. These stage management develops an accounting systems by considering requirements for staff, skills, accountability, communicates policies, standard and procedures rollout, communication of accounting objectives.
13. **Manage quality**: considered to components such as quality planning, quality control, quality assurance, and quality improvement in accounting information systems adoption.
14. **Manage team work to support project**: organisation has to manage all phases of AIS system by setting up plans together with setting up team work of each process based on appropriate capability of personnel. In addition, a competent workforce is acquired and maintained for the creation and delivery of IT service to the accounting departments.
15. **System design**: The purpose of this phase is to plan a solution of the problem specified by the requirement document. It involves the detail's design of all inputs, processing, storage, and outputs of the proposed accounting system.

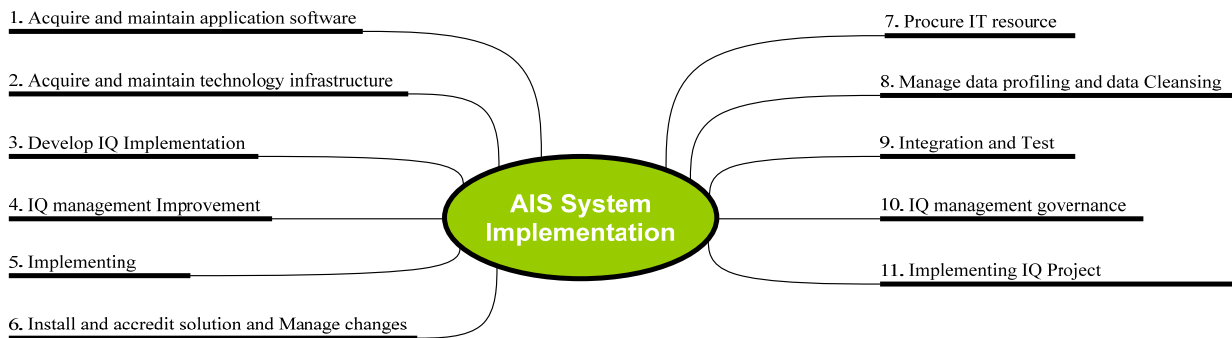


Fig. 4 AIS System Implementation process

B. AIS System Implementation

The second domain in framework is AIS System Implementation. It is made up of 11 processes that are:

- 1. Acquire and maintain application software:** writing accounting program upon business objective, user requirement, accounting objective, accounting standard, role of management accounting, and accounting techniques. Applications are made available in line with accounting requirements. This process covers the design of the applications inclusion of application controls and security requirements, and the development and configuration in line with standards.
- 2. Acquire and maintain technology infrastructure:** this requires a planned approach to acquisition, maintenance and protection of infrastructure in line with agreed-upon technology strategies and the provision of development and test environments. This ensures that there is ongoing technological support for business applications.
- 3. Develop IQ Implementation:** this phase involves applications are made available in line with accounting requirements as specific to check all process of quality of information within development and configuration in line with standards and at a reasonable cost.
- 4. IQ management improvement:** this process involves the manipulation of the data to align with the established accounting rules include standardisation, removing noise, alignment of product attributes, measures or classifications.
- 5. Implementing:** It involves accounting solution which can customise to meet their needs. This process requires the production of documentation and manuals for users and IT, and provides training to ensure the proper use and operation of applications and infrastructure.
- 6. Install and accredit solution and Manage change:** all changes, including emergency maintenance and patches, relating to infrastructure and applications within the production environment are formally managed in a controlled manner, and runs actual business.
- 7. Procure IT resources:** IT resources in accounting systems including people, hardware, software and services, need to be procured. This requires at the organisation has all required IT resources in a timely and cost-effective

manner including procurement control, supplier contract management, supplier selection, IT resources acquisition.

- 8. Manage data profiling and data cleansing:** manage information quality extends the existing data quality capabilities of the information platform to deliver pervasive data quality to all stakeholders, all projects, and all data domains for all projects and all business applications. Accounting data must be cleansed to correct inconsistencies and errors. With information quality, verifying and correcting data as it is entered into the system can cleanse the data for all applications and keep it clean, share in the responsibility for data quality and data governance, build confidence and trust in enterprise data.
- 9. Integration and Test:** data conversion, transfer and integrate existing accounting system then checks for errors, bugs and interoperability. Integrated systems are deriving information from the activity based and operation control systems to prepare external financial statements. IT bring to replace the financial reporting system from external audit standards with reconciliation modules that prepare GAAP external report statements form data that is already being collected for the managerial systems.
- 10. IQ management governance:** as part of a detailed and interesting look at International Finance Corporation's strategic data quality project, the following best practices by using data quality management software and developing data governance process to help improve their corporate data assets. Get data governance best practices and strategy information that can help you manage the data governance process within your organisation.
- 11. Implementing IQ Project:** implementing a data management initiative involves a combination of people, processes, and technology. And also IQ project can be implemented in the form of stand-alone- data quality initiatives, compliance efforts, master data management projects, and data warehousing projects, among others.

C. AIS System Use

The third domain in framework is AIS System Use. It is made up of 19 processes that are:

1. **Define and manage service levels:** this process involves category type of user to create grant user that each different user upon capability work for using accounting program. This process also includes monitoring and timely reporting to stakeholders on the achievement of service levels. This process enables alignment between IT services and the related accounting requirements as business objective.
2. **IQ improvement:** this process use of software data standards to prescribe a uniform representation of data that is used throughout the application to improve information quality. The data has been standardized; the enhancement process involves the identification of

duplicate data and taking action based upon the accounting rules that have been identified.

3. **Educate and train user:** this process involve education of all users of accounting systems, including those within IT, requires identifying the training needs of each user group. Identification of education and training needs delivery of training and education, evaluation of training received.
4. **Ensure continuous service:** the need for providing continuous accounting system services requires developing, maintaining and testing accounting system continuity plans, utilising offsite backup storage and providing periodic continuity plan training.

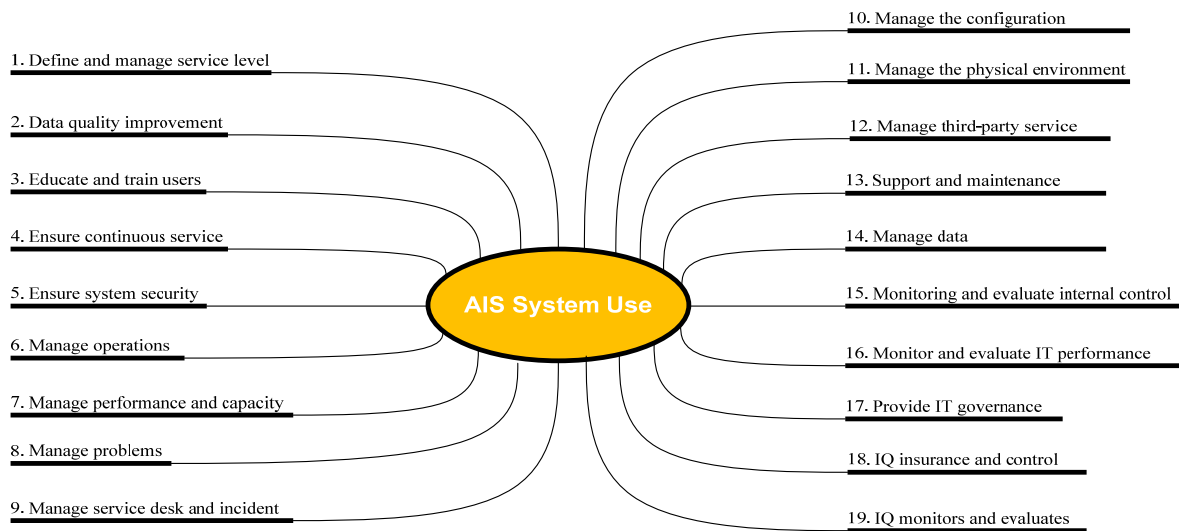


Fig. 5 AIS System Use Process

5. **Ensure system security:** the need to maintain the integrity of information and protect IT assets requires a security management process in accounting systems. Security management in accounting system also includes performing security monitoring and periodic testing and implementing corrective actions for identified security weaknesses or incidents. Furthermore, effective security management protects all accounting assets to minimise the business impact of security vulnerabilities and incidents including management of IT security in accounting systems, IT security plan, identity management, user account management, security testing, surveillance and monitoring, security incident definition, protection of security technology, cryptographic key management, malicious software prevention, detection and correction, network security, exchange of sensitive data.
6. **Manage operations:** this process helps maintain data integrity and reduces business delays and IT operating costs including operations procedures and instructions, job scheduling, IT Infrastructure monitoring, sensitive documents and output devices, preventive maintenance for software and hardware.
7. **Manage performance and capacity:** this process need to manage performance and capacity of accounting resources require periodically reviewing current performance and capacity of IT resources. This process provides assurance that information resources supporting accounting requirements are continually available including performance and capacity planning, current performance and capacity, future performance and capacity, IT resources availability, monitoring and reporting.
8. **Manage problems:** as effective problem accounting management requires the identification and classification of problems, root cause analysis and resolution of problems. The problem accounting management process also includes the formulation of recommendations for improvement, maintenance of problem records and review of the status of corrective actions.
9. **Manage service desk and incidents:** this process involve timely and effective response to IT user and accounting user queries and problems requires a well-designed and well-executed service desk and incident management process. This process includes setting up a service desk accounting function with registration, incident escalation,

trend and root cause analysis, and resolution.

10. **Manage the configurations:** this process includes collecting initial configuration accounting information, establishing baselines, verifying and auditing configuration information, and updating the configuration repository as needed.
11. **Manage the physical environment:** the process of managing the physical environment includes defining the physical site requirements, selecting appropriate facilities, and designing effective processes for monitoring environmental factors and managing physical access.
12. **Manage third-party services:** the need to assure that services provided by suppliers, vendors and partners meet accounting requirements requires an effective third-party management process in organisation.
13. **Support and Maintenance:** support and maintenance for users needed. Support is to continue development by continuously improving the business through adjustments to the Accounting information systems caused by business and environmental changes. These changes might result in future problems, new opportunities, or management or governmental directives requiring additional system modifications.
14. **Manage data:** effective data management requires identifying data requirements. The data management process also includes the establishment of effective procedures to manage the media library, backup and recovery of data, and proper disposal of media to help ensure the quality, timeliness and availability of business data.
15. **Monitor and evaluate internal control:** organising an effective internal control programme for accounting requires a well-defined monitoring process. This process includes the monitoring and reporting of control exceptions, results of self-assessments, third-party reviews, accounting report action, and internal control framework.
16. **Monitor and evaluate IT performance:** effective IT performance management requires a monitoring process in accounting systems. This process includes defining relevant performance indicators, systematic and timely reporting of performance, and prompt acting upon diversions. Furthermore, monitoring is needed to make sure that the right things are done and are in line with the set directions and policies in organisation including monitoring approach, definition and collection of monitoring data, monitoring method.
17. **Provide IT governance in accounting system:** this process involves defining organisational structures, AIS processes, leadership, roles and responsibilities to ensure that organisation IT investments are aligned and delivered in accordance with accounting strategies and objectives.
18. **IQ insurance and control:** the process of controlling the usage of data with known quality measurement—for an application or an accounting process. This process is usually done after a data quality assurance process, which consists of discovery of data inconsistency and correction.

Data quality assurance process provides following information to data quality control.

19. **IQ monitors and evaluates:** the ability to monitor the data quality processes is critical, as it provides the organisation with a quick snapshot of the health of the data within the organisation. Through analysis of the data quality scorecard results, a data governance committee will have the information needed to confidently make additional modifications to the data quality strategies in place if needed.

V. DISCUSSION AND CONCLUSIONS

This analysis was done on the data of 44 respondents as ten organisations from manufacturing firms in Thailand collected by in-depth interviews which involved on semi-structured interview and unstructured interviews. This study investigates the adoption of process management for accounting management systems. The framework provides guidelines on how to choose and use (adopt) an accounting information system that best achieves in organisation. The study states that the AIS adoption process defines 41 high-level factors. Specifically, these new factors, based on the research findings and the literature and unique to AIS adoption, including identifying the root causes of IQ problems and determining their impact, identifying IQ requirement in AIS system Selection, IQ implementation, implementing the IQ project, IQ management governance as in AIS system Implementation and IQ monitoring and evaluation, IQ insurance and control in AIS system Use (as shown in Fig 2). The evidence in this study suggests that an information quality criterion promotes AIS adoption process performance.

As a result, this study makes a contribution to the information systems literature by providing evidence on the usefulness of AIS adoption in enhancing accounting performance. This evidence suggests that organisations should obtain knowledge of appropriate information quality dimensions for accounting information systems adoption to improve work performance as well as help organisations to make profits.

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