Management Accounting Changes and the Interaction Effect of Management Accounting Practices and Integrated Information Systems on Organisational Performance: Evidence from Thailand

Nuatip Sumkaew

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Newcastle University Business School

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Abstract

The overall objective of this research was to examine phenomenon of management accounting changes in the context of Thailand, through exploring changes of management accounting practices (MAPs) and examining underlying influential factors with the use of contingency theory and diffusion of innovations theory. Furthermore this study aims to shed some light on the interaction effect of MAPs and integrated information systems (IISs) on organisational performance. A mixed method research strategy was adopted including questionnaires survey and one-to-one interviews.

The study includes five findings: three mains and two ancillaries. First, MAPs have remained relatively unchanged over the period of 2001-2012, in particular conventional MAPs are still dominant, but there are signs of diffusion of advanced MAPs (i.e. Activity-based Costing (ABC) and Balanced Scorecards (BSC)). Second, using binary logistic regression analyses, results indicate that environmental uncertainty, differentiation strategy and IIS implementation promote MAP adoption whereas a decentralised structure and organisational culture are barriers. Third, MAPs and IISs do not have any interaction effect on organisational performance; however, individually they do have positive direct impacts on organisational performance. Additionally, the considered reasons for adoption or rejection of advanced MAP are unveiled as external consultants, following other Thai lead organisations, a lack of knowledge and resources, and a lack of top management support. Finally, organisational outlook of the top manager groups (culture perspective) influenced the advanced MAP usages. Organisations with top managers reflecting flexibility values tend to use more advanced MAPs than those reflecting control values.

This study contributes to the existing knowledge of MAP changes by adding Thai organisational and cultural dimensions. This study also contributes to the inspiration for academics and practitioners to be concerned about the interaction effect of MAP adoption and IIS implementation on organisational performance (including financial and non-financial performance).

Acknowledgements

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Abbreviations

ABB	Activity-based Budgeting
ABC	Activity-based Costing
ABM	Activity-based Management
APE	Advanced Performance Evaluations
B	Budgeting Systems
BSC	Balanced Scorecard
CFROI	Cash Flow Return on Investment
CIMA	Chartered Institute of Management Accountants
CPA	Customer Profitability Analysis
CPE	Conventional Performance Evaluations
CUL	Organisational Culture
CVP	Cost-volume-profit analysis
DOI	Diffusion of Innovation Theory
DSS	Decision Support Systems
EVA®	Economic Value Added
JIT	Just-in-Time
IIS	Integrated Information Systems
IRR	Internal Rate of Return
LTP	Long-term Planning
MA	Management Accounting
MAPs	Management Accounting Practices
MCI	Intensity of Market Competition
MCS	Management Control Systems

NPV   Net Present Value

OP   Organisational Performance

PC   Product Costing

PE   Performance Evaluations

PEU   Perceived Environmental Uncertainty

ROA   Return on Assets

ROI   Return on Investment

SET   the Stock Exchange of Thailand

SG   Organisational Strategy

SMA   Strategic Management Accounting

ST   Organisational Structure

SVA   Shareholder Value Added

TC   Target Costing

TQM   Total Quality Management

Chapter 1. Introduction

The global financial crisis which has caused rapidly changes in global economy and business environment have led to intensified information flows within the organisation as well as to outsiders (Van Der Stede, 2011). Management accounting systems are used as a tool to facilitate successful organisational reforms and help organisations to survive through such rapid changes (Hopwood, 2009). A demand on management accounting information lead to inevitable changes to management accounting (Quinn, 2014; Pavlatos and Kostakis, 2015). Albeit the pace of such changes may be slower than changes observed in, say manufacturing operations, and it may vary across different countries (i.e. Chenhall and Langfield-Smith, 1998; Hyvönen, 2005; Joshi et al., 2011; Yalcin, 2012).

> "…change in management accounting is not a homogeneous phenomenon and this needs more explicit recognition in the research domain." (Sulaiman and Mitchell, 2005)

This chapter aims to provide a general introduction and motivation for this study. Background information is presented initially, with the research objectives and research questions following. Then, contribution the study which is expected to make is presented. The structure of this study is outlined at the end of this chapter.

1.1 Overview

The overall objective of this research was to contribute to the understanding of the phenomenon of management accounting changes in the context of Thailand. The empirical evidence explores changes of in management accounting practices (MAPs). Underlying influential factors are examined with the use of contingency theory and diffusion of innovation theory. Furthermore this study aims to shed some light on the interaction effect of MAPs and integrated information systems (IISs) on organisational performance.

This study is an outcome of an investigation of three issues surrounding MAPs in Thailand:

- Comparisons of current MAPs with previous practices based on studies conducted in 2001 and 2008[1];
- The influencing factors impacting on individual MAP adoption;
- The interaction effects between MAP adoption and IIS implementation on organisational performance.

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[1] Findings of this study which was conducted in 2012 are compared with results of two previous surveys conducted in 2001 (Phadoongsitthi, 2003) and 2008 (Nimtrakoon, 2009), both of looked at the same variables in the Thai context.

These issues were examined empirically through listed companies on the Stock Exchange of Thailand (SET) with the use of the mixed methods approach. The mixed methods are employed due to ability to help addressing "what and how" of a research problem on the intended consequences particularly in social science (Creswell, 2014). In this study, online questionnaire and semi-structured interviews have been employed. In addition, this study was framed within the contingency theory due to the premise that "there is no universally appropriate accounting systems which applies equally to all organisations in all circumstance" (Otley, 1980). Contingency theory was adopted to study indicating management accounting changes associated with a specific set of circumstances - the antecedents as well as their impacts on organisational performance. The research framework was also complemented by the implementation of diffusion of innovation theory based on Abrahamson's (1991) framework to investigate "why" MAPs have been diffused/rejected. Given that the use of diffusion of innovation theory to understand why management accounting innovations (MAIs) either diffuse or not is still underdeveloped (Malmi, 1999; Askarany and Yazdifar, 2015), the study may shed some light on underlying reasons for diffusion of MAIs in Thailand.

Relatively few empirical studies conducted in Thailand have been published internationally. Exceptions are as Nimtrakoon (2009) who explores adoption and perceived benefits of MAPs and their relationships with contingency factors (strategies) affecting organisational performance; Phadoongsitthi (2003) investigates MAP adoption, causes of MAP changes, relationships between degrees of perceived benefits from individual MAP and organisational financial performance, and compares MAP adoption rates with Australia and India; Nimtrakoon and Tayles (2010) who study impacts of contingency factors (environmental uncertainty, strategies, industrial type and organisational size) on MAPs (conventional and advanced MAPs); Ladawan and James (1999) who investigate how TQM diffused in three companies; and Chongruksut (2005) who studied adoption of ABC and variables associated with the adoption without studying an organisational culture factor.

Regarding the interaction between MAP and IIS, there has been relatively very limited published empirical work on this topic. So far there were two papers, the first one was conducted by Maiga *et al.* (2014), who study the interaction effects of ABC adoption and IIS implementation on U.S. manufacturing plant financial performance. The other was by Kallunki *et al.* (2011) who study the relationship between IIS, MAP and organisational performance.

It seems that relative few have studied the overall impact of contingency factors including organisational culture on individual MAP adoption and the interaction effects of MAP adoption in area of budgeting system, product costing, long-term planning, performance evaluations, decision support system on organisational performance (both financial and non-financial performance) as is done in this study.

1.2 Research Rationale

Although significant market changes put tremendous pressure on accounting to change, accounting systems are difficult to change (Granlund, 2001). Scapens (1994, p. 317) stated that:

> "…it is probably reasonable to say that accounting practices are generally rather slow to change. An interesting question is: why?..."

There are different patterns of MAP changes emerging in different countries. For instance, in the late 1990s, Japanese companies devoted greater attention to cost planning and cost reduction tools i.e. target costing than Australian companies which place an emphasis on cost control tools i.e. budgeting, standard costing and variance analysis (Wijewardena and De Zoysa, 1999). The Asian exchange rate crisis also made extreme demands on managerial information systems for planning, controlling and costing sub-systems in Malaysian companies more than those in Canadian and Singaporean companies (Sulaiman and Mitchell, 2005). Regarding MAP adoption rates, a comparison of MAPs shows there is an increasing number of advanced MAP adoption amongst India, Australia and Thailand (Phadoongsitthi, 2003). Customer satisfaction surveys and employee attitudes, considered advanced MAPs may have a greater emphasis placed on them in Finland than in Australia (Chenhall and Langfield-Smith, 1998; Hyvönen, 2005). Amongst three countries, New Zealand (N.Z.), the U.K. and the United States (U.S.), advanced MAPs usages in N.Z. is higher than in the U.K. and U.S. (Guilding *et al.*, 2000). It seems that exogenous and endogenous factors may lead to the different tendency for MAP changes over time across regions.

The impacts of causal factors including external and internal factors on MAP changes are not a uniform phenomenon. While the global dynamic changes imply that uncertainty and intensity of market competition affect management accounting information demands (Vaivio, 1999), organisations have attempted to use effective management accounting that best suits the nature of the environment, technology, structure, strategy and national culture (Chenhall, 2003). Johnson and Kaplan (1990) propose that in rapidly changing business environments, conventional MAP i.e. standard costing, traditional budgeting and CVP should not be used for

planning and control requirements or decision making. Chongruksut (2005) supports the belief that due to an inability to provide information for management of traditional costing systems in a highly competitive environment in 2001, there was an increase of ABC adoption in Thailand to gain competitive advantages and increase profitability. MAPs support strategic implementation that increases organisational performance, conventional MAPs have to be changed to advanced MAPs which assist management in strategic decision making (Yazdifar, 2003; Fleming *et al.*, 2009). Organisational design, including culture and structure, is embedded in the design of advanced MAPs. Therefore, changes in either organisational culture elements or organisational structure might impact MAPs usage (Bhimani, 2003; Henri, 2006). Hence, either exogenous or endogenous factors may influence MAP adoption.

In recent years, there is a growing trend for IISs adoption in companies. A commonly known IIS is Enterprise Resource Planning (ERP) which integrates business functions, shares one database and real-time processes. It is thought that IISs can help managers to manage management accounting information and MAPs better (Davenport, 2000; Rom and Rohde, 2006). In addition the interactive use of MAPs and IISs might enhance organisational performance, as IISs facilitate high quality of information flows thus enables advanced MAP usages so as to enhance more effective managerial decisions for improving organisational performance (Chenhall, 2003; Cadez and Guilding, 2008). The interest on researching the impact of IIS on MAP is highlighted by Youssef (2013, p. 69) who stated that "it would be insightful to study in future research management accounting change in organisations that implemented integrated information systems."

Prior empirical research suggests the existence of intrinsic impacts of either IISs *or* MAPs on organisational performance (Dale Stoel and Muhanna, 2009; Lee and Yang, 2011; Tsamenyi *et al.*, 2011), or financial performance (Cagwin and Bouwman, 2002; Pizzini, 2006; Theodorou and Florou, 2008; Dunk, 2011). Recently evidence suggests an *interactive* effect of IISs and MAPs on organisations' financial and non-financial performance (Kallunki *et al.*, 2011). IISs support data collection, reporting and analysis which involve the use of MAPs as well as decision support to enhance business competitive advantage and superior organisational performance (Rom and Rohde, 2006; Rom and Rohde, 2007).

The quantitative aspect of this study will identify the possibility of MAP adoption for the sample firms in 2012, related to contingent factors .This is the more usual application of contingency theory, as it is usually applied to study diversity of MAPs associated with various contextual variables at a point in time (Al-Omiri and Drury, 2007; Otley, 2016). Moreover,

the quantitative analysis will also explore the tendency of MAP adoption by linking to two previous studies that conducted surveys in 2001 and 2008 within the same data population – the SET. This will build up a 'time-series' or a retrospective comparison that sheds light on study changes over time. "Some insights into the forces underlying management accounting change are, however, apparent from a contingency theory perspective of management accounting." (Innes and Mitchell, 1990). In qualitative analysis, the diffusion of innovation theory was applied to increasing the understanding of motivations for advanced MAPs adoptions as suggested by Roger (2003) and Malmi (1999) in four substantial companies. Reasons "why" Thailand has been chosen in this study are explained as follows.

1.3 Background of the Research Setting: Thailand

Thailand is one of the developing countries in South East Asia and the Pacific. Thailand shares borders with Myanmar, Laos, Cambodia and Malaysia. Most Thais believe in Buddhism. The World Development Indicators (WDI) and Global Development Finance (GDF) reports that in 2010 Thailand has a population of 69,122,234, population growth of 0.6% per annum, Gross Domestic Product (GDP) 7.8 (annual %) and Inflation, GDP deflator (annual %) 3.65 (WorlddataBank, 2011). Thai is the official language and the Thai baht (THB) is official currency.

"The land of the freedom"[2] is a feature of Thailand's history (Riratanaphong, 2013, p. 127). Accordingly, as a non-colonial country, Thai culture was not influenced by Western cultures (Ibid.). Theravada Buddhist is the religion shared by a majority of Thai and it has become integral within Thai customs. Riratanaphong (2013, p. 128) identifies that "…no matter how much the society develops, the Thai way of life will still remain because the society has been rooted in kindness, generosity and harmony under the unifying spiritual centres of Buddhism.".

1.3.1 The Economy of Thailand

Thailand was one of the fastest economic growth regions in Asia before the growth came to an abrupt halt in late 1990s (Wedel and Rondinelli, 2001). During 1991 – 1995, the GDP grew by 8% a year; during 1980s, value added in industry increased 10% annually and merchandise exports to Japan and the United States increased by 20% a year. The financial and economic crises started in late 1996 and spread throughout the region in 1997. Thailand was in the midst of the worst crisis starting in 1997, GDP growth[3] was -1.3%, falling to -9.4% in 1998. The Thai government and business sectors were aggressively making changes to

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[2] http://www.thaiembassyuk.org.uk/?q=node/28
[3] http://data.worldbank.org/country/thailand

recover, creating conditions to ensure that Thailand would be a more attractive location for international trade and investment in the future (Ibid.). The economic indicators in Thailand rebounded into positive figures in 2000. White (2004, p. 105) revealed the post-crisis of late 2002 public debt reached 59% of GDP; estimates that 5% growth is necessary to service public debt; created a liquidity trap as neither an increase in money supply nor interest-rate reduction could spur demand; exports continue declining from their peak in 2000; manufacturing utilisation stood at 60% compared to 80% pre-crisis.

Thai business was significantly affected by the crisis. The financial system almost collapsed because of a huge amount of bad debt. Two-thirds of Thai finance companies were closed and the government passed laws to strengthen corporate governance (Chang, 2006). Closing down of companies, both manufacturing and service, unemployment and poverty had sharply risen (*ECONOMY*, 2007). Several problems have been identified, including excessive workforce, lack of marketing capabilities, costly raw materials compared to neighbouring countries and limits to transportation (Clark, 2011). These led to a decline in purchasing power. As a consequence, existing companies across business sectors had to restructure, downsizing or re-engineering, developing organisational strategies and improving operational effectiveness to survive in an uncertain environment (Granlund and Lukka, 1998; Chau, 1999).

Moreover, problems of both political uncertainty and the global economic crisis of 2009 led to deceleration of Thai economy (Hipsher, 2009). In the same vein, Wescott and Jones (2007) revealed that:

> "…democratic political systems have been placed on citizen participation from the national level to local governments as in Thailand… where business is far less a part of cultural tradition relative to governance, participation is growing as citizen interest groups seek to influence urban policy, planning and budgeting. (p.11)"

The economy is affected by both the monarchy and religion. Even though Thailand has been a democratic country since the 1930s, the heart of Thailand is the monarchy. Hipsher (2009; p.160, 163) reports that Thailand is a democracy in name only and the country is both a traditional hierarchical structural society and trusts more in a person than a legal contract. Deshpandé et al. (2004) explained the relationship between the Thai economy and Buddhism that:

"Thailand, an industrializing country with a market-oriented economy, reflects a strong Buddhist tradition with above average consensual organisational culture but with a more modern participative organisational climate. Low values of innovativeness and entrepreneurial culture probably reflect Thailand's path as a centre of foreign investment for low-cost manufacturing. The Asian economic crisis, triggered in part by Thailand, has tended to reduce the consensual nature of Thai management. (p.18)"

1.3.2 Accounting Development in Thailand

Accounting concepts have been developed in Thailand since the 1860s; the Royal Treasury used accounting to manage the national finances (Henry and Attavitkamtorn, 1999). In the 1930s, accounting education was introduced by the government into the university level (Pholkeo, 2013). The government policy to increase the number of accountancy professionals during emerging economy. Two pioneer universities – Chulalongkorn University and Thammasat University which had deans who obtained qualification from the Association of the Institute of Chartered Accountants in England and Wales played a significant role in accounting education development in an early stage (Ibid.). A bachelor degree in accounting programme provided by both private and public universities in Thailand is generally based on the American system. The programme includes financial accounting, managerial accounting, accounting information system, auditing, internal control, and professional ethics (Techamontrikul and Chimchome, 2005, p. 582; Pholkeo and Yapa, 2012). Not only at the university level, western culture and practices have exerted an influence in Thailand since 1930s due to the setting of constitutional and governmental reform (Pholkeo, 2013). Proliferation of multinational corporations particularly United States (U.S.) based organisations and increasing the number of Thai instructors graduated in the US caused adoption of prevailing American accounting practice and education in Thailand (Akathaporn et al., 1993). These may encourage accounting education emphasis on western practices in order to increase a room for their students in a job market. Pholkeo (2013) indicated that an interaction between accounting profession and Western accounting techniques have diffused through the Big Four firms as well as multinational companies. Additionally, Thai people including lecturers teach in a Thai university who were graduated or had experiences abroad may bring back Western ideas and apply in either companies as a worker or universities as a lecturer.

During 1940s, the first accounting professional body in Thailand – Institute of Certified Accountants and Auditors of Thailand (ICAAT) was established by Thai professional

accountant groups in order to set accounting and auditing standards. The ICAAT was closed and transferred to a self-regulatory organisation namely a Federation of Accounting Professions (FAP) which has been under the Royal Patronage of His Majesty The King since 2005 (The worldbank group, 2008).

The FAP is in charge of implementing the Accounting Professional Act under the overall administration of the Ministry of Commerce. Under this Act, an oversight committee on accounting professions was created to oversee the activities of the FAP, endorse Thai accounting standards and rules developed by the Accounting Standard Setting Committee of the FAP. Its responsibility also includes developing and reviewing audit and ethics standards in line with good international practices (Narongdej, 2008). The FAP and the Securities and Exchange Commission (SEC) signed a Memorandum of Understanding for the development of Thai Accounting Standards, auditing standards, and code of ethics for professional accountants in line with the changing international standards in 2006 in order to ensure a high quality of accounting and auditing standards (The world bank group, 2008, p. 12).

1.3.3 The Capital Market Development in Thailand

There are three organisations related to the stock market in Thailand; the Bank of Thailand (BOT), the SEC and the SET. First, the BOT was first set up as the Thai National Banking Bureau and has been in operation since 1942. It is responsible for all central bank functions. For example, creating a mechanism to safeguard against economic crisis and setting up rules to create good governance and transparency in the organisation (*About Bank of Thailand*, 2008)[4]. Second, the SEC performs the functions of the capital market supervisory agency. This organisation was established in 1992 to supervise and develop the primary and secondary markets and financial securities in Thai's capital market for both participant and institutions. The main policies are to maintain fairness in the capital market and financial market, to develop and enhance efficiency of the capital market and financial market, to maintain long-term stability of the financial system and to strengthen international competitiveness of the Thai capital market (Setthapong, 2011)[5]. Finally, the SET responsibilities are:

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[4] http://www.bot.or.th/English/AboutBOT/Pages/index.aspx
[5] http://www.sec.or.th/sec/Content_0000000105.jsp?categoryID=CAT0000428&lang=en

"to serve as a centre for the trading of listed securities, and to provide the essential systems needed to facilitate securities trading, to undertake any business relating to the Securities Exchange, such as a clearing house, securities depository centre, securities registrar, or similar activities and to undertake any other business approved by the SEC." (the Stock Exchange of Thailand, 2011)[6].

The relationship between BOT, SEC and SET is shown in figure 1.1.

Figure 1.1: The Relationship between BOT, SEC and SET
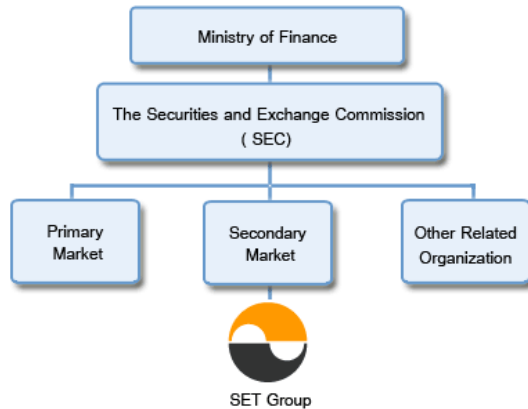
Source: the Stock Exchange of Thailand's website (2011)

In addition, the BOT represents the country's capital market. Its agency is SEC which oversees both primary and secondary markets. In the primary market, new securities that carry out an initial public offering (IPO) or offer additional securities to the public must be approved and its filing comply with SEC rules. Then SEC examines those companies' financial status and operations carefully before allowing them to issue securities to the public. The SET approves trading of securities before trading starts in the secondary market.

There are many products in the secondary market. For example, the SET50 and the SET100 which were launched due to the SET benchmark of investment provisions. The SET explains that:

"SET 50 and SET100 are calculated from the stock prices of the top 50 and 100 listed companies on SET in terms of large market capitalization, high liquidity and compliance with requirements regarding the distribution of shares to minor shareholders."

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[6] http://www.set.or.th/en/about/overview/history_p1.html#role

To create new fund-raising opportunities for innovative businesses the market for alternative investment (MAI) was launched in 1999, providing high potential growth and a greater range of investment alternatives[7].

The SET adopts Thai accounting standards which adhere closely to the international financial reporting standards (IFRSs) in principle. As planned, the IFRSs are progressively being adopted for active trading listed companies in the SET including SET50, SET100 and MAI in 2015[8].

1.4 Research Objectives and Research Questions

The crisis phenomenon that emerged and became known as a financial crisis emerged in Asia in 1997 (Clark, 2011), in Europe it started in 2006 (Pavlatos and Kostakis, 2015), in USA in 2008 (Endenich, 2014). These waves of economic and financial crises inevitably caused greater environmental uncertainty and intense market competition that business organisations had to face. In addition, organisations have encountered other rapid changes which require intensified information flows within and outside an organisation as well as high demand on management accounting information (Hopwood, 2009; Van der Stede, 2011). However, it seems that management accounting rarely changes (Granlund, 2001). Granlund and Malmi (2002) suggest that we should not overlook economic factors (i.e. a lack of resources) and organisational factors (i.e. organisational culture) as explanatory variables in this context.

The motivation to study Thailand is twofold. First, as a non-colonised country, western culture and practices (i.e. European or US) may have less influence in Thailand than neighbour countries (i.e. Singapore, Malaysia or Honk Kong). As a consequence, the MAPs in Thailand have not benefited from the latest developments in the field such as advanced MAP or the implementation of IIS, or even the presence of a professional body, like the equivalent of CIMA in the UK. As a result, there is a lack of knowledge about the international standards and good practices in the management accounting field. Second, Thai culture is dominated by the spiritual centres of Buddhism which has rooted in kindness and trust in older people. Therefore, this thesis proposes that advanced MAPs which were developed by Western countries (e.g. USA) may have a low adoption rate in Thailand due to Thai culture.

Following a literature review as presented in Chapter two, the research questions proposed are formulated considering the research objectives as presented in table 1.1.

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[7] http://www.set.or.th/en/about/overview/about_mai_vision.html
[8] http://www.iasplus.com/country/thailand.htm

Table 1.1: Objectives and Research Questions

Research Objectives	Research Questions
1. Explore the current state of MAPs in Thai companies	• Which MAPs are commonly in use in Thai companies? • What is the extent of perceived benefits from the adoption of MAPs?
2. Identify the reasons and factors which have motivated/prevented the adoption of MAPs in Thai companies	• What are the factors influencing/impeding MAP adoption in Thai companies? • Why do organisations adopt/not adopt MAPs?

3. Evaluate the impact on organisational performance of adoption of the MAPs, IISs and their interaction effect	• What are the interaction effects of MAP adoption and IIS implementations on organisational financial (non-financial) performance?
	  – What are the effects of MAP adoption on financial (non-financial) performance of organisations?
	  – What are the impacts of IIS implementations on financial (non-financial) performance of organisations?
	  – What are the combination effects of MAP adoption and IIS implementations on financial (non-financial) performance of organisations?

1.5 Contribution to Knowledge

This study is expected to contribute significantly to the limited research on management accounting in Thailand. Specifically, this study is expected to provide inspiration for scholars and practitioners to have more debates on MAP change issues and raise concerns over the cultural contests. Moreover, researchers and consultants who may perceive benefits from advanced MAPs and may plan to suggest an idea to practitioners.

The main contribution to the MA community both on demand and supply sides focuses on the causes for MAP diffusion as well as highlights issues on the impact of MAP adoption and IIS implementation on organisational performance (including financial and non-financial performance). As this study is expected to tell a comprehensive story about root causes of MAP changes, it may provide opportunities for educational institutions and professional bodies (e.g. CIMA) to understand why MAPs are diffused or rejected in the Thai context.

1.6 Structure of This Study

This thesis is comprised of seven chapters. The first chapter presents the research rationale, motivations, contributions, and summary of the research objectives and research questions.

Chapter two provides a literature review to support the study. MA changes including the adoption rates of MAPs and the extent of benefits in developed and developing countries are described together with the interaction effects of MAPs and IISs on either organisational financial performance or organisational non-financial performance. This is followed by a consideration of contingency theory. Then, research hypotheses are formulated. Diffusion of innovation theory which also used in this study presents at the end of this chapter.

Research methodology employed in this study is shown in chapter three. It comprises the research philosophy chosen and research strategies adopted to achieve the research objectives. This chapter provides the data collection methods including the design and testing of survey questionnaires and case interviews and their translations. Explanations of how questionnaires and interviews were administered, how the reliability and validity of the research instruments is assured, response rates of questionnaires and statistical methods used in this research are also addressed.

Descriptive analysis presents respondent demographics, current MAPs adoption rates and perceived benefits from MAPs in chapter four. It begins with associations between the current rates of MAP adoption, and industry type or business size. This is followed by rates of IIS

implementations. Comparisons of adoption rates and the extent of benefits gained from MAPs from 2001 – 2012 are shown in this chapter as well.

Chapter five and six contains statistical data analysis and interview findings. Factor analysis, correlation analysis, binary logistic- and multiple regression analysis have been undertaken to test hypotheses in chapter five. The interview data are analysed and presented in chapter six. Corporate background of four case studies, factors that motivated/prevented the adoption of MAPs based on Abrahamson's (1991) framework. Organisational culture measured and interaction effects of MAPs and IISs on organisational performance from the respondents' points of views are also explored, interpreted and discussed.

Finally, in chapter seven the major findings of this study are discussed, conclusions drawn, and the contributions, limitations and future research opportunities are presented.

Chapter 2. Literature Review

2.1 Introduction

This chapter attempts to present an overview of existing literature related to the main research objectives. This chapter starts with an overall of management accounting and management accounting changes across countries. This is followed by a review of contingency theory. Then, contingency factors that cause the adoption of MAPs, the interaction effects of MAP adoption and IISs implementation on organisational performance and hypotheses development are presented. Subsequently, an outline of diffusion of innovation theory is provided. Finally, an organisational culture perspective is presented.

2.2 Management Accounting and Management Accounting Practices

2.2.1 Management Accounting

MA is a major instrument of organisational management (Endenich *et al.*, 2011). It is concerned with the provision of information to users to support better decision making and improve the efficiency and effectiveness of existing operations; therefore, it could be called internal reporting (Drury, 2013). The definitions are also found in MA textbooks and professional MA institute literature, such as the CIMA and Institute of Management Accountants (IMA). It is a special accounting branch which has been used by management to serve specific needs (Weetman, 2010; p.4). Weetman (2010; p.2) refers to management accounting defined by CIMA (2009), as "Management accounting combines accounting, finance and management with leading edge techniques needed to drive successful business. It combines technical skill with business management skills". Rom (2008) restated the definition supplied by CIMA (2005) as follows: "the process of identification, measurement, accumulation, analysis, preparation, interpretation, and communication of information (both financial and operating) used by management to plan, evaluate and control within an organisation and to assure use of and accountability for its resources."

As MA history, in the nineteenth century basic cost accounting systems were using to mainly control labour cost and trace the movement of product; sophisticated costing arose at the turn of the twentieth century (Fleischman and Funnel, 2007, p. 384). Johnson and Kaplan (1987) suggested that MA should be designed to support the operations and strategy of organisations due to the current competitive and technological environment. This has brought a new array of contemporary techniques to traditional MA. Conversely, very little innovation and change results in irrelevance between MA techniques and management practices (David, 2008). Although, Ezzamel *et al.* (1990) conceded that Johnson and Kaplan in Relevance Lost may have the most influence on management accounting's history, differing alignments of

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knowledge-based expertise and disciplinary practices of management control have developed in different countries reflecting differences of national culture. Social and economic phenomena may be factors that management accountants should be concerned about in order to achieve the goal of providing MA information useful to decision makers (Solomons, 1991).

Since the early 1980s there has been an increase in research on innovative MA techniques, for example, activity-based costing techniques; costing, budgeting and management, strategic management accounting and BSC (Abdel-Kader and Luther, 2006). The International Federation of Accountants (IFAC) classifies the development of MA evolution into four stages:

> Stage 1 - cost determination and financial control
> Stage 2 - information for management planning and control
> Stage 3 - reduction of waste in resources
> Stage 4 - creation of value.
> The detail of each stage is graphically illustrated by the following figure.

Figure 2.1: IFAC presents Four Evolutionary Stages of Management Accounting
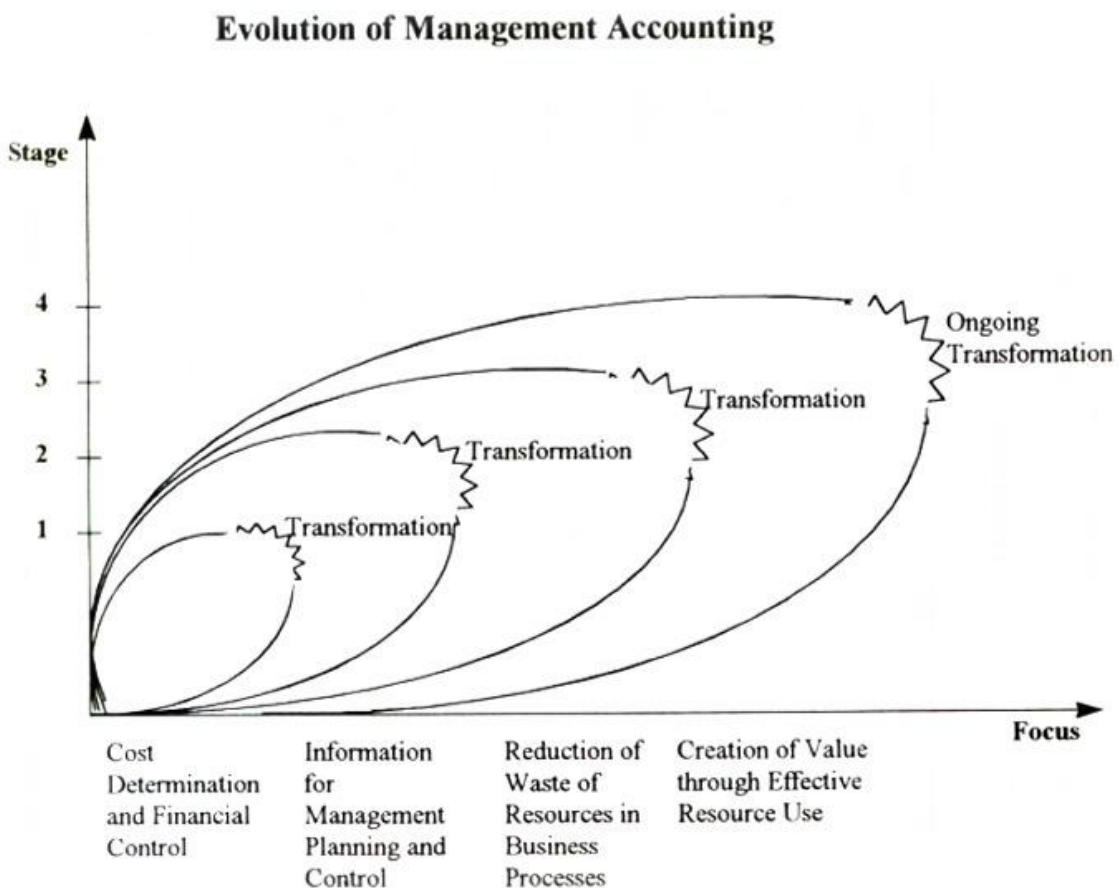
Source: IFAC (1998)

Empirical research efforts have been categorised by IFAC (1998) into four evolutionary stages of MA to reveal the current state of MA development in different countries. Abdel-Kader and Luther (2006; p.224) label evolution of MA in the UK food and drink industry, noting in 2001 that forty-one per cent of firms have Stage 2 MA systems and forty per cent were either in Stage 3 or Stage 4. In developing countries such as Thailand Nimtrakoon (2009) suggests that MA in Thailand may be reaching Stage 3 based on MA evolution identified by IFAC (1998) due to Thai's focus on waste reduction in business processes, still it is yet to know the exact stage of MA development in Thailand.

2.2.2 Management Accounting Practices

MAPs are defined and classified in many ways. One simple definition is provided by Baxter and Chua (2003) who state "Management accounting practice is inexorably intertwined with ''managerialist'' systems of ideology and manifest in, for example, constructions of ''value'' (Tinker *et al.*, 1982), ''new economic citizenship'' (Arnold, 1998), the intensification of control over labour processes (Hopper and Armstrong, 1991), and the use of control systems in multi-national and conglomerate organisations (Neimark and Tinker, 1986)".

It appears that MAPs have been increasingly used because of the influence exerted by many factors and in different stages according to IFAC's definition of MA. In the Western countries like the UK contemporary MAPs have spread from private sector to public sector organisations because of government influence (Lapsley and Wright, 2004). In Malaysia, with the influence of professional accounting bodies such as CIMA Malaysia, Mahfar and Omar (2004) find that the top seven techniques of MA applications (i.e. budgeting, income statement analysis, cash flow analysis, balance sheet and financial ratio analysis, cost and benefit analysis, and product analysis) are only used in Stage 1 and Stage 2, according to IFAC's classification of MA evolution stages (Figure 2.1). It seems that MA in Malaysia and Thailand has the same features as those in Singapore which reflect traditional MAPs more than contemporary ones (Nishimura, 2005). The American multinational enterprises have influenced Malaysia in adopting the capital budget, the payback period and present value methods, whilst American companies have influenced Philippine companies with budget, inventory management and standard costing methods (Ibid). However, Noordin et al. (2009) explore the extent of the SMA information element used in electrical and electronics companies in Malaysia and find evidence of extensive use of SMA information elements in these companies. This supports previous research studies which suggest that today's environment encourages operating companies to emphasise applications beyond traditional MA information. Thailand business has been dominated by small scale enterprises and

management ethos is largely influenced by the Buddhist religion. There is a high degree of traditional practice adopted in business practices (Nimtrakoon, 2009). Johnson and Kaplan (1987) claimed that MA systems are generally very resistant to change. Therefore it is interesting to know the stage at which Thai MA is at present.

Business environment and nature of organisations have changed considerably over time. The changes occur when the old transform into the new (Jager, 2001). MAPs can be broadly categorised into traditional/conventional and contemporary/advanced. Conventional MAPs focus on organisational issues and are financial oriented; whereas, advanced MAPs which focus on financial and non-financial information tend to be more strategically oriented (Angelakis *et al.*, 2010). Chenhall and Langfield-Smith (1998) indicate that

> "Traditional MAPs, such as cost variance analysis and profit-based performance measures, focus on concerns internal to the organisation and are financially-oriented. In contrast, more contemporary MAPs combine both financial and non-financial information and take an explicit strategic focus. This can be seen, for example, in the design of activity-based costing, contemporary performance measurement systems and benchmarking techniques."

MAPs have also been classified by their functions. For instance, Chenhall and Langfield-Smith (1998) and Angelakis *et al.* (2010) who investigate the adoption of and benefits received from MAPs in Australia and Greece, respectively, have classified MAPs into five categories: Long-term Planning (LTP), Budgeting systems (B), Product Costing (PC), Performance Evaluation (PE) and Decision Support Systems (DSS). Abdel-Kader and Luther (2008) divide MAPs into five groups, including costing system, B, PE, information for decision making and strategic analysis. Williams and Seaman (2001) who studied MA changes in Canadian manufacturing firms classify the 23 MA control systems into five components of planning, controlling, costing, directing and decision making.

MAPs could be classified and called by several names depending on measurements and functions. Example of prior studies which classified MAPs as conventional and advanced MAPs or as groups of functions: LTP, B, PC, PE and DSS are presented in appendix A.

2.3 Management Accounting Changes

MA has seen a dramatic change over the last two decades (Scapens and Bromwich, 2010). A gap between MA theory as shown in textbooks and MA in practice has emerged and driven studies of MAP variations across the world (McLellan, 2014; Robalo, 2014).

The following sub-sections address existing literature on MAPs in developed and developing countries.

2.3.1 Management Accounting Practices in Developed Countries

The tendency of MAPs in existing literature in developed countries is to carry out applications in advanced MAPs such as ABC and BSCs. However, conventional MAPs prevail in some of developed countries.

ABC as an alternative to methods of absorption and variable costing has been reported as revealing a significant variation in the usage in a number of different types of decision (Brierley et al., 2001). CIMA members predicted on the basis of an empirical study by (Burns and Yazdifar, 2001), ABC is thought as not an important MA technique, but predicted to be given greater emphasis in the future. However, existing studies were doubtful about the ABC diffusion. In the UK, Bright et al. (1992) revealed that the most widely planned and actual use of advanced MAPs was ABC at 60% of 677 for large UK manufacturing companies. Innes and Mitchell (1995) and Innes et al. (2000) conducted a survey of ABC in 1994 and replicated the study again in 1999. They pointed out that there were declines in both percentages of use from 21% to 17.5% and in the number of companies considering adoption of ABC from 29.6% to 20.3%. The number of companies rejecting ABC adoption increased from 13.3% to 15.3%. Slightly inconsistent findings were reported by Drury and Tayles (1994) on the extent of actual and planned use of ABC by UK manufacturing companies, 13% of the organisations have implemented or are in the process of implementing ABC whereas Al-Omiri and Drury (2007) indicated that a 15% adoption rate was found for ABC usage in UK companies. In addition, Askarany and Yazdifar (2012) who conducted a mail survey questionnaire of 584 qualified CIMA members in 2007 in three countries: Australia (AU), New Zealand (NZ) and UK indicate that the percentages of companies which had implemented ABC was relatively low (23.4% in AU, 22.5% in NZ and 15.2% in UK). In contrast, companies in those three countries that had rejected ABC implementations was at 52.6% in AU, 60.6% in NZ and 53% in UK.

BSC, suggested in the early 1990s by Kaplan and Norton (1987), was introduced as a new MA technique combining financial and non-financial measurements; the measurements were developed into a comprehensive management control framework in 2004 (Nørreklit and Mitchell, 2014). BSC adoption and diffusion of BSC have been increasingly studied since 1997 (Hoque, 2014). For example, Kald and Nilsson (2000) who studied the use of BSC in Nordic companies using a questionnaire reported that 27% of business units had adopted BSC

whereas 61% of the units expected to have BSC implementation within 2 years. In USA, the implementation of BSC estimate is about 60% of the 1,000 medium and large firms (Silk, 1998). In Finland, Antti Ilmari (2009) who conducted an internet-based survey in 2006 indicated that 37% of 199 Finnish companies adopted BSC; most of the BSC system was implemented during 2001-2005.Yazdifar and Askarany (2010) who conducted an online survey of registered CIMA members in Australia (AU), New Zealand (NZ)[9] and the UK found that BSC was considerably less implemented in NZ in comparison to the other two countries (21.4% in NZ, 28.6% in AU and 31.8% in UK). A high percentage of companies decided not to implement BSC with the percentages at 47.2% in NZ, 42.2% in AU and 39.4% in UK.

In addition, adoption and implementation of target costing (TC) in Yazdifar and Askarany (2012)'s survey found that TC was not considered for implementation at 62.3% in AU, 67.6% in NZ and 59.1% in UK whereas the percentages of implementation and being on a trial basis in the UK was highest amongst the three countries at 25.8%, AU at 23.4% and NZ at 21.1%. Their study suggest that there is a growing interest in the examination of all cost-reducing strategies in both manufacturing and service firms.

Evidences of other MAPs: some previous studies carried out a survey of certain MAPs and found that conventional MAPs still prevailed in developed countries. In Australia, Chenhall and Langfield-Smith (1998) examined 42 MAP adoption in 140 Australian large manufacturing firms using postal questionnaires. According to the management accounting function performed, MAPs were classified into five categories: long-term planning (LTP), budgeting systems (B), product costing (PC), performance evaluations (PE) and decision support systems (DSS). They found that large Australian firms tended to adopt PC-ABC, DSS-benchmarking and emphasises on non-financial information and the importance of strategy. They stated that different national culture and historical backgrounds contributed to the development of several MAPs within an organisation (Ibid.). In a related study, Wijewardena and De Zoysa (1999) surveyed 225 large manufacturing firms in Australia and 209 companies in Japan during 1997. Japanese companies placed a greater emphasis on managing and avoiding costs during product planning and development. As a result cost-volume-profit (CVP) analysis and target costing were commonly adopted by Japanese companies at the product planning and design stage. On the other hand Australian companies placed more reliance on traditional MAPs such as budgeting, standard costing and variance

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[9] A majority of the respondents from New Zealand was from small and medium size industries in comparison to Australia and United Kingdom.

analysis at the manufacturing stage. They attributed these different approaches to differences in national culture, business environments and characteristics of management accountants in the two countries (Ibid.).

A similar study undertook by Hyvönen (2005) in Finland with 45 preselected MAPs, indicated that Finnish manufacturing companies are placing more emphasis on both conventional MAPs and advanced MAPs including budgeting systems for controlling costs and for planning cash flows, capital budgeting measures like ROI and payback, performance evaluations-qualitative measures and employee attitude and product profitability analysis. Benefits received from conventional MAPs namely performance evaluation: divisional profit, qualitative measures and ROI, budgeting for controlling cost and product costing: variable costing were high both for the past 3 years and future emphasis. However, Finnish companies expect to emphasis advanced MAPs such as BSC, ABC, customer satisfaction surveys and product profitability analysis in the future. The results in terms of adoption rates and benefits received from MAPs in this study were also compared with the study of Chenhall and Langfield-Smith (1998) and indicated that advanced MAPs were more highly adopted amongst Finnish companies than in Australia.

In Greece, Angelakis *et al.* (2010) followed the same method as that of Chenhall and Langfield-Smith (1998) and Hyvönen (2005), a list of 45 MAPs with 157 large Greek manufacturing companies. The adoption of and perceived benefits from conventional MAPs were dominant. For example, the top five practice ranked by adoption rate were product profitability analysis (ranked 1), budgeting for controlling costs (ranked 2), formal strategic planning (ranked 3), budget for planning financial position and performance evaluation: production processes (ranked 4), and budgeting for coordinating activities across the business units, planning cash flows and performance evaluation: qualitative measures (ranked 5). Those MAPs were perceived as having high benefits as much as past benefits and future emphasis. Greek companies tended to focus less on advanced MAPs than Finnish companies. Furthermore, Pavlatos and Kostakis (2015) investigated usage and importance of 62 MAPs; the surveys were conducted in 2008 and 2013 from 301 Greek companies. The findings indicated that the use of and benefits received from ABC significantly increased whereas that from traditional cost accounting systems declined significantly. However, budgeting techniques were of continued importance.

Abdel-Kader and Luther (2006) examined MAP changes in 650 companies in the UK food and drinks industry based on a list of 38 MAPs which were classified into five groups:

costing system, budgeting, performance evaluation, information for decision making and strategic analysis. It could be noted that those groups differed from groups studied by Chenhall and Langfield-Smith (1998). Overall, conventional MAPs gained popularity amongst UK food and drinks companies. For instance, variable costing for decision making purposes, budgeting as an important part for long-term strategic planning, long-range forecasting, customer profitability analysis and performance evaluation related financial measures were majority used (more than 40%). By contrast, advanced MAPs such as ABC and EVA were important but many respondents believed that implementing them frequently was worthless.

To summarise, different countries may have different adoption rates for and perceived benefits from MAPs adoption. Although some scholars stated that advanced MAPs tended to have a greater emphasis placed on them for the future, the adoption rates of conventional MAPs, budgeting system in particullar remain high over time. The gaps between theory and practice in managemnt accounting may still exist. These MAP variations were also investigated in the context of developing countries.

2.3.2 Management Accounting Practices in Developing Countries

A mixed picture develops regarding MAPs diffusion in developing countries. A majority of studies reported adoption rates and benefits received from advanced MAPs significantly lower than conventional MAPs in the same region.

Empirical evidence reveals lower adoption rates for advanced MAPs but the extent of benefits received and future adoption expectations tend to increase in many countries. Sulaiman *et al.* (2004) who reviewed previous literature on MAPs adoption in China, Singapore, India and Malaysia suggested that the use of advanced MAPs such as ABC, BSC and target costing has not caught on in those four Asian countries. Sulaiman *et al.* (2004) quoted a study of Tho *et al.* (1998) that the probable reasons for lack of advanced MAPs usage may be due to a lack of awareness of new techniques, a lack of expertise, lack of top management support and no reasons to change. A lack of consultants, the high cost of implementation, the high cost of consultants, and a lack of journals, conferences and seminars are main reasons for non-implementation of ABC in Jordanian companies (Nassar *et al.*, 2011).

Joshi (2001) who conducted a study of 60 large and medium manufacturing companies in India reported that conventional MAPs namely budgeting to plan day-to-day operations, performance evaluation: ROI, budget variance analysis and divisional profit were ranked first for adoption. In contrast, advanced MAPs such as ABC and BSC were classified as a group

having a low adoption rate and providing low benefits. Although ABC and BSC would receive a moderate emphasis in the future, conventional MAPs such as budgeting for planning cash flows and controlling costs, performance evaluation: ROI and divisional profit were still highly emphasised. Literature review on management accounting in India by Kallapur and Krishnan (2009) reported that the prevalence of MAPs in 2003 was predominantly from a financial perspective i.e. cost-volume-profit analysis and ROI. Like Joshi's (2001) study indicated, ABC and BSC are likely to see increased use in the future because of an economic partner or international joint ventures which will facilitate diffusion of the advanced MAPs.

Luther and Longden (2001) investigated changes of perceived benefits derived from 47 MAPs in South Africa over the period 1996-2002 comparing the manner in which these benefits differ from the UK equivalents. Overall, the benefits derived from MAPs in South Africa differed from the UK. Advanced MAPs namely BSC, ABC, EVA, benchmarking, product profitability analysis had the greater value or systematically higher ranking across most practices. The explanation might be due to innovations like information technology, changes in the local business environment and increases in competition.

El-Ebaishi *et al.* (2003) investigated the use of 15 selected MAPs in 200 Saudi Arabian manufacturing companies using questionnaires distributed in 2000. The study revealed that the Saudi companies used and perceived benefits from conventional MAPs more than advanced MAPs namely ABC and JIT. It should be noted that the percentage of ABC usage (28 % of 108 companies surveyed) was relatively high compared to developed countries like the UK. Additionally, another 38% of the respondents considered ABC to be either important or very important and would consider using it in the future.

Conversely, conventional MAPs remain dominant over time across developing countries. For example,

Joshi *et al.* (2011) studied diffusion of 16 advanced MAPs amongst 244 listed companies in 2006 of Gulf Cooperation Council (GCC) Countries: Bahrain, Kuwait, Saudi Arabia, Oman, Qatar and the United Arab Emirates). Amongst 57 companies surveyed, ABC and BSC had current high adoption rates of 38.9% and 30.8% and displayed a trend toward higher adoption rates for those practices. The adoption rates of ABC was similar to prior studies conducted in developed countries whereas the percentages of BSC adoption in GCC countries was relatively lower.

In Malaysia, there were no changes in the use of MAPs by Malaysian companies. The results by Mahfar and Omar (2004) who conducted a mail survey with 156 Malaysian companies in 2000, reported that the adoption rate of budgeting systems was the first ranked of 28 MAPs whereas BSC and ABC were ranked 19 and 21. Similarly, Tuan Mat *et al.* (2010) who studied MAP changes during 2003-2007 using mail questionnaires delivered in 2008 revealed that about 49.2% of 117 Malaysian manufacturing companies have not changed in their use of MAPs. A majority of the respondents use conventional MAPs such as, budgetary control, absorption costing, CVP and standard costing and more than 80% of the respondents tend to report increase usages. Ahmad (2014) studied MAP adoption in 160 small and medium-sized Malaysian companies based on a list of 45 specific MAPs. The findings indicated that budgeting systems and financial performance measures have been widely used; ABC and non-financial performance measures have been only adopted by the minority of the respondents. These findings are consistent with other developing countries i.e. Romania, Bangladesh and Ghana (Dumitru *et al.*, 2011; Yeshmin and Hossan, 2011; Mbawuni and Anertey, 2014)

Another study undertook by Yalcin (2012) surveyed adoption and benefits of MAPs in 500 Turkish companies using online-questionnaires conducted from November 2009 to February 2010. The findings indicated that the use of and benefits received from conventional MAPs such as budgeting systems and standard costing remains strong (indicated by over 50% of the respondent companies). The adoption rates of advanced MAPs, for instance, ABC, BSC, TC, EVA and customer profitability analysis were below 50%. Turkey had a higher adoption rates for conventional MAPs than developed countries but the adoption rate for advanced MAP: ABC and target costing was still low.

In Vietnam, Anh *et al.* (2011)'s study examined the experience of 181 Vietnamese enterprises with respect to the adoption and benefits of a list of 32 MAPs in 2003 and 2009 and found that the adoption rates of and benefits received from conventional MAPs were higher than for advanced ones. The 10 top-ranked practices adoption rates were for conventional MAPs; six of the ten were classified as budgeting systems. The adoption rates of advanced MAPs, ABC and BSC, slightly increased (35.9% in 2003 to 38.1% in 2009 for BSC, 30.4% in 2003 to 32% in 2009 for ABC) but the percentage of adoption was still relatively low.

In Egypt, Abdel Al and McLellan (2011) indicated that a majority of 215 manufacturing companies use and receive benefits from conventional MAPs. Only 13% and 2% of the companies adopted ABC and BSC respectively. The average benefits derived from using

ABC and BSC were ranked 21 and 33 of 35 MAPs ranked, respectively. The advanced MAPs especially ABC does not seem to be applied in Egypt companies being virtually unknown and perceived as having limited usefulness; pricing decisions is the main purpose rather than cost reductions or performance measurement (Triest and Elshahat, 2007).

To sum up, in developing countries conventional MAPs are perceived to be more beneficial than the advanced ones. However, many scholars explained that advanced MAPs may have high future adoption rates and adoption expectations.

2.3.3 Management Accounting Practices in Thailand

The study of changes of MAPs use in Thailand to examine the current state of MAP adoption and the extent of benefits received from those practices has been considered by few authors. Prior studies revealed that adoption rates and the perceived benefits from conventional MAP were relatively higher than those from advanced ones. However, expectations for future advanced MAPs adoption tend to be slightly greater. Chongruksut (2005)'s survey in 2001 reported the extent to which Thai companies implemented the ABC practices. Their study revealed relatively low usage rate of ABC in Thailand; 11.8% of 101 companies had ABC knowledge and were ABC adopters whereas 38.62% had no knowledge of ABC. Inherent difficulties with ABC design and implementation resulted in a relatively high level of non-adopters. However, the level of intention to adopt ABC was high at 35.6% due to increased competition, growing costs and inability of traditional costing systems information to enable sound management in the new business environment.

A questionnaire study was conducted in 2007 by Kittiya and James (2009) to examine the extent of BSC usage. The study reported that about 39.8% of 123 Thai companies were BSC adopters, 13% implementing with first steps having already been taken, 28.5% considering (with concrete steps taken) to adopt, 17.1% deciding to be non-adopters, and 1.6% implementing but abandoning.

Bailes and Tabtieng (1991) surveyed the use of budget systems for planning and control purposes in 98 Thai industrial companies in 1990. The results indicated that a majority of budgeting systems used for planning and control were conventional MAPs. Budget goals were very much based on sales volume and production cost. Although the budgeting process tended to be a top down approach, participation was common for division and operating managers. Manager's bonus or salary was not determined by performance in achieving budget goals. In other word, PE in those companies were used only little for manager's promotion, with no association with budget goals.

Komaratat and Bonyanet (2008) conducted a survey in 2006 to investigate adoption of either Japanese or Western styles of MAPs[10] in Thailand. They found that full cost (absorption costing) was commonly used but not variable costing. Factors including industry types, management policy, IT supporting and employee cooperation contributed to diversification of MAPs in Thailand. Additionally, Thailand progressed rather slowly in developing value-based MAPs.

The results of a questionnaire survey conducted by Phadoongsitthi (2003) covering the period 1996-2001 indicated that conventional MAPs are the most popularly adopted MAPs[11] but there is some degree of variation in perceived benefits amongst those popular MAPs. For example, the most popular benefits from absorption costing, CVP and standard costing were perceived as beneficial for cost management, decision-making and planning and control purposes. Similarly, a study of Nimtrakoon (2009) in 2008 pointed out that the adoption rates of and the perceived benefits from conventional MAPs i.e. budgeting systems and accounting-based performance measures had more popular appeal than advanced MAPs i.e. ABC, BSC and JIT. However, over time there were major positive changes in MAP adoption and perceived benefits from MAPs in Thailand.

The reviewed studies above might indicate that there were no changes of MAPs in the Thai context. Conventional MAPs remain dominant. Moreover, the adoption of and perceived benefits from MAPs in Thailand and other developing countries, seem to lag behind that in developed countries.

Scapens (1991, p. 389) suggested that theory fails to address the reality faced by practitioners; therefore, observations of practices should be an alternative choice for future generations of textbooks. Thus, it might be worthwhile to explore the current state of MAP adoption and benefits received from MAPs in the Thai context.

2.4 Contingency Theory

Contingency theory was developed as part of organisational theory before it was recognised as having behavioural and organisational aspects for MA. Otley (1980) stated that;

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[10] The authors claimed that there was no indigenous MAP in Thailand. Thai firms tended to adopt either Japanese or Western styles of MAPs. The former referred to techniques such as TQM, JIT, Kanban and Kaizen. The latter referred to those methods promoted in Western accounting textbooks.

[11] Based on Phadoongsitthi (2003), the top ten ranked MAPs are absorption costing; budgeting systems for planning cash flows, planning and control of operation, and coordinating activities across the business unit; product profitability bonalysis; capital budgeting techniques – IRR; NPV; Payback period and CVP; performance evaluation – budget variance analysis; customer satisfaction surveys; ROI; formal strategic planning and long range forecasting.

> "The contingency approach to management accounting is based on the premise that there is no universally appropriate accounting systems which applies equally to all organisations in all circumstances. (p.413)"

As the specific circumstances of an organisation change, MA systems, therefore, should adjust if they are to remain effective (Jones, 1985). Gerdin and Greve (2008) proposed that if organisations are to perform well, organisational structure must be adapted to contingencies such as environment, organisational size and business strategy. Chenhall (2007, p. 194) stated that

> "Contingency-based research has approached the study of management control system assuming that managers act with an intent to adapt their organisations to changes in contingencies in order to attain fit and enhanced performance."

There is a potential for contingency theory based on specifying associations between MA and organisational variables such as technology, structure, strategy, culture and size under a particular business environment (Haldma and Lääts, 2002; Chenhall, 2003).

However, the key concept of contingency theory is "fit" which is central to developing the theory (Drazin and Van De Ven, 1985). There are three approaches[12]: selection, interaction and systems which have emerged as part of the conceptual approaches to fit; each alters the essential meaning of contingency theory and the expected empirical results (Ibid.). In addition, forms of fit, level of analysis, appropriateness of statistical hypothesis testing in MA studies and limitations of contingency theory have been criticised by many scholars (Luft and Shields, 2003; Gerdin and Greve, 2004; Chenhall, 2007, pp. 163-205; Gerdin and Greve, 2008).

2.4.1 Forms of Contingency Fit

There are some terminologies to describe forms of fit. Drazin and Van De Ven (1985) and Chenhall (2007) distinguish forms of fit into three categories: selection, interaction and systems. The selection approach aims to examine the relationship between contextual factors and aspects of MA without an attempt to include performance. Studies that related to either interaction or the systems approach aim to examine how organisational context influences the relationship between MA and organisational performance. However, Gerdin and Greve

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[12] Definition of each approach follows: 1) the selection approach, assumption: fit is assumed premise underlying a congruence between context and structure, 2) the interaction approach, bivariate interaction: fit is the interaction of pairs of organisational context-structure factors; it affects performance and 3) the systems approach, consistency analysis: fit is the internal consistency of multiple contingencies and multiple structural characteristics; it affects performance characteristics (Drazin and Van De Ven, 1985).

(2004) classified forms of fit as congruence and contingency approaches. The difference between those two approaches is an association with organisational performance. An objective of the congruence approach is to explore the nature of context-structure relationships without examining whether they affect performance whereas the contingency approach aims to investigate a degree of fit which is associated with performance. Moreover, an assumption of congruence approach is only the best-performing organisations survive and therefore can be observed. In contrast, the contingency approach assumes that organisations may have varying degrees of fit which could imply that a higher degree of fit is related to higher performance. Therefore, the term selection can be referred to as the congruence approach and both interaction and systems can be referred to the contingency approach.

A combination of several management control systems and contingency variables (i.e. size, and environmental uncertainty) result in complexity of level of analysis[13] in contingency theory (Luft and Shields, 2003; Burkert *et al.*, 2014) and the right statistical methods for hypotheses testing (Gerdin and Greve, 2008).

The relationship between forms of fit, level of analysis and employed statistic in MA studies will be examined in section 2.5.

2.4.2 Limitations of Contingency Theory

Contingency theory is imperfection in method (Chenhall, 2007, pp. 194-195). It appears to afford a potential explanation for traditional functionalist theories rather than interpretive and critical views (Chenhall, 2003). A number of contingency-based studies have been conducted based on surveys which may have a weak clarification of variable measurements (Waterhouse and Tiessen, 1978). Additionally, the fit amongst contingent factors and organisational variables such as structure and MA systems in one organisation may differ from another based on situation or specific circumstance. As to the fit in contingency theory, a high level of fit results in high performance (organisational outcomes); therefore, a misfit may lead to low organisational performance (Fisher, 1995; Chenhall, 2007).

To overcome those issues, this study adopted variable measurements from previous studies including several numbers of organisational performance measurements (see chapter 3). Regarding Otley (1980)'s suggestions, this study used two control variables namely

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[13] The level of analysis referred to 1) the relationship between single contingent variable (CV) and single MA, 2) the effect of single CV and single MA on organisational performance (OP), 3) the effect of single CV and multiple MAs on OP and 4) the effect of multiple CVs and multiple MAS on OP (Luft and Shields, 2003; Gerdin and Greve, 2008).

organisational size and business type to eliminate unpredictability of variables crucial to organisational success. Sulaiman *et al.* (2008) suggested that

> "…the investigation of management accounting change should recognise the specificity of the relevant circumstances of the individual organisation. These will differ and therefore good explanations of how management accounting change has come about are likely to require a case study approach. A case study approach would also enable to understand more about the specific changes that had occurred in management accounting."

Hence, case studies were employed in this study to supplement survey findings in order to gain a better interpretation of each contingency factor and explanation of MA changes.

2.5 Contingency Approaches in Management Accounting Studies

The essence of contingency theory is the forms of fit which have been applied in several literature studies in MA. Examples of fit in MA studies are outlined below.

2.5.1 Congruence Approach

The congruence approach focuses on the relationship between contingency factors and MAPs. Choice of the factors may include differences in aspects of environmental uncertainty, market competition, organisational strategy, organisational structure, organisational culture, business size and industrial type.

Paolo and Andrea (2010) used an e-mail survey to investigate the diffusion of 13 MAPs in 274 Italian manufacturing companies in 2007. The associations between a set of contingency factors namely size, structure, culture, industrial type and market competitiveness and diffusion of MAPs were found. Although MA systems were of less priority than administrative, taxation and bureaucratic tasks, managers in medium-large companies with decentralised power tended to use more MA for operational and strategic decisions than small ones. Additionally, companies operating under styles of bureaucratic or entrepreneurial and a high level of uncertainty avoidance were often negative in their adoption of advanced MAPs (i.e. ABC, BSC, benchmarking and target costing). An increase of market competition and different industry sector had encouraged the implementation of MAPs. This study indicated that the adoption of MAP was an inevitable choice for organisation survival.

Albu and Albu (2012) conducted a survey in 109 Romanian companies using contingency theory to investigate the relationship between the use of MAPs and contingency factors including environmental uncertainty, market competition, industry and size. The findings

indicated that large-sized companies adopted budgets and performance management systems as activities control mechanisms. Manufacturing companies used complexity of costing techniques more than non-manufacturing ones. The intensity of market competition was positively related to the complexity of the planning and budgeting system whereas perceived environmental uncertainty was negatively associated with adoption of MA for strategic planning.

Abdel-Kader and Luther (2008) examined the impact of 10 selected contingency factors on adoption of 38 MAPs in the UK's largest industry sector based on a questionnaire survey. The results revealed that environmental uncertainty, customer power, decentralisation, size, advanced manufacturing technology (AMT), TQM and JIT were used to explain differences in MA sophistication. Competitive strategy, processing system complexity and product perishability, however, did not associate with the sophistication of MA.

Nimtrakoon and Tayles (2010) investigated the impact of perceived environmental uncertainty (PEU), competitive strategy, size and industrial type on MAP adoption in 135 Thai companies. The results indicated that the adoption of MAPs in Thai companies were derived from PEU, a prospector strategy and size. This study suggested that when organisations were facing high risk and uncertainty the managers appear to value accounting members more highly. Thai companies pursuing prospector strategies relied on benchmarking and non-financial performance measures when they evaluated new business opportunities. Benchmarking, activity-based practices and conventional budgeting systems were adopted in large-size companies more than small companies because an evolution in the awareness of MA information is still taking place only in the large companies.

Kattan *et al.* (2007) determined the effect of the environmental uncertainty level on the design and implementation of MA systems based on a case study involving interviews and archival data in Palestinian companies over a ten-year period. The study found that the use of management accounting and control systems (MACS) were more mechanistic in times when there was environmental and political stability whereas it was more organic in periods of greater uncertainty. Although owner-managers believe that tax reporting is more important than MA information, the changes of MACS were attributable to a perception of uncertainty in the external environment which affected management's response.

It seems that the structure of congruence approach depends on context without any examined relationship affecting organisational performance. It is implicitly recognised that fit is the

result of a natural selection process; it ensures only the best-performing organisations survive to be observed at any point of time.

2.5.2 Contingency Approach

As absence of signalling survival of the fittest – organisational performance, the contingency approach has been applied to explain variations in organisational performance in terms of interaction/combination effects between context and structure (Drazin and Van De Ven, 1985; Gerdin and Greve, 2004). There are a few previous studies which investigated the impact of combinations between MAP adoption and contingency factors on performance.

Hyvönen (2007) investigated the relationship between organisational performance and customer-focused strategies, performance evaluations and information technology using 51 mail questionnaires in Finland. The results revealed two issues. On the one hand, companies that do not follow a customer-focused strategy, contemporary MA systems in combination with advanced information technology are related to high customer organisational performance. On the other hand, contemporary performance measures do not help to enhance performance of those organisations that follow a customer-focused strategy. The possible explanations were provided. Managers found that it was difficult to use contemporary performance measures in combination with customisation strategies resulting in their not enhancing organisational performance. Information technology might not be helpful and did not provide the desired benefits. Therefore, when it was combined with ineffective contemporary performance measures, it led to lower organisational performance.

Maiga *et al.* (2014a) investigated the impact of budgetary participation (BP) on budgetary outcomes namely managerial performance involving information technology for enhanced communication (ITEC)[14] and ABC as moderators. Questionnaires were employed within 691 U.S. manufacturing companies. The responses indicated that there was no main effect of BP, ITEC and ABC on budgetary outcomes. While ABC acted as a moderator the relationship between budgetary participation and budgetary slack, ITEC did not affect this relationship. However, ITEC and ABC significantly moderated the relationship between budgetary participation and managerial performance. Suggestions of the study were ITEC would reinforce the effect of budgetary participation on managerial performance as the costs of data collection and processing decline and the availability of managerial information improves.

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[14] ITEC consisted of Intranet i.e. managers' use of computer networks to enhance internal communication amongst employees within an organisation.

Maiga *et al.* (2014b) investigate the interaction effect of cost control systems (CCS)[15] and information technology integration (ITI) on manufacturing plant financial performance in U.S. manufacturing plants using a questionnaire survey. They indicate that while ITI and CCS did interact to create a positive impact on manufacturing plant financial performance, both ITI and CCS had independent effects on the performance. Therefore, when combined CCS with ITI would provide the greatest financial performance benefits. The findings of this study were recommended to managers involved in resource allocation decisions.

2.6 Contingency-based Studies on Management Accounting Practices and Hypotheses Development

This study concentrates on identifying particular contingency factors that influence the adoption of MAPs in Thailand as well as the impact of a combination between MAP adoption and IIS implementation on organisational performance. The following sections present hypotheses development.

2.6.1 Perceived Environmental Uncertainty (PEU)

Environmental Uncertainty is a set of factors that make top managers' perceived inability to predict the external environment condition of an organisation in a given area such as competitors' action in the market, customers' preferences and changes of economic and technology factors (Chong and Chong, 1997; Merchant and Van der Stede, 2012, p. 686). Additional MA information may be required by managers to manage the uncertainty and complex environment (Gordon and Miller, 1976).

PEU has been used to examine its effect on MAPs in both developed and developing countries (Abdel-Kader and Luther, 2008; King *et al.*, 2010). King *et al.* (2010) examine the influential factors of budgeting practices in Australian healthcare businesses using a contingency approach (including variables such as size, organisational structure, strategy and PEU). They find that a component of PEU namely dynamism is negatively associated with budgets. Abdel-Kader and Luther (2008) find that higher PEU is associated with the increased use of MAPs in the UK. Gul and Chia (1994) reveal that firms facing high PEU obtain a greater degree of benefits from the use of MAPs than firms facing low PEU. They also find inherent links between the use of MAPs and enhanced managerial decision-making and improved firm financial performance. In other words, there is high correlation between the need to improve quality of decisions and financial performance under high PEU and high demand for MAPs information (Chong, 1996). In developing countries, results are

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[15] CCS was measured by an adoption of activity-based costing.

inconclusive. For example Tsamenyi and Mills (2003) find that PEU has no influence on the uses of MAPs in Ghana, though Nimtrakoon and Tayles (2010) find an association between the increased use of MAPs and high PEU in Thailand. It is, therefore, worth investigating if PEU has any impact on individual MAP adoption in Thailand. Thus,

H1: When facing high PEU the probability of firms adopting MAPs is higher than that of firms for facing low PEU.

2.6.2 The Intensity of Market Competition (MCI)

Market competition is considered a powerful factor affecting MAPs, as firms are challenged by a wide range of changes such as productivities, cost and quality, distribution channels and customer satisfaction (Chenhall, 1997). Consumers are now more accustomed to new products and services than in the past (Redmond, 2004). To enhance customer satisfaction, organisations place greater focus on customer requirements and product design (Banker, Lee, Potterand and Srinivasan, 1996). Firms facing intense competition tend to use more MAPs, as managers need better MAP information in order to make accurate and effective decisions (Mia and Clarke, 1999). Maqbool-ur-Rehman (2011) finds that the use of some advanced MAPs, like EVA, is influenced by intensity of market competition. Hoque (2011) also finds a close association between the degree of market competition and increased use of individual MAPs. Thus,

H2: Firms under high MCI are more likely than others to adopt MAPs

2.6.3 Organisational Strategy

Strategy is one of the more commonly used contingent factors (Drury, 2009; Chenhall, 2003; Chenhall and Langfield-Smith, 1998b). Over the years, studies of generic strategies have fallen into three groups. Miles and Snow (1978) use prospectors/analysts/defenders model to analyse competitive strategy, whilst Gupta and Govindarajan (1984) employ build/hold/harvest model to interpret the strategic mission concept. Porter (1980) presents two generic strategies for achieving competitive advantage, i.e. product differentiation and cost-leadership. Langfield-Smith (1997), Chenhall (2003) and Abdel-Kader & Luther (2008) reconcile these models with a continuum; prospectors/builders/product differentiators and defenders/harvesters/cost-leaders.

It is noted that firms following different competitive strategies tend to adopt different types of MAPs (Anderson and Lanen, 1999). In particular, Langfield-Smith (1997) and Chenhall (2003) indicate that organisations adopting prospect/build/product differentiate strategies do

require management accounting information systems more than those adopting defend/harvest/cost-leadership strategies. Chenhall (2003) finds that advanced MAPs such as benchmarking, strategic planning techniques and activity-based techniques are associated with firms adopting high product differentiator strategy. Pavlatos (2010) also confirms that advanced MAPs namely ABC is used in firms following a differentiation strategy more than firms following a cost-leadership strategy, though his study does not find any association between financial-based MAPs and competitive strategies.

Nimtrakoon and Tayles (2010) reveal that Thai firms adopting prospector strategy gain higher benefits from advanced MAPs than those adopting defenders strategy do. It is evident from the aforementioned studies that use of different competitive strategies may lead to varying use of individual MAPs. Thus,

H3: Firms adopting a differentiation strategy will more probably adopt MAPs than firms not adopting this strategy.

2.6.4 Organisational Structure

Organisational structure affects the design of management control systems (MCS) (Waterhouse & Tiessen, 1978). Characteristics of organic structure refer to more decentralisation, low vertical differentiation and fewer hierarchical layers as well as non-formalization and horizontal mode of communication than those of mechanistic structure (Gosselin, 1997). It is found that organisations with organic structure are more likely to adopt advanced MAPs namely ABC than those with mechanistic structure (Ibid.). Decentralisation gives business unit managers greater responsibility over planning and control activities as well as providing access to information that is not available to 'the centre' (Abdel-Kader & Luther, 2008). This leads to a greater need of MA systems in order to support managers in their planning, controlling and decision-making activities in decentralised companies. Islam, Quazi, and Rahman (2011) support this finding, in that companies with more decentralised structures require more MAPs to help improve information gathering and sharing and enhance transparency in information flow.

Less hierarchical levels and increasing cooperation amongst departments can facilitate managers to understand more of the underlying drivers of organisation performance and to commit to achieve the same business goals (Lee & Yang, 2011). They also find that organic structure makes greater use of some MAPs (e.g. BSC). Chenhall (2008) argue that advanced MAPs such as ABC, BSC have not had any significant association with organic organisation but further study with different area of MAPs may provide valuable. It is apparent that an

organic organisation may affect degrees of MAPs adoption more than a mechanistic one. Thus,

H4: Organic firms have a greater probability of MAP adoption than mechanistic firms.

2.6.5 Organisational Culture

Culture is seen as 'a coherent system of assumptions and basic values and beliefs which distinguish one group from another and orient its choices is, of its very nature, a tenacious and unalterable phenomenon (Gagliardi, 1990, p. 287).' The embodiment of culture often contains symbols, ideologies, languages, belief, rituals, and myth, created deliberately by an enterprise (Pettigrew, 1979). This enterprise can be a society, a country or an organisation.

Different definitions of organisational culture have been proposed from social, psychological and managerial studies. Some researchers interpret the development of organisational culture from a viewpoint of the role of organisational leadership, which is formed through a leader's scope for action and an organisational process of acquiring the organisational values to become an institution (Peters, 1978; Pinch et al, 1989; Schein, 1983; Selznick, 1957). Gagliardi (1990) looks at organisational culture from the identification of four hierarchical levels in the organisation's lines of action. According to Gagliardi (Ibid, p. 293),

> "Primary strategy, which was the maintenance of its cultural identity, is linked to the organisation's basic values, which is the root cause of culture. … Secondary strategies were concerned with the choice of territory and methods of competition. At the final level of specificity secondary strategies become the organisation's implementation modes, i.e. perceivable forms of behaviour and operations."

Existing studies reveal that organisational culture has contributed to different ways that management control systems (MCS) and MAPs are adopted (Harrison & McKinnon, 2007; Van der Stede, 2003; Yew Ming & Hian Chye, 2007). Tsamenyi and Mills (2003) revealed that organisations with high or low hierarchical order may affect the ways in which managers are involved in budgeting processes in the context of developing countries. O'Connor (1995) and Yew Ming and Hian Chye (2007) find similar cultural influence in Singapore. Granlund (2001) argued that accounting systems are difficult to change; one of forces affecting the accounting system development which causes stability is conservative organisation culture.

Thai religious belief and family backgrounds can create a diversified impact on Thai business contexts (Runglertkrengkrai & Engkaninan, 1987). It is found that Thai people accept a hierarchical order and prefer a formal way of communication in business contexts (Vance,

McClaine, Boje, & Stage, 1992). Hofstede (2001) confirms that Thai people are more susceptible to the power inequalities in organisations, institutions and societies. Therefore it is worth investigating organisational culture using hierarchical order dimension (power distance) to test whether or not hierarchical order affects MAP adoption.

H5: The more power distance in an organisation leads to a lower probability of MAP adoption

2.6.6 Integrated Information Systems (IISs)

IIS has been defined in a general field and in a management accounting field. IIS is commonly defined as a computer-based management system which integrates all aspects of a business's functions such as planning, sales, inventory, marketing, human resource and accounting (Curtis and Cobham, 2005). Tian and Sean Xin (2015) supported the association of functional and operational processes of an organisation, for example, customer and sales, supply chain management and accounting and finance are supported by the IIS systems. The systems also provide streamline information flows within and across business processes enabling users to access data in concert for information processing (Ibid.). In the management accounting field, in turn, Chapman (2005) defined IIS as fundamental enterprise packages that have transformative implications for the nature of integrally integrating business functions and control into a common database. All data are integrated, automated processes, providing the ability to disseminate timely and accurate information (Chapman and Kihn, 2009).

The IIS is considered to have an effect on the design of the accounting system (Otley, 1980). The role of MA has been changed by the IIS due to providing management with easy and fast access to relevant and real-time operational data needed in decision-making and management control (Kallunki et al., 2011). Granlund (2001) suggested that IIS may help organisations to overcome serious doubts about the reliability of MA information issues; the prevailing systems would create the potential for the modernisation of MAPs with enhanced strategic management support. Regarding improving the quality and speed of MA information, advanced MAPs such as ABC have been increasingly adopted (Maiga et al., 2014). Formalised categories for collecting and reporting information, and standardisation which supports ability to access MA information and communicate it among members in the organisation facilitate MA information usage (Wouters and Verdaasdonk, 2002). Rom and Rohde (2006) indicated that MAPs involving the use of either financial or non-financial data are supported by the IISs due to the IISs support data collection, reporting and analysis in accounting systems. Conventional MAPs (i.e. budgeting) which involves financial data usage may be better supported by IISs in terms of data collection whereas advanced MAPs (i.e.

ABC and BSC) which involve non-financial data usage may be better supported by IISs in the area of reporting and analysis. Consequently, IIS implementation may facilitate MAP adoption in order to produce more efficient and effective MA information for decision-making (Scapens and Jazayeri, 2003). Ismail (2007) indicated that an inadequacy of IIS implementation results in non-BSC adoption because of lack of information and a sophistication of BSC which requires a well-structured system to support data gathering and dissemination across multiple departments within a company.

Chapman and Kihn (2009) examined the relationship between IIS approaches such as ERP and management control from 169 Finish managers and find that the level of IIS is related to perceived management accounting system success. IIS implementation also had encouraged MAP adoption in particular areas of budgeting systems and product costing. For example, these are more detailed, accurate, and quickly reported in capital budgeting, budgeting, operating statements, forecasting, performance measurement, and costing of Canadian firms because of allowing ERP systems (Spraakman, 2005). The ERP systems affect MAPs, particularly capital budgeting techniques in an Australian study (Jackling and Spraakman, 2006). The impetus for customer profitability analysis also involves in IIS implementation because it possibly records more information such as customer data, number of orders, number of sales visits and number of service calls (Van Raaij *et al.*, 2003). Consequently, organisations had opportunities to actually calculate customer profitability.

Hyvönen *et al.* (2006) illustrated that

> "the ERP-linked ABC system had a key role in re-embedding the MA knowledge that was needed to unify the previous systems, whose heterogeneity was a result of recent company mergers and acquisitions. Hence, software packages and some degrees of freedom in the implementation process may actually enhance actors' "blind" commitment to the system and reduce resistance to the new system".

Silva *et al.* (2011) argued that although IISs had improved the quality of the management accounting process (limited to five main practices; capital budgeting, budgeting, forecasting, activity based costing and reporting), implementation of IIS had a low impact on the decision making process. It seems that IIS implementation may have an impact on the use of MAPs. Thus,

H6: Firms implementing IIS are more likely to adopt MAPs

2.6.7 Management Accounting Practices, Integrated Information Systems and Organisational Performance

Several empirical studies have proposed an association between MAPs adoption, IIS implementation and organisational performance[16] including financial and non-financial performance.

➤ **MAPs and Organisational Performance**

The use of MAPs may provide enhanced information that improves decision-making and reinforces better achievement of organisational goals; consequently, relevant MAPs and useful information enhance organisational performance (Chenhall, 2003). Simoens and Scott (2005) suggested that organisations should realise greater financial performance benefits when MA information are increasingly integrated. A comprehensive picture of impact of MAP usages on organisational performance has been studied by several scholars. MA literature reveals mixed empirical evidence with respect to either organisational financial performance or organisational non-financial performance achieved from MAP adoption. For instance,

Baines and Langfield-Smith (2003) findings proposed that the changes of advanced MAPs such as product profitability analysis, benchmarking, ABC, EVA and target costing have led to improved organisational performance. The advanced MAP changes result in a greater reliance on non-financial accounting information (i.e. on-time delivery, customer satisfaction, market share, employee satisfaction and employee training) which have a positive impact on organisational performance.

Rong-Ruey *et al.* (2009) conducted a survey of 219 Chinese companies in seven areas: Guangdong, Fujian, Heilongjiang, Jiangsu, Shaanxi, Sichuan, and Tianjin to explore the effects of MAPs usage on organisational performance. The results indicated that a positive association existed between organisational performance and the usage of some MAPs such as CVP, cash flows, EVA, performance-based compensation systems, kaizen costing, standard costing and TC. MAPs had been used as an important tool by Chinese managers in response to a competitive marketplace and management support.

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[16] As an outcome, organisational performance refers to an aggregation or an average between financial and non-financial performance of organisations. Some existing literature measure organisational performance as an average of non-financial aecformance (i.e. employee morale, job satisfaction, customer satisfaction, on-time delivery to customers) and financial performance (i.e. return on assets and return on sales) (Rong-Ruey et al., 2009).

Kennedy and Affleck-Graves (2001) studied the impact of ABC adoption on organisational financial performance by comparing UK organisations adopting ABC that outperformed matched non-ABC organisations over a 3 years period. The results indicated that ABC enabled greater organisational value through better cost controls, asset utilisation and reinforcement of greater financial leverage. Macinati and Anessi-Pessina (2014) indicated that a significant positive impact exists between the use of MA such as budgeting and product costing and financial performance of organisations (i.e. reducing deficits) in Italian public health-care.

Abdel-Maksoud *et al.* (2015) investigated the relationship between the use of non-financial PE and organisational financial performance in 106 medium and large-sized Italian manufacturing companies. They found a positive impact from the use of PE which focused on the intangible aspects of employees associated with organisational financial performance as reported by return on assets.

Moreover, there is a relationship between organisational non-financial performance and the number of MAPs usage. De Geuser *et al.* (2009) investigated whether the adoption of PE like BSC adds value to companies based on 76 business units from different companies in UK, Germany, Austria, France and Netherlands; if so, how does it contribute to organisational non-financial performance. The study demonstrated that a contribution was made to non-financial performance of companies by the adoption of BSC.

Conversely, it has been found the use of MAPs might not have any significant association with organisational performance. For example,

Banker *et al.* (2008) estimated the impact of ABC on financial performance in a large cross-section of US manufacturing plants. They proposed that the adoption of ABC did not directly contribute to an increase of unit manufacturing costs, cycle time and product quality unless the plants implemented world-class manufacturing (WCM) practices such as JIT, TQM and benchmarking. The WCM practices allow plant managers to adjust to volatilities associated with customer demand and provide capabilities to rapidly react.

Selto *et al.* (1995) who studied the fit between MAPs and organisational performance within 500 large companies in USA suggested that a misfit existed between improving manufacturing performance of workgroups and the adoption of advanced MAPs such as JIT and TQM. Banker *et al.* (2008) reported that product costing-ABC had no significant direct

impact on financial performance of US manufacturing plants in terms of improving unit manufacturing costs, cycle time and product quality.

Similarly, Ittner *et al.* (2002) studied 2,789 US manufacturing plants and found that extensive ABC may allow improvements in cycle time and quality leading to cost reductions. An extensive ABC use, however, had no association with organisational financial performance.

Harlez and Malagueño (2015) also indicated there was no direct association between the use of performance measurement systems and hospital performance as measured by six items: financial health, ability to attract doctors and nurses, reputation of the hospital, undergraduate and graduate medical/health professional teaching, research and quality of care.

The relationship between the use of MAPs and organisational performance is inconclusive. The implementation of IIS may cause those ambiguous results. Thus,

H7: There is a positive association between the number of MAP adoption and a firm's *financial* performance *before* IIS implementation.

H8: There is a positive association between the number of MAP adoption and a firm's *non-financial* performance *before* IIS implementation.

H9: There is a positive association between the number of MAP adoption and firm's *financial* performance *after* IIS implementation.

H10: There is a positive association between the number of MAP adoption and a firm's *non-financial* performance *after* IIS implementation.

➢ *Integrated Information System and Organisational Performance*

Previously, it took a rather long time to prepare accounting reports, not only a managerial accounting report but also a financial report. Business functions had their own information systems and operated separately (Davenport, 1998). If managers requested a sale report/forecast, management accountants required information from both a sales department and a manufacturing department. To put the information together, accountants had to track sales activities; recording sales and developing sales forecasts at the sales department and production planning at the manufacturing department. Reports to support managers and transactions in individual business required many steps to prepare a financial statement. Posting transactions to the journals and transferring the journal entries to a general ledger based on the chart of accounts took time to process.

Since 1990, companies have requested an integrated set of financial, cost and performance measurement systems in order to create products at a low-cost and make an operational learning and improve environment (Cooper and Kaplan, 1999; p.498). Therefore, IISs which are designed connecting with accounting processes are introduced by non-accountants (Chapman, 2005). The systems automate the accounting processes by posting transactions to journals and transferring the journal entries to a general ledger according to the chart of accounts in individual businesses (Brady et al., 2001; p.18). The routine tasks of management accountants and subsequent transition such as a transaction-oriented information gathering and a business oriented information analysis have been reduced by the implementation of IISs (Granlund and Lukka, 1998; Rom and Rohde, 2006; Grabski *et al.*, 2011). These may lead to an impact of IIS implementation on organisational performance. Hunton *et al.* (2003) indicated that organisational financial performance such as ROA, ROI and asset turnover was better over a three-year period for organisations which implemented IIS, than for non-adopters. The IISs are also integrating best practices in business processes in areas of strategic management, decision making, and execution and review to maximise stakeholder returns (Fahy, 2001, p. 11). Thus,

H11: There is a positive association between the adoption of IIS and a firm's *financial* performance

H12: There is a positive association between the adoption of IIS and a firm's *non-financial* performance.

➢ *The Interaction between MAPs and IISs*

The IISs which might lead to corporate realignment and accelerated product lifecycles provide a degree of synergy or interoperability and supports aspects of a company's information needs (Davenport, 2000). The systems facilitates integrated information sharing across business processes, reducing manual intervention and generally improving decision-making activities (Poston and Grabski, 2001). Moreover, the IISs provide organisations' management control systems meant to by-pass the control system and invisible work (work-arounds) (Beaubien, 2012). Consequently, conventional or advanced MAP information which are produced from IISs may become more efficient and effective for decision-making and control systems (Scapens and Jazayeri, 2003; Rom and Rohde, 2007).

Rom and Rohde (2007) indicated that research on a combination of MA and IISs will provide a growing body of knowledge and new opportunities for adapting MA information to the

needs that link to organisational performance. Recently, Hyvönen (2007) suggested that advanced performance measures (i.e. non-financial measures, BSC, customer satisfaction surveys and qualitative measures) in combination with IIS are related to high organisational non-financial performance (i.e. customer performance). The combinations between cost control systems (i.e. ABC) and IISs, in turn, provided a positive impact on manufacturing plant financial performance; they did not provide independent effects on the plant financial performance (Maiga *et al.*, 2014b). The evidence is still rather limited on some areas of MAPs (i.e. DSS, B and LTP). Thus,

H13: The interaction between the number of MAP adoption and IIS implementation is positively related to a firm's financial performance.

H14: The interaction between the number of MAP adoption and IIS implementation is positively related to a firm's non-financial performance.

To sum up, almost all research questions in this study were associated with the hypotheses above. Only one research question – "why do organisations adopt/not adopt management accounting practices?" – has not been answered. Diffusion of Innovation theory is employed to identify the reasons and factors which motivated/prevented the adoption of management accounting practices in Thai companies.

2.7 Diffusion of Innovations Theory

Acceleration to increase understanding of the motivations for adopting innovation such as advanced MAP has been urged by Roger (1983, p. 98) suggested by (Malmi, 1999, p. 652). Diffusion researchers are rarely conducting a research to address "why" innovations have been adopting or have not (Malmi, 1999; Askarany and Yazdifar, 2015).

> "Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas. Communication is a process in which participants create and share information with one another in order to reach a mutual understanding." (Rogers, 1983, p. 5).

Innovation[17] is the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order (Van de Ven, 1986). Similarly, the innovation definition given by Rogers (2003, p. 12) stated

> "an innovation is an idea, practice, or object that is perceived as "new" by an individual or other unit of adoption".

The "newness" in an innovation may refer to people who have knowledge or have known about an innovation for some time but not yet considered to adopt or reject it (Ibid.).

Despite this, the innovation could be either a new idea or an old idea in a new context where perceived or viewed by people as a newness; it could be old ideas which were reintroduced into the same context at a later period (Evan and Black, 1967; Firth, 1996). Although newness helps to differentiate innovation from change (Rogers, 2003, pp. 15-16), changes in organisations could be involved in an innovation (Becker, 2014).

Sulaiman and Mitchell (2005) presented a typology of change in MA as follows;

- Addition: introduction of new techniques as extensions of the MA systems (e.g. the first-time introduction of a quality costing system).
- Replacement: introduction of new techniques as replacements for an existing part of the MA systems (e.g. the replacement of traditional costing with ABC).
- Output modification: modification of the information output of the MA systems (e.g. the representation of numerical information in graphical form).
- Operational modification: modification of the technical operation of the MA systems (e.g. the use of a pre-determined as opposed to an actual overhead rate in an existing costing system).
- Reduction: the removal of a MA technique with no replacement (e.g. the abandonment of budgeting).

Hence, all types of changes that are perceived by an organisation as new, the typology of changes above may be considered as an innovation. As this study aims to identify the reasons for adoption or non-adoption of MAPs in Thai companies, only two types of change: addition and replacement are of concern.

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[17] An innovation/an administrative innovation in this study is viewed as advanced management accounting practices as studies of (Firth, 1996; Malmi, 1999; Lee and Yang, 2011).

2.7.1 Critical Considerations

According to a critique of diffusion research, Rogers (2003, p. 106) identified that although diffusion research has made significant contributions to an understanding of human behaviour change, it would have a "pro-innovation bias".

> The "pro-innovation bias" is the implication in diffusion research that an innovation should be diffused and adopted by all members of a social system, that it should be diffused more rapidly, and that the innovation should be neither re-invented nor rejected….to shed the pro-innovation bias, an "anti-innovation bias" may be an alternative for diffusion researches" (Rogers, 2003, pp. 106, 112).

The pro-innovation bias suggests that innovations and the diffusion of innovations will benefit adopters (Abrahamson, 1991). This view could imply that organisations will adopt only efficient innovations which benefit the organisations, inefficient innovations will never be adopted or always be rejected (Dewar and Dutton, 1986; Perera *et al.*, 2003). People will adopt an innovation when they perceive usefulness; if not the innovation will be called a mistake or resistance to innovation exerted (Van de Ven, 1986).

The pro-innovation bias would be useful to explain reasons for adoption of innovation, gained benefits, but it fails to explain why efficient ones are rejected or why innovations are not adopted (Kimberly and Evanisko, 1981; Rogers, 2003, p. 112). As alternative research to overcome pro-innovation bias, Rogers (2003) suggested that scholars should put an emphasis on "why" questions which occasionally have been used in the diffusion of innovation studies, "how" innovations diffuse slowly and "how" the innovations have been rejected or discontinued.

2.7.2 Alternative perspective – Abrahamson's (1991) Framework

To overcome the criticism of DOI in terms of the pro-innovation bias, Abrahamson (1991) proposed a framework which has potential answers such as "why" inefficient innovations do diffuse and "why" efficient innovations are rejected. The Abrahamson's framework indicates prompt processes that the adoption of efficient innovations may coexist with processes that prompt the adoption of inefficient ones. Thus, this framework as presented below would explain the diffusion and rejection of innovations.

Table 2.1: Abrahamson's (1991) Framework

		Imitation-Focus Dimension	
		Imitation Processes Do Not Impel the Diffusion or Rejection	Imitation Process Impel the Diffusion or Rejection
Outside-Influence Dimension	Organisations Within a Group Determine the Diffusion and Rejection Within This Group	Efficient-Choice	Fad Perspective
	Organisations Outside a Group Determine the Diffusion and Rejection Within This Group	Forced-Selection Perspective	Fashion Perspective

Adapted from Abrahamson (1991, p.591)

The framework contains a dominant perspective (efficient-choice) and three perspectives (forced-selection, fad and fashion). The perspectives indicated when imitation will impel widespread diffusions (rejections) of inefficient (efficient) innovations. Modell (2009) indicated that the efficient-choice perspective which suggests reasons for adoption are cost-benefit-centred decisions comprise fad and fashion perspectives. The forced perspective is driven by the need to comply with regulatory powers (Ibid.).

According to one of the research questions of this study relating to this framework which provides alternative explanations for advanced MAPs adoption or rejections, each perspective is explained in more detail as follows.

➢ *Efficient-choice*

The efficient-choice perspective assumes that agents which are organisations or top management teams have little uncertainty about their goals or preferences, maximise profit, market share growth, competitive advantage or strategic preferences. The ratio of outputs to inputs is efficient innovations measurement (Grandori, 1987). Consequently, the agents choose innovations that are useful for attaining their goals under existing resource constraints.

Within this perspective, environmental uncertainty causes performance gaps – discrepancies between an organisation's goals and the goals that the organisation can attain – across organisations. Organisations that can efficiently close the performance gaps tend to adopt innovations and use similar goals. However, when environmental change renders innovation less efficient in closing organisation's performance gaps, an innovation tends to be rejected.

Perera *et al.* (2003) conducted a longitudinal case study to investigate diffusion of transfer pricing in a government trading enterprise to explain why the transfer pricing was introduced in 1991, abandoned in 1995 and reintroduced in 1998. The study suggested that the role of transfer pricing was used as an accounting mechanism to effect culture and strategic change. The first introduction was rejected because the connotations of intra-organisational separation and competition implicit in transfer pricing were incompatible with the organisational culture. The reintroduction was accepted when the culture had changed – making it consistent with the competitive, market-facing orientation and supporting strategic change.

➢ *Forced-selection*

Assumption of this perspective is that powerful organisations outside a groups (i.e. governmental bodies or labour unions and political pressures) may have an interest in forcing an inefficient innovation to diffuse or an efficient innovation to be rejected.

Therefore, inefficient innovations which receive the backing of powerful organisations outside a group tend to diffuse amongst groups of organisations. However, an efficient innovation tends to be rejected when organisations, outside this group, exert political pressures to reject the innovation. An organisation that has greater power will force other organisations to adopt or reject depending on its preferences which may conflict with lower power organisations.

O'Connor *et al.* (2006) illustrated the intensity of political constraints on labour decision making which negatively mediated the influence of liberalisation forces on China's state-owned enterprises (SOEs) design including performance measurement systems. They conclude that the SOEs had to cope with economic transformation, market liberalisation, political constraints and regulatory conditions.

Li and Tang (2009) explored the design of a performance measurement system (PMS) in a large Chinese state-owned enterprise, focusing on how change happens. The study presented barriers to change which were political constraints and the unavailability of key databases

whereas user participation and embedding existing practice contributed to reducing resistance and promoting continuous improvement PMS.

➢ *Fashion-selection*

This perspective assumes that under conditions of uncertainty concerning environmental forces, goals, and technical efficiency, organisations in a group imitate administrative models promoted by "fashion-setting organisations", i.e. organisations, outside this group such as consulting firms, other expert powers, business mass media and business school (Modell, 2009).

Unlike forced-selection perspective, the fashion setter have no coercive power necessary to force organisations to imitate the innovations. Therefore, inefficient innovations may diffuse amongst organisations when organisations in fashion-setting networks promote them. Fashionable (efficient/inefficient) innovations may decline over time when they fail to fulfil the hopes they generated when organisations adopted them or the use of innovations become routine and boredom may resurface. Organisations will tend to adopt/reject an innovation based on fashion-setting organisations.

Bjørnenak and Mitchell (2002) studied development of ABC literature which had been accumulated in the UK and USA accounting journals during 1987-2000. ABC had been US-based consultant writing in their domestic practitioner journals which had frequently been printed by UK counterparts.

Ax and Bjørnenak (2005) used conference invitations, BSC bestselling books and articles from leading professional journal to indicate how BSC was being adjusted and adopted in Swedish organisations. They indicated that the original BSC package propagated some elements and transformed them into the Swedish BSC package to make it more attractive to a potential Swedish adopter market. Consultancy firms, early adopters and accounting academics introduced the new set of BSC elements to fashion-followers through a reputation organisation for promoting the diffusion of the BSC in Sweden.

Conversely, Sarkis and Setthasakko (2009) conducted a case study in three pulp and paper companies in Thailand to gain an understanding of causes of barriers to development of environmental MA using semi-structured interviews. The study indicated that the main barriers were lack of building organisational learning, a narrow focus on economic performance and absence of guidance on environmental MA.

➢ *Fad-selection*

The fad perspective assumes the diffusion of innovations occurs under conditions of uncertainty; an organisation imitates decision adoption of other organisations within that group. Based on diffusion of innovation theory, the fad perspective focuses on communication of knowledge and social interactions or economic interests. An organisation imitates other organisations' choice of innovation when it obtains from these adopters knowledge that reduces ambiguity about the innovation (Rogers, 2003). Moreover, organisations which imitate innovations aim to appear legitimate by conforming to emergent norms that sanction these innovations and to avoid risks that innovation adopters could gain competitive advantages by using this innovation.

The other organisations' adoption decisions could be either adoption of an inefficient innovation or rejection of an efficient innovation. The propensity of organisations in a group to imitate each other's decisions to adopt or reject an innovation will vary with the nature of pressures promoting imitation and demography of immunities in that group to succumbing to this pressure. For example, high reputation organisations face greater pressure to adopt an innovation to distinguish itself from a low reputation organisation and vice versa.

Zbaracki (1998) introduced a model of the evolving rhetoric and reality of TQM in five organisations using interviews, organisational documents and observation. The results indicated that managers consumed a rhetoric of TQM success; the discourse on TQM developed an overly optimistic view of TQM. A study by Staw and Epstein (2000) investigated effects of TQM on organisational performance, reputation and chief executive officer (CEO) using informational reports. The results indicated that although organisations which were admired tended to be more innovative and pay more to their chief executives when their organisations were associated with TQM trends. The opposite existed when organisations did not have higher organisational performance.

To conclude, the DOI both demand and supply side are employed to explain innovation diffusion. The pro-innovation bias, however, which assumes that the innovation should diffuse amongst potential adopters all the time leads to Abrahamson's (1991) framework. This framework provides a possible explanation for adoption/rejection of innovations such as advanced MAPs (Abrahamson, 1991; Clarke *et al.*, 1999). It also addresses issues not fully covered in earlier diffusion studies and conventional discussions on accounting change (Malmi, 1999). Focusing on MAP diffusions the interview findings of this study were analysed based on Abrahamson's (1991) framework in order to identify reasons for advanced

MAPs diffusion. Some studies (Firth, 1996; Malmi, 1999; Malmi, 2001; Ax and Bjørnenak, 2005; Nassar *et al.*, 2011) on motives for adopting advanced MAPs are as follows:

Efficient-choice

- Existing system not reliable
- Existing system not useful for management
- Performance gaps
- Information system update
- Competitors use an advanced MAP
- Other units of company benefited
- Process organisation requires new accounting

Forced selection

- Parent/headquarters advice
- Pressure from government or other regulatory authorities

Fad and Fashion perspectives

- Wish to try a new tool
- Auditor/consultant advice
- Joint venture with foreign partnership
- Following a reputation organisation
- Learn new techniques from textbook/academic publications/seminars

Moreover, possibilities of advanced MAP namely ABC implementation success could be associated with top management support, the ability of training in implementing ABC and adequate resources (Shields, 1995). Other attributes such as awareness of innovation and attitude formation were identified as motivation adoption factors (Askarany, 2006; Askarany and Yazdifar, 2015).

Conversely, there is justification for rejection of advanced MAPs. For instance, Bjørnenak (1997) indicated that some manufacturing companies in Norway did not adopt ABC because of a lack of ABC knowledge. Nassar *et al.* (2011) determined the motivations for the non-implementation of ABC diffusion in the Jordanian industrial sector as lack of local consultants, high cost of ABC implementation, high cost of consultants, lack of relevant journals, conferences, seminars about ABC in Jordan, lack of accounting bodies, lack of

knowledge for ABC implementation, uncertainty of ABC benefits, and ABC system is too complex. Innes *et al.* (2000) conducted a comparison of 1994 and 1999 mail surveys in the U.K's large companies to examine reasons for adoption or non-adoption ABC. They found that although the number of ABC users had significantly increased from 1994 to 1999 the percentage rejecting it increased slightly. A slight temptation to implement ABC was not suggestive of a strong positive experience with the technique whereas some ABC users expressed positive views on both its importance and success. However, non-ABC users concern with financial benefits outweighed ABC implementation costs, potential complexity and doubts about its technical credibility. Additionally, Al-Omiri and Drury (2007) suggested the possible variables which have been omitted from their study are likely to influence cost system design such as top management support, resistance to change by preparers and users of accounting information, lack of relevant employee skills and the lack of a perceived need by senior managers or the MA function to develop more sophisticated systems. A summary of reasons for rejecting advanced MAPs are:

- Lack of local consultants
- Lack of knowledge
- High cost of implementation/consultants
- Lack of journals, conferences, seminars about advanced MAPs in a country
- Lack of accounting bodies
- Lack of knowledge about implementation
- Uncertainty of the benefits from a new system
- The new system is too complex
- Cost-benefits concern

Interview findings in chapter six were analysed based on four perspectives: efficient-choice, forced, fashion and fad. Within efficient-choice perspective, however, environmental uncertainty causes performance gaps; managers attempt to close the gaps by adopting innovations depending on contingency factors (i.e. market competition, strategies, culture). Modell (2009), Malmi (1999) and Ax and Bjørnenak (2005) suggest that efficient-choice perspective could cover fad, fashion and forced perspectives as cost-benefit-centred decisions. Therefore, there is some overlap between efficient-choice perspective and contingency factors which were tested whether contingency factors impact on MAP adoption in chapter five. Hence, chapter six – interview findings which present views of interviewees related to reasons for adoption/rejection of MAPs will supplement the findings from chapter five and develop further explanation of MAP diffusion using Abrahamson (1991)'s framework.

2.7.3 Organisational Culture

The organisational culture variable employed in phase 1 of this study (questionnaire) was power distance. For phase 2 (interview), the nature of the organisation and perception of the work context were employed, based on the competing values model. The follow sub-section outlines the literature employed for the second phase of the study.

Organisational culture is embedded in design and usage of MAPs (Bhimani, 2003; Henri, 2006); however, empirical evidence which indicates a relationship between organisational culture and MA systems is sparse.

Different definitions of organisational culture have been proposed. For example, Brown (1998, p. 11) stated that

> "…organisational culture is the pattern of beliefs, values and learned ways of coping with experience that have developed during the course of an organisation's history, and which tend to be manifested in its material arrangements and in the behaviours of its members."

Similarly, "organisational culture is taken to refer to the patterns of values and ideas in organisations that shape human behaviour and its artefacts." (Bhimani, 2003).

A set of values which create meaning in organisational settings and cultural artefacts that reflect them could be investigated based on the competing values model (Figure 2.2) which has not been used extensively in accounting studies (Henri, 2006). The model assumes that cultural artefacts such as myths, languages, rituals and symbols are specific to organisations but values which give rise to different organisational culture are common (Quinn and Kimberly, 1984; Bhimani, 2003). Varying emphases on a limited set of values is prevalent within the larger society; this limitation encourages an interest in relationships between national culture and management accounting (Harrison and McKinnon, 1999). Arguably, Bhimani (2003) cited Quinn and Kimberly (1984, p.298) stated that

> "…the competing values model can enable…such things as the means of compliance, motives, leadership, decision-making effectiveness, values and organisational forms…to be explored".

Figure 2.2: The Competing Values Model

EXTERNAL

Developmental   Rational

FLEXIBILITY ————————————————————————— CONTROL

Group   Hierarchical
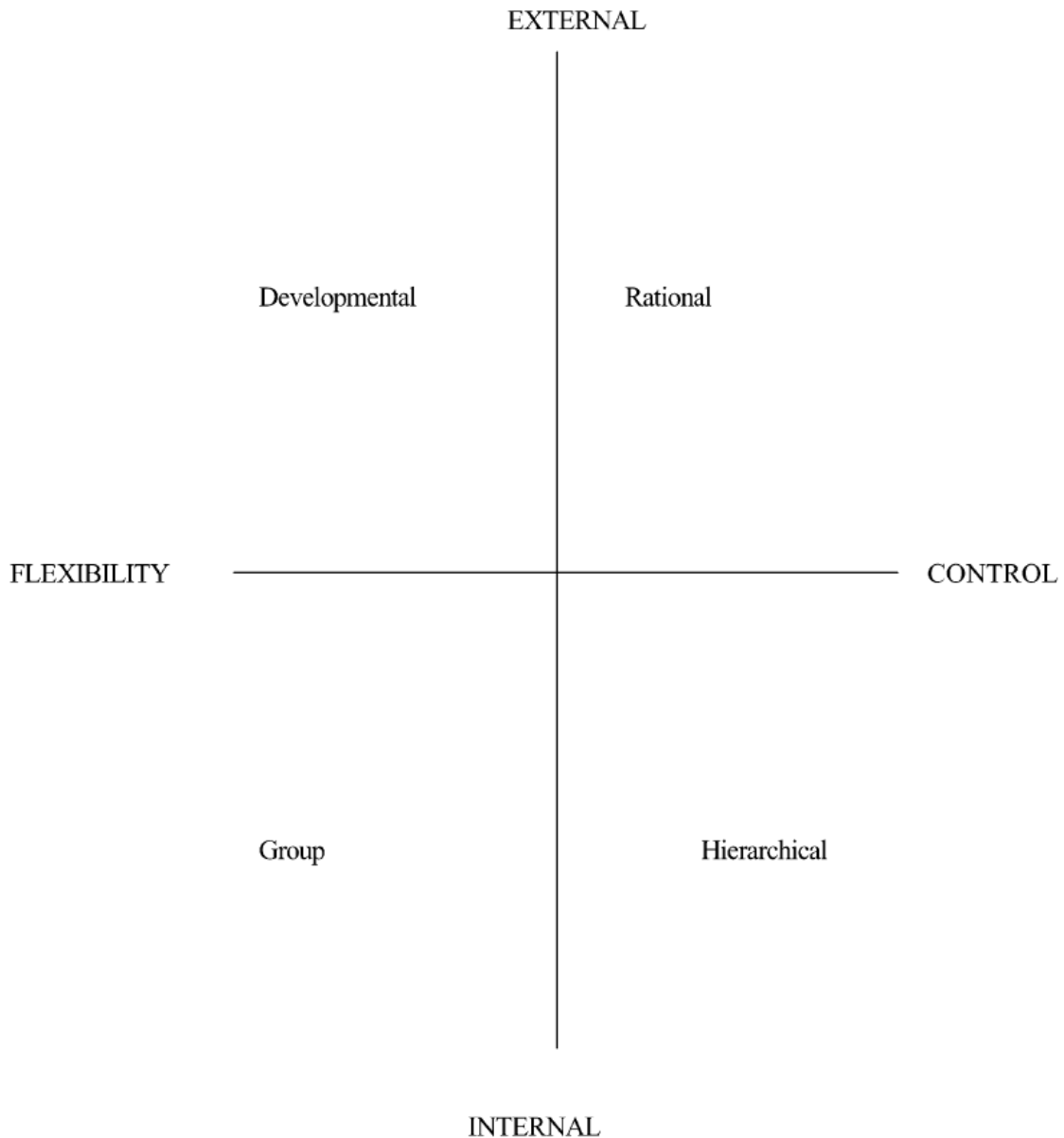
INTERNAL

Adopted from Bhimani (2003)

The competing values model relates to organisation focus in two sets of competing values: control/flexibility dilemma emphasizing stability and change, and internal (people within the organisation)/external organisation dilemma which refers to differences in organisational focus. The model consists of four cultural types of organisational orientations namely group, developmental, hierarchical and rational. First, the "developmental" reflects an orientation toward adaptability and readiness to attain growth, innovation, creativity and an external focus is permeated by assumptions of dynamic change. Second, the "group" orientation is based on norm and values associated with cohesion, teamwork, morale and commitment of human resource development. Third, the "rational" orientation reflects productivity and

efficiency by planning and goal clarity; focusing on achievement and the meritocracy-based belief on individual motivation. Lastly, the "hierarchical" orientation reflects bureaucracy and stability; significance is given to orderly work situations with sufficient co-ordination which is then distributed to organisational participants with enforced roles, rules and regulations. No organisation is likely to adopt only one culture orientation; an organisation may, in fact, contain all four models (Quinn and Kimberly, 1984).

The model is applied in MA studies. Henri (2006) investigated relationships between organisational culture and the nature of performance measurement systems (PMS) use in 1692 Canadian top management teams in manufacturing companies. The findings revealed that top managers of organisations reflecting a flexibility dominant type tend to use a greater PMS to focus organisational attention, support strategic decision-making and legitimate actions than top managers of organisations reflecting a control dominant type.

Moreover, Bhimani (2003) conducted a case study within a company called Siemens an electronics and electrical components industry, using interviews, questionnaire and internal documents. The study investigated how certain notional organisational cultural elements became embedded in the design of innovative MA systems – TC – and how users influenced the perceived success of the new system. The findings indicated that organisational culture elements were embedded within the MAS and the organizational outlook of the two user groups – functional expertise in engineering and business economics – significantly influenced the system's perceived success.

Conversely, researchers had explored the association between MA and organisational culture using a variety of measurements i.e. practices-based measures (Hofstede *et al.*, 1990) and questions developed by (Reynolds, 1986).

 Baird *et al.* (2004) examined the relationship between ABC adoption and organisational culture in 400 Australian business units using mail survey questionnaires. The findings indicated that business units with a tight control culture which were extremely cost conscious, involved extensive and continuous flows of information, and extremely detailed planning, budgeting and reporting systems were more likely to adopt ABC than those with loose control cultures.

Reynolds (1986) conducted a study using 14 cultural dimensions derived from the dimensions most commonly used in the organisational culture literature within U.S. organisations across three industries: restaurants, computer software and advanced technology industrial firms.

The findings indicated that different employee positions within the same organisation held different cultures; no relationship was found between measurement of culture and classification of organisation (i.e. competing organisation).

Liu (2002) conducted case studies in the UK organisations to explore development and implementation of ABB. One of the findings indicated that the success of an ABB implementation is the organisational culture (a set of norms). Organisational restructuring which destabilises the existing culture may have some positive impact on the ABB implementation.

As mentioned earlier, organisational culture has an explicit influence on MA systems. Different job positions in an organisation held different cultural values (Reynolds, 1986). There is a relationship between organisational culture and MA system adoption (Bhimani, 2003; Baird *et al.*, 2004; Henri, 2006). Hence, it is worthwhile to extend a study of the relationship between organisational culture elements (flexibility dominant or control dominant) and the adoption of MAPs.

2.8 Conclusion

This chapter provides a wide scope which includes MA changes across countries, the possible factors that would impact on MAP adoption and the possibility of the interaction effects of MAP adoption and IIS implementation on organisational performance (including financial- and non-financial performance). These are analysed based on contingency theory. However, due to the research objective of this study – to identify influencing factors of adoption/not adoption of MAPs only two of five dimensions (additional and replacement) of MA changes have been addressed, regarding Sulaiman and Mitchell (2005). Moreover, an explanation of reasons that cause MAP changes using DOI to answer "why" MAPs has been adopted/rejected including understanding the potential facilitators/barriers to change. Finally, this chapter reviews the competing values model which measures elements of organisational culture that may link to the perceived success of advanced MAP adoption.

Aforementioned, research framework (Figure 2.3) based on two theories: contingency theory and DOI are employed in this study. The impacts of contingent factors on individual MAP adoption were tested by congruence approach whereas the interaction effects between MAP adoption and IIS implementation on organisational performance (financial and non-financial) were analysed based on contingency approach. The differences between those two approaches provide in section 2.4.1. The DOI theory (section 2.7) underpinned case studies to explain "why" advanced MAP have been adopted or rejected.

Research methodology will follow in the next chapter.

Figure 2.3: Research Framework
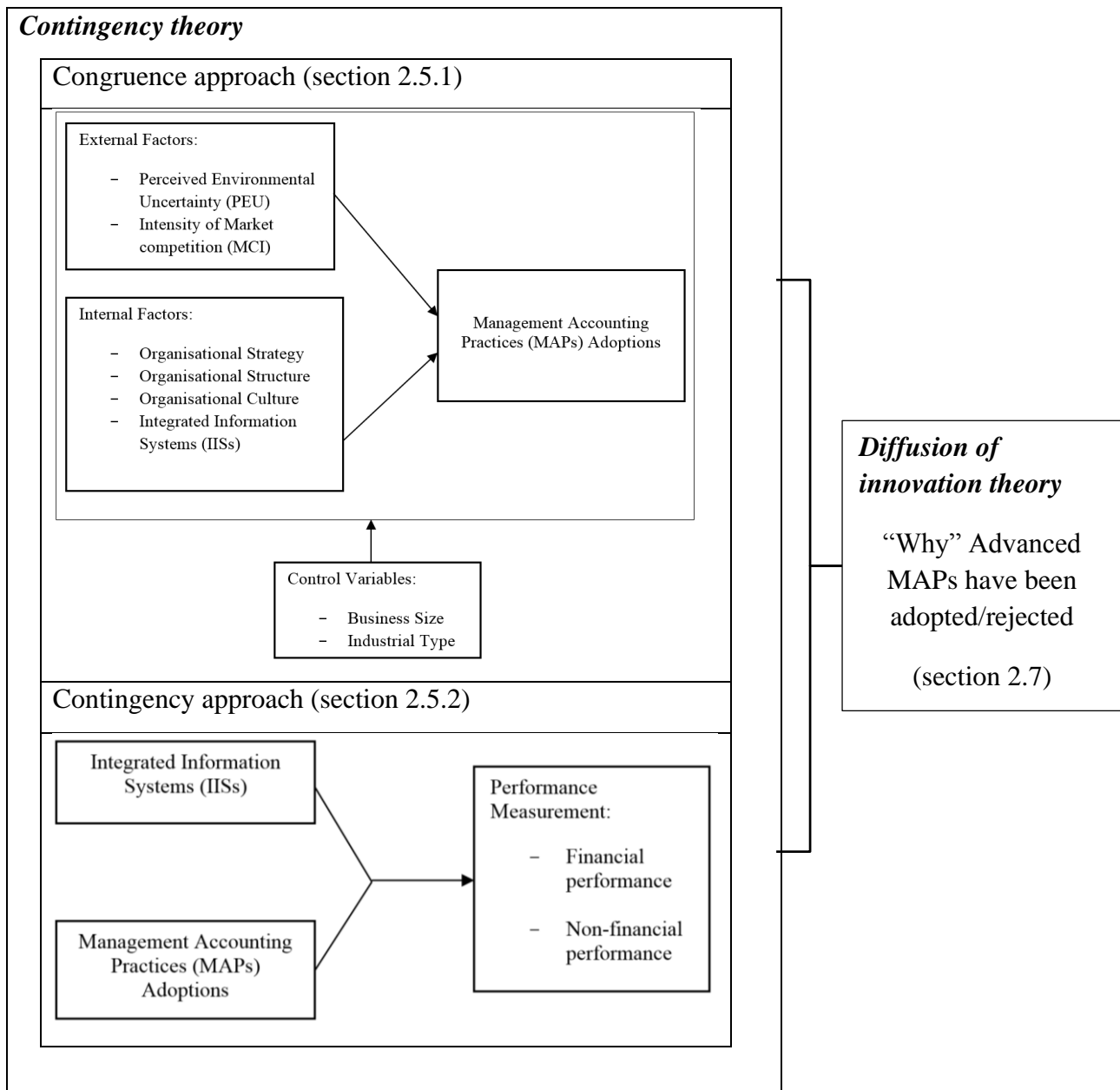
Chapter 3. Research Methodology

3.1 Introduction

This chapter aims to provide the research philosophy, methodology descriptions and data collection procedures used in this study. The chapter begins with a description of the research philosophy and methodology assumptions. The reasons for choosing pragmatic and mix methods (questionnaires and semi-structure interviews) are also discussed. This is then followed by an explanation of the research design and data collection methods. The evaluation of reliability and validity of data then follows. Finally, a discussion of the statistical methods used in data analysis and the ethical issues relevant to this study are presented.

3.2 Research Philosophy

Research philosophy guides development of knowledge and the nature of that knowledge in relation to the research process (Saunders *et al.*, 2012). There are assumptions which underpin the research strategy (methodology) and the research methods chosen by a researcher as part of that strategy in every stage of a research effort (Crotty, 1998; Creswell, 2014). Easterby-Smith *et al.* (2012) mention that researchers have to understand philosophical research because of at least three reasons: 1) helping to clarify research design, 2) helping to recognise which design best applies to a research effort, 3) helping to identify and create designs that may be outside the researcher's experience. Researchers should therefore have a clear understanding of research philosophy to provide a guide for research design at all stages (Creswell, 2014).

A particular research question can rarely be answered only within one philosophical domain (Saunders *et al.*, 2012). Any research is based on philosophical assumptions about the nature of reality or what can be said to exist that is ontology and what constitutes acceptable knowledge or epistemology (Ibid.). In other words, ontology focuses on questions related to what is an existing reality whereas epistemology explains how/what researchers know through facts/experience or knowledge (Crotty, 1998). These general philosophical orientations lead to embracing a qualitative, quantitative or mixed methods approach in a research effort.

There are four main research philosophies or paradigms suggested by Creswell (2014) as 1) postpositivism, 2) interpretive/constructivism, 3) transformative and 4) pragmatism. Firstly, postpositivist philosophy underpins quantitative research; determine causes of outcomes or objective knowledge verification; reductionistic in that intent is to use deduced logic developed hypotheses and models; and theory verification needs to be investigated. Its aim is

to develop universal causal laws through testing theories. Secondly, interpretive/constructivism is associated with qualitative research to provide an ability to look at change interaction processes amongst individuals over time. This approach is often subjective meaning it focuses on specific context such as common behaviours and historical experiences. Rather than starting with a theory as in postpositivism, a theory is developed inductively. Thirdly, the transformative approach assumes that inquirers who need to go further than the constructivist stance will proceed collaboratively, participants may be part of a research process including design questions, data collection and analysis of information. These approaches centre on diverse groups such as inequities based on gender, race, ethnicity, sexual orientation and links political and social action to these inequities. Lastly, pragmatism applies to mixed methods research engaged with both quantitative (postpositivist) research and qualitative (constructivism) research. The pragmatism method has a real-world practice orientation. Researchers have a freedom of choice for choosing methods, techniques and analysing data. In social, historical, political and other contexts, pragmatism (mixed method) opens the door for researchers to address "what and how" of a research problem on the intended consequences.

The choices of theoretical aspects of research methodologies have been suggested by some scholars. For example, Saunders *et al.* (2012) suggest that if researchers adopt the philosophical stance of the natural scientist, the research might reflect the philosophy of postpositivism which involves an objective aspect. The interpretivism paradigm or qualitative paradigm is appropriate for an expectation to gain an interpretive understanding of social complexity phenomena based on the key idea that seek to describe, translate, explain the meaning, without the frequency of occurring phenomena in the social world, and is not derived from the statistical analysis of quantitative data (Collis and Hussey, 2009, p. 57). Wilson (2014) stated that if researchers consider a more "creative, hand-on", interpretivism is suited to the way of thinking whereas if accurately measuring information, and taking a non-participatory role then a postpositivist stance may be considered. However, if one position might be more appropriate than another for answering a particular research question, or if a research question does not suggest a particular research approach, Saunders *et al.* (2012, p. 130) indicate that pragmatism is perfectly possible to be adopted because the pragmatists recognise that there are different ways of interpreting and undertaking research to enable credible, reliable and relevant data to be collected. In reality, proposed research questions are a major factor that researchers have to take into account (Wilson, 2014).

Collis and Hussey (2009) indicate that research design plays a major role on the whole research design which requires a determination of philosophical research. As highlighted in the literature review chapter, there are multiple contingency factors that impact on the subject matter. This study assumes social factors such as environmental uncertainty and market competition intensity exist in reality and aim to constitute valid knowledge about causal relationships amongst variables through a contingency theory (postpositivism) as well as investigates MAP changes over a decade (constructivism). Because, research questions of this study cannot fit into only one paradigm (either postpostitivism or constructivism), the pragmatism paradigm was employed as suggested by (Saunders *et al.*, 2012) to maximise advantages and minimise disadvantages of either the quantitative or the qualitative method. The next section takes the discussion of methodology further by explaining the difference between quantitative, qualitative and mixed methods.

3.3 Differences between Quantitative, Qualitative and Mixed Methods

A crucial question in assessing a method/methods is whether an appropriate research method has been chosen given the research question proposed (Abernethy *et al.*, 1999). To answer research questions, this study conducted under the pragmatism which opens the door to mixed methods studies using multiple methods, exploring different worldviews and employing different forms of data collection and analysis (Creswell, 2014, p. 11).

The mixed methods study make it possible to combine adjacent quantitative and qualitative; it has potential to throw new perspectives on research questions and provide deeper insights that explain why things have taken place (Easterby-Smith *et al.*, 2012). Nevertheless, Leedy and Ormrod (2010) stated that "quantitative research is used to answer questions about relationships among measured variables with the purpose of explaining, predicting, and controlling phenomena….qualitative research is typically used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants 'point of view.". The mixed methods provide direction for procedures in a research design.

Choices for choosing mixed methods depend on expected outcomes which link to recommend mixed methods design (Creswell, 2014, p. 231). There are three basic recommended mixed methods designs classified by data collection sequence. First, a convergent parallel mixed methods design in which both quantitative and qualitative data collection are conducted at the same time is used to compare different perspectives drawn from quantitative and qualitative data and expect for a merging of the two databases to show how the data convergent or

diverge. Second, an explanatory sequential mixed methods design in which quantitative data collection and analysis is followed up with qualitative data collection and analysis is for explaining quantitative results with qualitative data. A more in-depth understanding of the quantitative results (often cultural relevance) is expected of the outcomes. Lastly, an exploratory sequential mixed methods design in which qualitative data collection and analysis builds to quantitative data collection and analysis is for developing better measurement instruments which provide a test of better measures of outcomes for a sample of a population.

Alternative research designs which over decades have been the most common employed in management accounting studies are experimental design and nonexperimental design namely surveys (quantitative methods) and case studies (qualitative methods) (Birnberg *et al.*, 1990; Abernethy *et al.*, 1999; Chenhall and Smith, 2011). Experimental method is a natural science which sets about the research process in a systematic way and experimental studies allow causal relationships to be identified (Wilson, 2014, p. 303). An experimental research is classified by two criteria (Creswell, 2014). First, a selecting sample size method includes true experiments, with the random assignment of subjects to treatment conditions, and quasi-experiments that use nonrandomised assignments. Second, a simulated setting comprises field experiment and laboratory experiment. The field experiments enable the experimenter to create contrived situations whereas the laboratory enables the experimenter to measure behaviour with greater precision. However, the experimental methods often involve volunteers or members of the business community so an ethical issue needs to be considered (Coombes, 2001). Hoque (2014) explains that most of the experimental method studies published in accounting journals in 1992-2011 were carried out with volunteers like MBA students or recently graduated students. A strength of the laboratory experiments is a high degree of control which allow a researcher to exclude variables that are not a focus of the study. However, results from the experiments are artificial and make a variety of abstractions because the methods are based on volunteer or other convenience samples (Birnberg *et al.*, 1990). Abernethy *et al.* (1999) also state that

> "…some experimenters ignore the predisposition of many accounting researchers that laboratory experiments are weak substitutes for quasi-experiments that use 'hard' archival data…"

Therefore, causal tests of theories when a natural environment is very complex are prone to render the experimental method less valid for any natural world conclusions.

Other commonly adopted research methods in management accounting studies are survey and case studies, which have different assumptions. The survey method as a component of the quantitative approach has been widely used in management accounting research (Young, 1996). It provides a numeric description of trends, attitudes, or opinions of a population by studying a sample of that population using questionnaires or structured interviews for data collection (Creswell, 2014). An advantage of this approach is the survey's capacity for generating primary data on a wider population to test theories or hypotheses (Bryman, 1988, p. 11). Surveys are the most heavily employed by management accounting researchers (Van der Stede *et al.*, 2005; Chenhall and Smith, 2011). Van der Stede *et al.* (2005) conduct a survey tracing the five key elements of innovation in management accounting practice to research the quality of surveys in the field and conclude that field research has been exceptionally valuable at producing "usable knowledge" as compared to other research methods over a 20-year period (1982-2001) (Anderson and Widener, 2007). Drury and Tayles (1995) argued that questionnaire surveys provide a broad overview of existing practice and identify ambiguous areas that required more explanation. Lillis and Mundy (2005) refer to Gosselin (1997) and Kennedy and Affleck-Graves (2001) studies that investigated out performance of ABC firms compared with non-ABC firms. They conclude that the findings accentuate a still unresolved paradox, why do firms implement or stop using ABC. They then suggest further field study research[18] (Ibid.).

Case studies are a qualitative research method which offer a researcher an in-depth analysis of particular events, activity, process, or one or more individuals (Creswell, 2014; Wilson, 2014, pp. 107-110). The case studies in management accounting provide an in-depth knowledge description of practice, testing a theory developed and development of a theory (Llewellyn, 1992; Atkinson and Shaffir, 1998; Parker, 2012). Otley and Berry (1994) suggested that the case study method is useful in a wide variety of contexts. There is an increasing trend of MAPs case studies being published in many accounting journals (Chenhall and Smith, 2011; Hoque, 2014). A case study allows a researcher to address fundamental or practical problems over a certain period within a natural setting and enables the researcher to answer "how" or "why" questions (Coombes, 2001, p. 44; Yin, 2014). However, there are some drawbacks with the case study approach as mentioned by Otley and Berry (1994) and Yin (2014). A case study conducted in one organisation is not intended to represent an area of study with respect to exploring a whole population. In the social reality, researchers cannot be an independent

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[18] According to Anderson and Widener (2007, p. 231), "field research is portrayed as improving upon case study research because of the opportunity to consider firm-level variation and to generalize results (albeit in a limited statistical sense) to more than one firm."

observer therefore the interpretation raises a possibility of bias. Finally, the case study approach may require an extensive amount of data to achieve analysis of a case; this will be a time consuming exercise.

Creswell (2014) and Wilson (2014) highlight that a mixed methods study is a pragmatic research philosophy which focuses on research problems and research questions at the centre of the research and researchers are likely to adopt multi-strategy research: qualitative and/or quantitative strategy. Creswell and Clark (2011) define a mixed-method design as "those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of method is inherently linked to any particular inquiry paradigm." The mixed methods provide an ability to present a greater diversity of views, stronger inferences, uncover deviant dimensions, synthesis and integration of theories, and stimulate creative and inventive methods (Easterby-Smith *et al.*, 2012, p. 63). However, this method requires more resources than single method studies (Ibid.). Mixed methods, combining qualitative and quantitative approaches, has increasingly grown in use in management accounting literature (Modell, 2005; Anderson and Widener, 2007). Modell (2010) suggest that an explanatory design[19] which is one of the mixed methods designs[20] combined survey with semi-structured interviews enhances predictive capacity across a research setting using multiple theories. Since survey findings offered conclusive support as a weakness, interview evidence used as a complement to quantitative data adds authority to the findings (Modell, 2005; Modell, 2009; Modell, 2010). For example, Ittner *et al.* (2003) examine how different types of performance measures are weighted in a subjective BSC plan using quantitative methods (internal documents and employee survey) and qualitative methods (interview and observation). They have found subjectivity allowed supervisors to reduce bonus by placing more financial weights, changing evaluation criteria and ignoring measures not predictive of results. O'Connor *et al.* (2011) used mixed methods (survey, archival data and interviews) to investigate the relationship between competitive forces and the importance firms place on their MCS practices and whether the firm's international market orientation moderates this relationship. A positive association between competitive forces and the importance that firms place on their MCS had been found. The findings from

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[19] The explanatory sequential design or the explanatory design is a design which starts with quantitative data collection and analysis which has the priority for addressing the study's questions. This first phase is followed by the qualitative data which is designed from the results of the quantitative phase. The explanatory design aims to explain the initial quantitative results supported by qualitative results. It is the most straightforward of the mixed methods designs with a strong quantitative orientation (Creswell and Clark, 2011, pp. 81-85)

[20] Creswell and Clark (2011) suggested four basic mixed methods designs: the convergent parallel design, the explanatory sequential design, the exploratory sequential design and the embedded design. Selecting a suitable design is based on the research problems and reasons for using the mixed methods to ensure that the resulting design is rigorous, persuasive and of high quality.

in-depth interviews indicated that competitive forces could be evidenced by factors that were associated with a threat of foreign entrants and buyers' bargaining power. An example of those factors are cost pressure, budgeting/imitation of foreign entrants, hiring terms and conditions, brand image pressure, formal contractual demands, profit margin pressure, formal monitoring, warranty risk, and exporting costs. Therefore, mixed methods make i.e. probe deeper into a researchers' empirical findings using qualitative methods.

The foregoing discussion has highlighted the strengths in both survey and case study methods. This study employed a mixed method approach including both survey and case studies. The rationale behind choosing the mixed methods, explanatory sequential design, to achieve the research objectives of this study is outlined as follows:

- To examine the current state of MAPs in Thai companies, to investigate relationships between influencing factors including IIS implementation and MAP adoption, and to identify the interaction effects of MAP adoption and IIS implementations on organisational performance, the survey approach was an appropriate tool (Collis and Hussey, 2009; Saunders *et al.*, 2012).
- To identify underlying reasons for MAP adoption, case studies are a beneficial strategy to gain in-depth detailed descriptions of MAP changes and IIS diffusion that complement information obtained from the survey (Modell, 2010; Easterby-Smith *et al.*, 2012; Yin, 2014).

In addition, examining linkages between contingent variables, testing hypotheses and finding answers for "what" and "why" questions, this research employed the pragmatism paradigm, predominantly conducted questionnaire surveys and supplemented with the multi-case study based on the survey of respondents.

3.4 Advantages and Limitations of Survey and Interviews

To answer research questions and achieve the research objectives, this study employed two methods, a questionnaire survey and multi-case studies using interviews.

3.4.1 Survey

Questionnaires can be classified by distribution methods[21]. This study involved internet/online questionnaires and email questionnaires, followed up by telephone surveys. There are advantages and limitations of those methods examined as follows

Within the internet worldwide, electronic distribution methods have been chosen. Internet questionnaires are a survey conducted by sending an electronic questionnaire to the respondents or sending a web address as a web-based survey. Saunders *et al.* (2012, pp. 420-421) indicated that internet questionnaires delivered in conjunction with email offer greater control because most people read and respond to their own email. Email questionnaires arouse curiosity of the respondents as they are more likely to answer by opening their own email and preparing to interact (Wilson, 2014, p. 157). Interactive benefits are obtained from internet-based survey such as extra explanation using pop-up instruction or drop-down boxes, skip not relevant topics based on answers to earlier questions using skip-logic, dynamic error-checking of answers (Easterby-Smith *et al.*, 2012, pp. 230-231). A Web-based survey also permits directly downloading data into an analysis programme such as Excel and SPSS to avoid data entry error. These methods also help researchers to eliminate cost of paper (i.e. postal questionnaires), postage reduce delivery and response times.

However, there are limitations to internet questionnaires. Researchers have to make sure that email addresses of expected recipients are correct to avoid a high failure response. Email traffic must be taken into account so subject box is a tool to avoid an email being sent into a junk mail (Wilson, 2014, p. 158). In general, a poor questionnaire design might lead to faulty responses by respondents. Saunders *et al.* (2012, p. 419) suggested that a clear layout of questionnaires including explaining the purpose of the questionnaire, pilot testing, and planned and executed delivery and return of completed questionnaires can increase response rates.

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[21] For example, on-line, post or mail, telephone and individual distribution or self-administered which is a questionnaire distributed by a researcher himself/herself, explaining the research purpose to the respondents then comeback for collecting the completed questionnaire (Oppenheim, 1992)

3.4.2 Interviews

An interview is one of the data collection methods which has been commonly used in doing case studies[22]. Interviews have strengths and weaknesses.

Interviews can help researchers gather valid and reliable data relevant to research questions and objectives to explore and understand research issues (Saunders *et al.*, 2012, pp. 372-373). Yin (2014) noted that interviews are useful by being targeted and insightful. This method focuses directly on the "why" question in actual conversation to know "why" a particular process occurred and provides perceived causal inferences and explanations. Non-verbal clues of interviewees such as the inflection of the voice and facial expressions can be used to develop further questions (Easterby-Smith *et al.*, 2012, p. 128). Confidentiality is another advantage the interview provides. Semi-structured and unstructured interview questions often an opportunity for interviewees to reply, are more personal in nature whereas structured interviews give a high degree of standardisation of questions and answers (Ibid.).

Nevertheless, the limitation of interviews are bias of data collection (Coombes, 2001, p. 44; Saunders *et al.*, 2012, pp. 381-382; Yin, 2014, p. 102). An interviewer bias can happen when comments, tone or non-verbal behaviour of the interviewer cause the interviewee to respond in a particular manner to the questions being asked. An interviewee or response bias may be caused by perception of interviewees of interviewers or in relation to perceived interviewer bias. A participant bias may result from the nature of the individuals or organisational participants. This is an issue when interview-time is limited, interviewers may reduce a willingness to take part in the interview process. In addition, interviewees might give what interviewers want to hear to enhance interviewer's satisfaction and finish the interview process.

This study is aware of an issue regarding theoretical saturation (Bowen, 2008) which is continuing sampling and analysing data until no new data appear (Bryman and Bell, 2011, p. 432). There is a potential for bias though the selection of interview participants and an issue of assuming that the views of a respondent are representative of the organisation.

As stated, there are advantages and disadvantages of the internet questionnaire survey and interviews. This study chose semi-structured interviews as a supplement to the questionnaires. Results from questionnaires were used as guidance notes or protocol to provide the structure for the interview conversation. The semi-structured interviews were conducted to describe

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[22] There are six sources of evidence used in doing case studies: documentation, archival records, interviews, direct observations, participant-observation, and physical artefacts (Yin, 2014).

and explore reasons an organisation has/has not adopted MAPs and IISs from top-manager perspectives. The interviews conducted with some survey respondents were based on willingness and variety of business types. A broad theme of antecedents to management accounting changes and synergy between management accounting and integrated information system were included on interview questions for each interviewees in order to overcome bias based on theoretical saturation.

3.5 Choice of Research Method

A "good" case study is likely developed from several sources of data or information (Yin, 2014). In addition, a survey is usually suitable for explanatory research (Saunders *et al.*, 2012). This study adopted a survey including an online-questionnaire and a self-administered questionnaire[23] and interviews for data collection methods to achieve the three main objectives of the research which are reiterated as follows;

1. Explore the current state of MAPs in Thai companies;
2. Identify the reasons and factors which motivated/prevented the adoption of MAPs in Thai companies;
3. Evaluate the impact on organisational performance of the adoption of MAPs, IISs and their interaction effect

This study was conducted in two phases. An online questionnaire was used in the first phase, mainly aiming to explore the current state of adoption of MAPs, contingent factors and organisational performance in order to address the first and the third objectives. The reasons for this phase are MAP adoption data needed for this research were not available from archival sources. Although organisational performance return-on-assets data of firms was available from archival sources, collected information directly from firms was a test for a large number of firms. In the second phase, interviews and a self-administered questionnaire were employed, mainly to address the second objective and supplement quantitative findings. The self-administered questionnaires were an organisational culture measurement for further investigation. Interviewees from organisations who had participated in the initial phase were interviewed to gather in-depth views of business practices about whether or not factors that had been found in the online survey influence diffusions of MAPs. Moreover, self-administered questionnaires were also conducted in the second phase. A set of culture

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[23] A self-administered questionnaire is a data collection technique in which each respondent reads and answers the same set of questions in a predetermined order without an interviewer being present (Saunders *et al.,* 2012, p.681).

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perspectives[24] was sent to interviewees prior to the meeting. The completed culture questionnaires were returned at the end of the interview meeting. These enhance respondent participation (Saunders *et al.*, 2012, p. 421).

Hence, mixed methods were used for data collection. The data related to changes of MAPs, influencing factors on MAP adoption, and organisational performance were examined by online questionnaires. The reasons for diffusions of MAPs were investigated by interviews.

3.6 Research Design and Data Collection

Research design is a preliminary research plan including the methods of data collection to make the drawing of conclusions valid (Oppenheim, 2000, p. 6). The research design in this study (Figure 3.1) begins with a literature review to evaluate existing knowledge related to research topics which are MAPs changes, factors associated with MAP adoption, and the interaction effect of MAP adoption and IIS implementations on organisational performance across countries. Second, a knowledge gap in the literature review was developed in order to clarify research objectives and research questions, followed by eclectic conceptual framework. Next, a mixed method – explanatory design was conducted by carrying out the quantitative method using questionnaire and semi-structured interviews. Data collection which employed the survey and the interviews contained a series of steps: 1) collecting questionnaire data, 2) analysing the quantitative data from those collected questionnaires to answer quantitative research questions, 3) designing qualitative questions based on quantitative results, 4) conducting case studies using interviews, 5) analysing interview data in order to answer qualitative research questions and 6) interpreting how the connected results answer all research questions and reaching a conclusion.

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[24] Questionnaire findings indicated there are significant negative impacts of organisational culture on almost all selected MAPs and the organisational culture became embedded in the design of MA systems (Liu, 2002; Bhimani, 2003; Henri, 2006). Therefore, this study conducted an additional culture questionnaire during the interview processes to gain additional explanation.

Figure 3.1: Research Design

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┌─────────────────────────────────────────────────┐
│         1.  Literature review                   │◄──┐
└─────────────────────────────────────────────────┘   │
              ▲                                        │
              ▼                                        │
┌─────────────────────────────────────────────────┐◄──┤
│   2. Research objectives and Research questions │◄──┤
└─────────────────────────────────────────────────┘◄──┤
              ▲                                        │
              ▼                                        │
┌─────────────────────────────────────────────────┐   │
│         3. Eclectic conceptual framework        │◄──┤
└─────────────────────────────────────────────────┘   │
              ▲                                        │
              ▼                                        │
┌─────────────────────────────────────────────────┐   │
│         4. Mixed method case study              │◄──┤
└─────────────────────────────────────────────────┘   │
              ▲                                        │
              ▼                                        │
┌─────────────────────────────────────────────────┐   │
│         5. Quantitative research (survey)       │◄──┤
└─────────────────────────────────────────────────┘   │
              ▲                                        │
              ▼                                        │
┌─────────────────────────────────────────────────┐   │
│ 6. Qualitative research (semi-structured         │◄──┤
│    interviews) and a self-administered           │   │
│    questionnaire                                 │   │
└─────────────────────────────────────────────────┘   │
              ▲                                        │
              ▼                                        │
┌─────────────────────────────────────────────────┐   │
│         7. Inference/Conclusion                 │◄──┘
└─────────────────────────────────────────────────┘
```
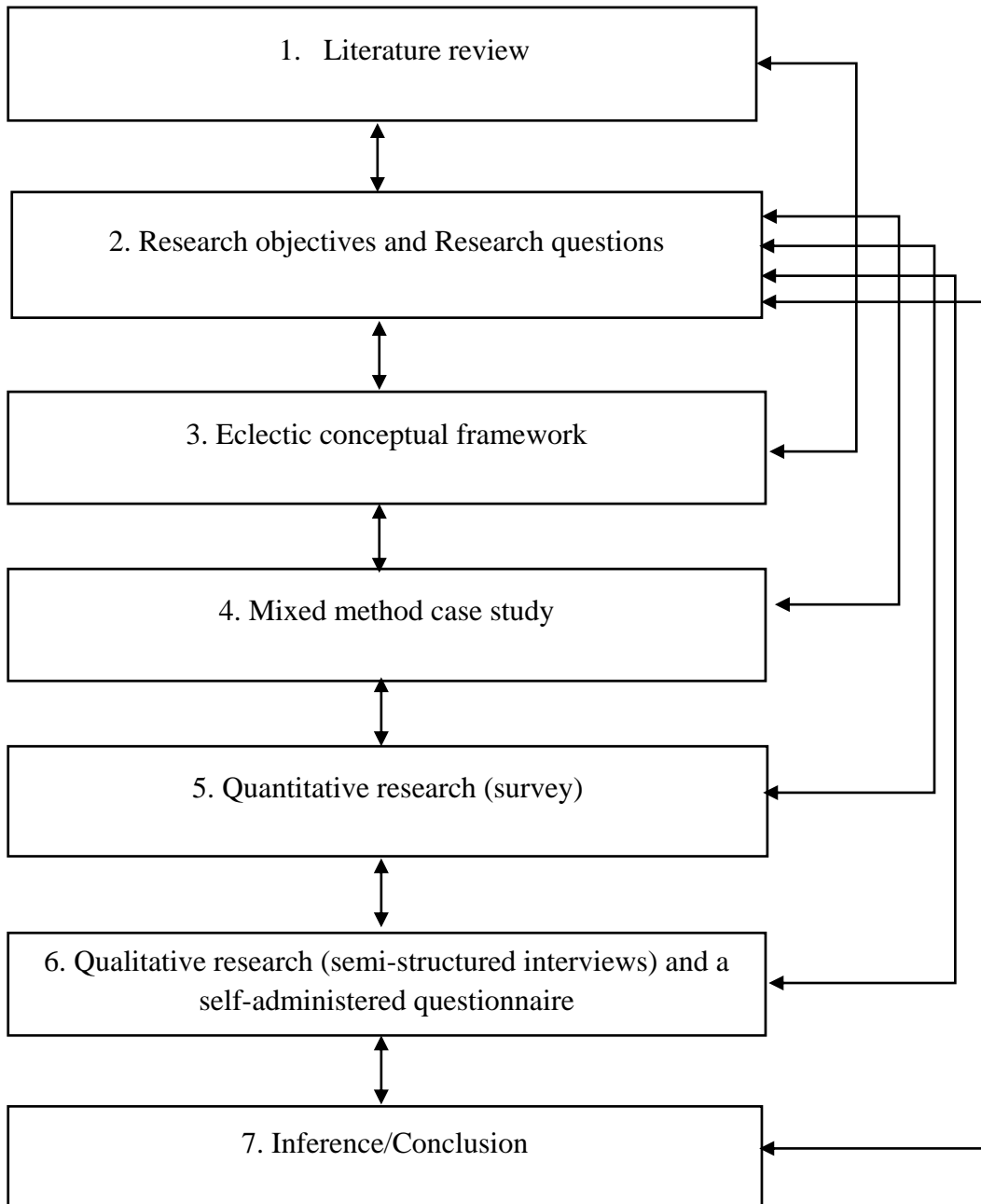
The next section presents the data collection methods including questionnaires and interviews, sample size and the data collection procedures.

3.6.1 Quantitative Design

Over the last ten years, survey research published in top accounting journals showed some failure to follow well-established survey procedures which may include an examination of non-response bias and inadequate sample size (Young, 1996). Van der Stede *et al.* (2006) argued that the quality of survey research in MA has improved over time. In particular, they study (1982-2001) the survey research published in eight accounting journals over the last 20 years which used five key elements of a well-designed survey. The five categories are purpose and design of the survey, population definition and sampling, survey questions and other research method issues, accuracy of data entry, and disclosure and reporting (Van der Stede *et al.*, 2006; Diamond, 2011). Using this framework, there are some issues to be considered.

- Questionnaire design
- Survey population, response rate, and sample size
- Pre-test procedures, follow-up procedures, non-response bias, and types of dependent measures
- Reliability of data
- Describing research procedures and data collection

These elements were used as a guideline to improve the quality of survey used in this study.

Internet-based questionnaires containing a five-point scale were employed in this study. The five-point scale was considered as adequate for data collection using a questionnaire, an increasing point of scale such as seven-point or nine-point does not improve reliability of the rating (Sekaran, 2013; Wilson, 2014, p. 155). Therefore, most questions on the questionnaires of this study used a five-point scale except general questions such as respondents' backgrounds and business type. Additionally, designing a questionnaire may have some requirements mentioned by Oppenheim (2000), Collis and Hussey (2009), Hair (2011) and Saunders *et al.* (2012) as follows;

- Using clearly worded questions, avoid words that have more than one meaning and using generally understood terms to increase validity of questionnaires
- Using consistency in layout and style of each section with a logical sequence to encourage participants and foster more confidence to answer

- Using closed-end questions[25] including an option "other (please specify)" in long and comprehensive questionnaires may lead to easy and quick answer for respondents

As stated, a questionnaire was designed including attention to layout and clear content (Appendix C-D). The questionnaires were translated into the Thai language. Each respondent was given a glossary of MAPs terms used in the questionnaire to avoid any misunderstanding and bias of response (Appendix E). All respondents were asked to indicate which MAPs are in use and degree of perceived benefits of MAPs using a five-point scale. The questionnaire used a total of fifty-seven MAPs; some MAPs were used in previous studies (Appendix A). To ensure comparability of results the questionnaire was sent to the same groups of listed companies in SET as those in two previous studies (Appendix B for the demographic data comparison).

> ### *Content and Sources of the Questionnaire*

Questionnaires were used in the second phase of this study. In the first phase, on-line questionnaires were distributed to and collected data from sample companies that listed on the SET. The on-line questionnaires were designed to collect information such as organisational performance, usage of MAPs in Thai companies, contingent factors including PEU, MCI, organisational strategy, organisational structure, organisational culture, and IIS implementation. The second phase employed a self-administered questionnaire which was distributed to interviewees who participated during case studies. The self-administered questionnaires aim to collect in-depth information based on organisational culture perspective.

At the first phase, the final version of a questionnaire was used after revision based on feedback and recommendations from a pilot study. The questionnaire package consisted of a cover letter and seven sections (Appendix C). Content of the questionnaire and sources of construct present are as follow;

- Section 1: Organisational and personal backgrounds

General questions of respondents such as job position, experience and education background were collected in part 1.1 whereas part 1.2 consists of organisational background – industrial

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[25] There are six types of closed questions – 1) list (a response is offered a list of items, any of which can be selected), 2) category (only one can be selected from a given set of categories), 3) ranking (a response is asked to order answers), 4) scale (a rating instrument is used to record respondent's opinion), 5) quantity (a respondent is asked to give the amount or number), and 6) grid (more than two questions can be recorded using the same matrix) (Saunders *et al.,* 2012).

type, nationality of organisation and Chief Executive Officer (CEO), total assets, number of employees and net sales.

This section was adapted from Luther and Longden (2001) and Nimtrakoon (2009).

- Section 2: MAPs diffusion

This section was designed to collect information related to current MAPs which is used in Thai companies and the degree of perceived satisfaction from those MAPs using a five-point scale rating from 1 (extremely dissatisfied) to 5 (extremely satisfied). If a MAP was not currently used, the respondents were asked to leave blank answer.

The list of 57 MAP were adapted from Chenhall and Langfield-Smith (1998), Wijewardena and De Zoysa (1999), Joshi (2001), Phadoongsitthi (2003), Hyvönen (2005), Nimtrakoon (2009).

- Section 3: Organisational Structure and Organisational Culture

This section was designed to measure ST (decentralisation and formalisation) and CUL (power distance) based on 16 items. The respondents were asked to indicate on a five-point Likert scale (1 – strongly disagree to 5 – strongly agree) the extent to which response in each item applied to the respondent's firm.

The questions were adapted from previous studies such as Gosselin (1997), Lee and Yang (2011), Nicolaou (2000), O'Connor (1995) and Dent (1991).

- Section 4: Organisational Strategy

SG was measured in this section. The respondents were asked for their opinion in determining which provided description of SG describe the best fit to their organisation based on a five-point scale (1 - strongly disagree to 5 - strongly agree).

The questions were developed by Abernethy and Guthrie (1994), Chong and Chong (1997) and Hoque (2004).

- Section 5: Perceived Environmental Uncertainty and the Market Competition Intensity

The level of PEU and MCI in the respondent's firm were asked on question number 18 and 19, respectively. Rather than the actual uncertainty or the actual competitive intensity in the present business environment, the respondents were asked for the perceptions of uncertainty and competition that influence decisions making, regardless of the organisation's operating

environments and intensity of market competition in their business sector. A five-point scale was used in this section. The respondents were asked to indicate a change of their business environment using a scale of 1 (not change) to 5 (sudden change) on questions of perceived environmental uncertainty. The MCI questions were measured based on a scale of 1 (not competitive) to 5 (high competitive); if the respondents thought the question items were not applicable in their organisation, they were asked to answer as N/A.

The PEU questions in this section were developed from the instrument developed by Gordon and Narayanan (1984), Gul and Chia (1994) and Abdel-Kader and Luther (2008) whereas the MCI questions were adopted from Mia and Clarke (1999), Tuan Mat *et al.* (2010) and Hoque (2011).

- Section 6: Integrated Information Systems

A list of ERP software vendors were provided for the respondents to identify which software package is currently used in their organisations. The respondents could select more than one software package. The respondents were also asked to specify their currently-in-use software applications if they were not on the list,

The respondents were also asked to determine whether their organisation is using any spreadsheet in accounting processes and whether or not people from the accounting department are part of a software application implementation project.

The last question in this section asked the respondents to explain benefits from software applications which are used.

The lists of software were adapted from Kallunki *et al.* (2011)

- Section 7: Organisational Performance

This section was designed to collect information on financial and non-financial performance measurement of an organisation. Respondents were asked to indicate to what extent the degree of perceived benefits to organisational performance increased on a scale from 1 (not at all important) to 5 (very important) both before and after software applications were implemented in their organisations. The organisational performance was understood to be the measure of degree of respondent's perception of success. Although it is recognised that perception of performance is not a measure of actual performance, this subjective measure has been used in the same field by other studies (i.e. Lee and Yang (2011) and Hyvönen (2007)). Actual performance could not be used in the quantitative study because the questionnaire

were anonymous, in order to encourage and promote a willingness of a respondent to answer questions.

However, this study have used actual performance data such as return on assets and return on equity, and total assets sales and net profit in the case studies. There are consistent results between quantitative and qualitative findings.

The questions comprise five items of financial performance measurements and another 5 items of non-financial performance measurements. Those items were developed from Govindarajan and Gupta (1985), Hyvönen (2007), Kallunki *et al.* (2011).

The second phase, the organisational culture perspective questionnaire was used to collect the respondents' opinions in determining 1) the perceived functioning of formal structures, strategies, policies and management processes and the participants' work values and work beliefs reflect organisational' expressive and affective systems and 2) the pattern of values and ideas in their organisations that shape human behaviour and its invention. The respondents were asked to give an opinion on their organisational culture individually and comparatively using a five-point scale, ranking and quantity.

There are two types of instruments in these questionnaires. First, the conception of organisational culture matrix was developed by Reynolds (1986) and Hofstede (1980, pp. 419-422) and adopted by Pratt and Beaulieu (1992), Chow *et al.* (1996) and Liu (2002). Second, the competing values model of CUL which was developed by Quinn *et al.* (1991) and used by Zammuto and Krakower (1991), Bhimani (2003) and Henri (2006).

➢ *Survey Population, Response Rate and Sampling Frame*

This research is conducted using questionnaires as the first phase and interviews as the second phase. Starting with questionnaires, sample data has been drawn from 507 listed companies on the SET as of February 2012. Within 507 companies there were 22 companies undergoing restructuring which presents a risk of being delisted. The remaining 485 companies are categorised in eight main business types: agro and food industry (41), consumer products (39), financials (59), industrials (81), property and construction (117), resources (26), services (84), and technology (38). Each of the main business types comprises sub-business types as follows:

1. Agro and food industry (41): agribusiness (15), and food and beverage (26)
2. Consumer products (39): fashion (23), home and office products (10), and personal products and pharmaceuticals (6)
3. Financials (59): banking (11), finance and securities (31), and insurance (17)
4. Industrials (81): automotive (20), industrial materials and machinery (7), packaging (13), paper and printing materials (2), petrochemicals and chemicals (12) and steel (27)
5. Property and construction (117): construction materials (19), property development (63) and property fund (35)
6. Resources (26): energy and utilities (24), and mining (2)
7. Services (84): commerce (13), health care service (13), media and publishing (26), professional services (3), tourism and leisure (13), and transportation and logistics (16)
8. Technology (38): electronic components (11), and information and communication technology (27)

Financial organisations have special features and MA information is only slightly relevant in such organisations. Therefore the study excluded 59 financial organisations. Twenty-two companies under restructuring which were also excluded from this study resulting in an initial targeted survey size was therefore 426 companies.

Data collection was undertaken from March – June 2012. To get permission, to verify email addresses for correspondences and to get the most appropriate person to respond to the questionnaire, the Accounting Manager in each of 426 companies was called and consent for the study obtained from 350 companies. The questionnaire was then sent via email in May 2012, which included a web-link for the on-line version of the questionnaire. It should be noted there are some evidences of concern about collecting data in April. As the Thai New Year is in the middle of April and there are long public holidays in Thailand. In 2012, Thai government announced two extra holidays plus two days weekend. Listed companies on SET closed. Some employees took advantages to get nearly ten-day holidays. As a result, no phone calls were made to verify email addresses of the correspondents due to efforts to avoid any emotional disturbance, leading to no participation. Follow-up emails and phone calls were used to increase the return of questionnaire feedbacks after two weeks as stated on the cover letter. Additionally, the second email reminder and phone calls were undertaken after four weeks to increase the response rate. A total of 65 questionnaires were not returned. Therefore, the final sample size was 285 companies.

A total of 111 questionnaires were returned. When reviewing the feedback, thirteen of the questionnaires were incomplete and, therefore, excluded from this study (Phadoongsitthi, 2003; Wijewardena and De Zoysa, 1999). The final valid sample size is 98, resulting in a 23% response rate. The response rate of this study was higher than for randomly targeted samples using internet-based questionnaires which was suggested by Saunders *et al.* (2012, p. 421) at 11%.

➢ *Translation and Pre-testing*

Respondents who are not native English speakers may not answer specific response categories provided or may answer in terms implied by the questions (Forsyth *et al.*, 2007; Willis *et al.*, 2008). Translations from English into local languages may enhance national survey results, thus making them more representative (Ibid.).

Translating source questionnaires[26] into target questionnaires is extremely important for international research in order to have the same meaning of questions to all respondents (Saunders *et al.*, 2012). This study employed "mixed techniques" translation or back-translation approach suggested by Saunders *et al.* (2012, p. 442)[27], used by (Taylor *et al.*, 2008) and Spencer-Oatey (2008, p. 306) to ensure a best match between source and target questionnaires.

> "…to establish linguistic equivalence is back-translation. This procedure generally involves one bilingual translating the instrument from the first language into the second and another bilingual back-translating the instrument into the first language. Variations in original wording and the back-translation must then be reconciled." (Spencer-Oatey, 2008, p. 306).

However, these techniques are costly, requiring two or more independent translators, and some possibility of the source questionnaire being changed exists.

Therefore, the questionnaire in this study was initially designed in English, and then translated to Thai to meet the language requirements of Thai participants. Pilot tests were conducted in both languages at two stages. The first stage involved three Thai accounting managers, who are fluent in English. This was to ensure the relevance of meanings and instructions in a work context. The second stage involved two academic staff members, one

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[26] Source questionnaire is the questionnaire that is to be translated whereas target questionnaire is composed of the translated questions.
[27] There are four different translation techniques for questionnaires called direct translation, back-translation, parallel translation and mixed techniques. The back-translation approach (mixed techniques) undertaken by two or more independent translators; comparison of two new source questionnaires; creation of final version.

British and one Thai. This was to help further refine the questionnaire. The Thai version of the completed questionnaires was translated back to English by an independent Thai academic member, who has English teaching experience. This helped to ensure a consistency in translation. No significant difference of meaning between the English and Thai versions was observed.

3.6.2 Qualitative Design

Semi-structure interviews with a list for open-end interview questions were conducted to supplement the questionnaires' findings. The objectives of the interviews are to identify reasons why do organisations adopt/reject advanced MAPs. Regarding quantitative analysis on chapter four (Table 4.15), advanced MAP namely ABC and BSC were highly adopted; therefore, the interviews focus more on those advanced MAPs than others. In addition, conducting the interviews aim to explore interviewees' point of views related to the synergy between MAP adoption and IISs implementations.

There are 17 interviewees; 16 interviewees were interviewed in Thai language being the native language of the researcher and the interviewees; only one was interviewed in English language using semi-structure interviews. The choice of interviewees was based on twofold factors: a business sector and the questionnaire respondents' willingness to be interviewees. The judgement was used to choose a variety of respondents in terms of business sectors to ensure that case companies cover all industrial types and interviewee positions to guarantee that a variety of position of interviewees represent organisational culture of case companies. Therefore four companies with three different business sectors were contacted to get permission for interviews. The different sectors were consumer product, technology and resource. Expected interviewees occupy at least three different positions: Chief Financial Officers (CFO), management accounting manager, Information Technology (IT) manager in each case company due to the purpose of this study. The interviewing details are provided in table 3.1.

Table 3.1: Interviewing Details

Companies/ Business types	Positions	Durations (Hrs.)
A/ Consumer product-home and office products	Chief financial officer (CFO)	1.30
	Accounting Manager	1.00
	Direct Sales Director	1.00
	Senior Factory Director	0.35
B/Technology	Head of Information Technology Division	0.55
	Head of Corporate Communications Division	0.50
	Head of Accounting Division	1.00
C/Resources	Assistant Vice President in Accounting	1.15
	Head of Information Technology Division	0.40
	Head of Division A	0.45
	Head of Division B	0.55
	Head of Division C	0.30
D/Consumer product-fashion	Vice President Accounting and Finance	1.00
	Accounting Manager	1.00
	Sale Administration	0.40
	Vice President Information Technology Division	1.20
	Head of Division	0.45
Total interview hours conducted		15.40

➢ *Interview Administration*

The interviews were conducted during May - September 2013. After obtaining permission to interview from the CEO of each case company, expected interviewees were contacted and asked for interview appointments. The process of conducting an interview was as follows:

- An interview cover letter and questions of interviewing guidelines which is comprised of two sections: the first section contains interview questions and the second section is about organisational culture questionnaires were sent to interviewees before an interview. For a set of interview questions see appendix F-G

- The interviewees were asked reasons for adopting/not adopting MAPs in their organisations, any contingent factors which were based on questionnaire findings that influenced the MAP adoption, and whether they believe there are any links between MAP adoption and IIS implementation on organisational performance.

- Each interview started with an expression of appreciation for the interviewee giving time for an interview then a brief objective of the interview was explained to guide the interviewee for which the interview was intended.

- Interviewees were asked for a permission to using an audio recording device during an interview. Only one interviewee was uncomfortable being recorded so notes were taken and reconfirmed for an accuracy with the interviewee at the end of the interview.

- Interviewees were thanked for their cooperation at the end of the interview and assured of confidential proceedings.

- Notes were taken during the interview. The interviewees' voices which were recorded were transcribed. The 16 transcriptions which were in the Thai language were then translated into English by the researcher; two Thai individuals with advanced degrees from universities in the USA performed verification of the translations.

3.7 Reliability and Validity of Data

Reliability is a significant measurement providing stable and consistent results to a study when combined with validity (Wilson, 2014, p. 116). Bryman (1988) indicated that reliability and validity are significant parameters in order to identify the consistency of measure and indicate the extent to which a measure is non-biased. To reduce errors and improve validity and reliability of data based on questionnaires, design of questions, structure of questionnaires and pilot testing procedures should be carefully conducted in order to assure the data collection accuracy and consistency (Saunders et al., 2012). The reliability and validity measurements which were employed in this study are explained below.

3.7.1 Reliability and Validity of Quantitative Data

➢ **Reliability of Quantitative Data**

Reliability is concerned with data collection techniques and analytic procedures to produce consistency of an instrument measures (Collis and Hussey, 2009; Sekaran, 2013). Cronbach's coefficient alpha is commonly used as a statistical technique to assess the level of internal reliability of an instrument (Easterby-Smith et al., 2012; Saunders et al., 2012). The Cronbach's alpha coefficient (α) is a value between 0 and 1; the accepted criterion should be greater than 0.5 according to Nunnally (1994). Hair et al. (2010) and Bryman and Bell (2011) recommended, however, a minimum accepted alpha should be a threshold of 0.6 in the social science studies.

In this study, the reliability of the questionnaires was assessed by the Cronbanch's alpha coefficient using SPSS statistical software analysis version 22. Table 3.2 presents the Cronbach alpha value for each questionnaire's construct that is higher than 0.6 except a construct of organisational strategy. Results from the SPSS analysis using the option "scale if item deleted" show that if three out of four items[28] from Miles and Snow's framework were deleted, the coefficient alpha will be 0.641 which is acceptable but only one item (reactor) from the Miles and Snow's framework was included in this construct. Therefore, only Porter's framework which included 2 items (product differentiation and low costs) was used in an analysis.

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[28] Regarding the question number 17 on the questionnaire, respondents were asked to scale from 1 (strongly disagree) to 5 (strongly agree) on each SG description provided. There are 6 items of description of SG which were adopted from two framework. First, Miles and Snow's framework included 4 items to describe strategy of defender, prospector, analyser and reactor. Second, Porter's framework included 2 items to describe strategy of product differentiation and low costs.

Table 3.2: Reliability of Questionnaires Results

Constructs/Variables	Question	No. of items	Cronbach's alpha
The degree of perceived benefits from MAPs	Q15	57	0.993
Organisational structure and organisational culture	Q16	16	0.768
Organisational strategy	Q17	2	N/A
Perceived Environmental Uncertainty	Q18	5	0.708
Intensity of Market Competition	Q19	20	0.983
Organisational performance BEFORE integrated information system implementation	Q24	10	0.854
Organisational performance AFTER integrated information system implementation	Q25	10	0.930

As mentioned earlier, the Cronbach alphas from data which was collected using questionnaires in this study indicates a high reliability and internal integrity of questionnaires. Next, validity of data from the questionnaires was tested.

➢ *Validity of Quantitative Data*

Validity is the extent to which constructs or measures and research findings provide accurate representation of supposed evidences of the phenomenon under study (Easterby-Smith *et al.*, 2012; Wilson, 2014). Forms of validity which indicate the quality of research are external validity and internal validity. Saunders *et al.* (2012, p. 194) stated that "external validity is concerned with the question: can a study's research findings be generalised to other relevant settings or groups…a researcher should take great care when selecting a sample from within a population to make sure that it represent that population…". Internal validity is comprised of two common forms: content and construct validity. Content validity refers to an adequate measure to reflect the content of the concept in research questions (Bryman and Bell, 2011). A number of scale items which represent field of concept being measured are positively associated with the content validity (Sekaran, 2013). Another internal validity is construct validity which seeks to ensure correct operational measures for concepts or theoretical assumptions being studies (Yin, 2014). Pre-testing questionnaires using a pilot study is one method of aiming for construct validity (Wilson, 2014). Therefore, the validity can be improved by ensuring accurate measures used by data collection methods, valid sampling and using proper statistical data analysis (Cohen, 2011).

In this study, some of these procedures were used in order to achieve the validity of the questionnaire as follows;

- External validity; non-response bias was tested to ensure that data from the respondents was representative of the target sample population. If non-response bias exists or there is a significant difference between respondents and non-respondents, it implies that companies with certain characteristics are more likely to be non-respondents. Additional data regarding business sectors from non-response companies which were followed up using telephone calls were collected to carry out non-response bias test. The results showing in table 3.3 indicate that there were no statistically significant differences between respondent and non-respondent companies based on business sector, indicating there is at least one common characteristic of respondents similar to the non-respondents. Hence, the survey findings in this study can reasonably be generalised to the whole of the companies listed on the Stock Exchange of Thailand.

Table 3.3: Chi-square Test between Respondents and Non-respondents based on Business Sectors

Business sector types and respondents

| | | no. of respondents | | |
		yes	no	Total
Business types	Agro and Food Industry	18	7	25
	Consumer Products	9	9	18
	Technology	11	3	14
	Industrials	25	21	46
	Property and Construction	15	16	31
	Resources	5	1	6
	Services	15	8	23
Total		98	65	163

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.246[a]	6	.221
Likelihood Ratio	8.598	6	.197
Linear-by-Linear Association	.195	1	.659
N of Valid Cases	163		

a. 2 cells (14.3%) have expected count less than 5. The minimum expected count is 2.39.

- Content validity, scale items and measures in this study were developed from relevant existing literature (section 3.6.1).
- Construct validity, pre-testing the questionnaires was conducted by a number of people who have knowledge and skill in MA fields and pilot questionnaires were also conducted (section 3.6.1).

3.7.2 Reliability and Validity of Qualitative Data

Reliability of interviews reflects reality at the time of data collection which may change; the validity of interviews is slightly higher when researchers have gained access to a participant's knowledge and experience and inferred meanings from the language used by the participants (Saunders *et al.*, 2012). However, there are no perfect measurements or concepts to ensure reliability and validity of qualitative data (Kirk, 1986). Gibbs (2007) and Creswell (2014) state that "qualitative validity means that the researcher checks for the accuracy of the findings by employing certain procedures, while qualitative reliability indicates that the researcher's approach is consistent across different researchers and different projects.".

In this study, semi-structured interviews were conducted as part of the case studies to supplement quantitative findings based on research questions. Interview questions were done using a pilot test to achieve validity of qualitative data. In interview processes, interview questions and a cover letter including interview objectives and assuring confidentiality of interview data were sent to the participants before an interview. The participants were asked for permission to record sessions during interviews. The researcher was aware of using tone or non-verbal behaviour which may create interviewees' answer bias and influence the performance of interviewees and their answer. However, reliability of interview data was based on interviewees whether they expressed their real opinions or truthly answered the interview questions.

3.8 Statistic Used in Data Analysis

At the first phase of data collection, online questionnaires were employed using SurveyMonkey which is an online survey development company. The license was provided by Newcastle University Business School in 2012. The data was downloaded directly from SurveyMonkey into SPSS statistic 21 software. Analytical tests were used to achieve research objectives and answer the research questions including descriptive analysis (frequency and crosstab) and statistical analysis (correlation, regression and factor analysis).

At the second phase, methods of data collection included semi-structured interviews at four case companies and self-administered questionnaires. The interview data was analysed using NVivo10 software to supplement quantitative findings. Data from the self-administered questionnaires was coded into number form and entered into the SPSS statistic 21. Kruskal-Wallis and Mann-Whitney tests were employed to analyse the questionnaire responses.

The following subsections present analytical techniques which were adopted in this study.

3.8.1 Descriptive Analysis

To achieve the first objective, descriptive analysis such as frequency, crosstab, graph and means was mainly employed. Frequency distributions and percentages were applied to identify general information, for example, characteristics of respondents and responding companies and IIS software application implemented in their companies. The relationship between adoption of MAPs and contingent factors (organisational size and business types) as well as the association between IIS implementation and the factors was determined using crosstab and graphs. In addition, the means were used to rank MAP adoption and accountant's perceptions of benefits from MAPs compared with two previous studies Phadoongsitthi (2003) and Nimtrakoon (2009). The findings related to descriptive analysis are provided in chapter four.

3.8.2 Correlation and Regression

Regression analysis generally starts with correlation analysis which aims to explore the association between pairs of variables as well as predicts scores on one variable from scores on another variable (Pallant, 2010). The sign of the correlation coefficient determines whether the association is positive or negative. The highest correlation coefficient score is +1 indicating a perfect positive relationship between two variables whereas the minimum score of -1 represents a perfect negative relationship between the two variables. A Correlation coefficient score of 0 means the two variables are independent of each other (Hair *et al.*, 2009). Dancey and Reidy (2007) indicate a correlation coefficient value of above 0.7 as a

strong correlation, between 0.3-0.7 as moderate correlation, and below 0.3 as weak correlation. It reveals that the higher the correlation coefficient, the stronger the relationship between the two variables. Thus, correlation is used to test the association among variables which will be used with regression models to gain some insight into relationships as well as assess the absence of multicollinearity[29].

In this study, Spearman correlation analysis is used to test the relationship amongst contingent factors namely PEU, MCI, SG, ST, CUL, IISs, business size and business sector or type of business as well as between groups of MAP adoption (B, DSS, LTP, PC, conventional and advanced performance evaluations (CPE and APE), and OP. Binary logistic regression is used to test the impacts of contingent factors on MAP adoption (hypotheses 1-6). Multiple regression is used to investigate the variance in the dependent variable (OP: financial and non-financial) caused by independent variables (groups of MAP adoption and IIS implementations) (hypotheses 7-14). The findings regarding these analyses are presented in chapter five.

3.8.3 Factor Analysis

Factor analysis[30] was used to summarise and reduce questionnaire items into a small group of variables or factors. The factorability of the items for each variable were measured and the adequacy of variables underlying factors by using Kaiser-Meyer-Olkin (KMO) (Acton et al., 2009; p.246-247). The KMO measure should equal 0.5 when the correlation matrix equals the partial correlation matrix. A KMO value greater than 0.7 is considered as middling or as good when the KMO value is greater than 0.8 i.e. all items are included in component or construct of factor analysis will be useful for these variables (Kaiser, 1974). The Bartlett test of sphericity which indicates an adequacy of correlations exist among the variables to proceed with the analysis (Hair et al., 2009). Cronbach's alpha was taken to test the reliability of each construct of organisational performance. All Cronbach's alpha values met acceptable reliability levels at 0.7 (Ibid.).

The principal component analysis[31] is used in this study to combine variables (PEU, MCI, ST, CUL and OP) into a set of dimensions based on a common relationship. The groups of

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[29] Multicollinearity is the extent to which a variable can be explained by the other variables in the analysis (Hair *et al.,* 2010).

[30] Each questionnaire's items were grouped by factor analysis based on a high correlation. Results which were calculated from factor analysis were assumed to represent the original data and can be used for further statistical analysis such as regression (Hair *et al.,* 2006).

[31] The principle component analysis seems to be more stable than common factor analysis and is the most commonly used model in business research (Hair *et al.,* 2003).

variables from factor analysis were used for further hypotheses testing in binary logistic regression and multiple regression. The results from factor analysis are provided in chapter five.

3.8.4 Kruskal-Wallis and Mann-Whitney Tests

This study investigates which factors influence or impede adoption of MAPs. One of the significant factors affecting adoption is organisational culture. Two non-parametric tests namely Kruskal-Wallis and Mann-Whitney, were applied to test for this effect. The Kuskal-Wallis one way ANOVA[32] was used to discover differences amongst the four case studies in relation to a perception of success of management accounting systems. The Mann-Whitney test[33] was applied to test the difference between two groups (accountants and non-accountants) and organisational culture elements (group-, developmental-, hierarchical- and rational culture). The results are presented in chapter six.

3.9 Ethics and Confidentiality

Ethical issues have been a growing consideration from academic disciplines including social sciences (Easterby-Smith *et al.*, 2012). The ethics were defined as a moral responsibility to conduct a study in an accurate and honest way (Wilson, 2014, p. 79). Bryman and Bell (2011) and Easterby-Smith *et al.* (2012) identified seven principles of ethical practices in social science research as follows;

1. Ensuring that no harm comes to participants
2. Respecting the dignity of research participants
3. Ensuring a fully informed consent of research participants
4. Protecting the privacy of research subjects
5. Ensuring the confidentiality of research data
6. Protecting the anonymity of individuals or organisations
7. Avoiding deception about the nature or aims of the research

Those are key principles in research ethics which are concerned with protecting the interests of research subjects. In this study, a main concern is consent. A cover letter on the first page of questionnaires and interview questions (Appendix C and F) guaranteed confidentiality and anonymity to the participants. The cover letter also included a brief statement of objectives of

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[32]The Kruskal-Wallis test is used to compare scores in more than two groups within different samples. Scores are ranked together in one series (Bryman and Cramer, 2011, p.169).

[33] The Mann-Whitney test is used to test the difference between two groups; assumptions are dependent variable was ordinal or continuous level whereas an independent variable should consist of two categorical, independent groups.

this study. Respondents who are unwilling to participate have a right to withdraw from this study without giving reasons. The participants' name and case companies' name were kept anonymous in this study. Although most of the interview dialogue was recorded using audio recorders with permission of the interviewees before the interview commenced, one interviewee, however, refused to be recorded during the interview process. In this instance notes were taken to replace recording.

3.10 Conclusions

This chapter discusses research philosophy and methods adopted in this study. The justification of choosing a pragmatic paradigm and a mixed methods approach including data collection were explained. Quantitative data from companies listed on the SET were collected using an online questionnaire survey; a response rate of 23% was realised. Seventeen executive managers from four case companies were interviewed to extract new ideas which might supplement the quantitative data. SPSS statistic software version 21 and NVivo 10 software were used to analyse quantitative and qualitative data respectively. An evaluation to ensure the validity and reliability of data and statistical tests applied in this study was explained. Lastly, concerns of ethics and confidentiality were presented.

The following chapters, four and five, present findings from online questionnaire surveys. Chapter six provides results from semi-structured interviews and self-administered questionnaires used in four case companies.

Chapter 4. Descriptive Analysis

4.1 Introduction

This chapter provides a descriptive analysis of quantitative data on the first objective: to explore the current state of adoption of and perceived benefits from MAPs by companies in Thailand. The following section begins with a description of background information related to the respondents and their companies. Then, preliminary descriptive associations between individual MAP adoption, industrial type and organisational size will follow. The section ends with an establishment of the basis for the retrospective empirical evidence of adoption rates and perceived benefits of MAP in Thailand by comparing data with two previous studies (Phadoongsitthi, 2003; Nimtrakoon, 2009).

4.2 Descriptive Analysis

The descriptive analysis will describe respondent demographics, MAP adoption and IIS implementations.

4.2.1 Respondent Demographics

Demographic data is shown in table 4.1 for the 98 useable responses in total, resulting in 23% response rates. All questionnaire responses are from companies listed on the SET. Organisational backgrounds including industry types, organisational size measured by either number of employees, total assets or net sales, and respondent's position is also stated.

Table 4.1: Demographics of Respondents

	No.	%
Industry types:		
Agro and Food Industry	18	18.4
Consumer Products	9	9.2
Industrials	25	25.5
Property and Construction	15	15.3
Resources	5	5.1
Services	15	15.3
Technology	<u>11</u>	<u>11.2</u>
Totals	<u>98</u>	<u>100.0</u>
Organisational size: (number of employees in 2011)		
Under 250	22	22.4
251 – 750	25	25.5
751 – 1,250	14	14.3
1,251 – 2,500	13	13.3
Over 2,500	<u>24</u>	<u>24.5</u>
Totals	<u>98</u>	<u>100.0</u>
Organisational size: (total assets in 2011 (million pounds))*		
Less than 20	18	18.4
20 – 100	38	38.8
101 – 300	22	22.4
301 – 500	5	5.1
Over 500	<u>15</u>	<u>15.3</u>
Totals	<u>98</u>	<u>100.0</u>
Organisational size: (net sales in 2011 (million pounds))*		
Less than 20	21	21.4
20 – 100	32	32.7
101 – 200	18	18.4
201 – 1,000	17	17.3
Over 1,000	<u>10</u>	<u>10.2</u>
Totals	<u>98</u>	<u>100.0</u>
Nationality of organisation		
Thai state-owned	91	92.9

	No.	%
Japanese-owned	2	2.0
European-owned	1	1.0
American-owned	1	1.0
Others	<u>3</u>	<u>3.1</u>
Totals	<u>98</u>	<u>100.0</u>
Nationality of Chief Executive Officer (CEO)		
Thai	86	87.8
Japanese	3	3.1
European	2	2.0
American	1	1.0
Others	<u>6</u>	<u>6.1</u>
Totals	<u>98</u>	<u>100.0</u>

*1 GBP = 50 THB

There are seven types of businesses represented. The majority of returned questionnaires are from industrial or manufacturing companies at 25.5% of the respondents. The remaining companies are 18.4% in the agriculture and food industry. While, 15.3% of the respondents came from property and construction as well as services; other business types are technology, consumer products, and natural resources which consist of 11.2%, 9.2% and 5.1% of the respondents respectively.

Organisational size has been measured by three measurements: number of employees, total assets, and net sales. 47.9% of the respondent companies employ between 250 and 750 people. The number of employees varies from 751 to 2,500 at 27.6% and over 2,500 employees at 24.5%. When the size of the organizations is measured by total assets, 57.2% of respondents have less than 100 million pounds, 27.5% ranging from 101-500 million pounds, and 15.3% with over 500 million pounds. In term of net sales, over 30% of the respondents have 20 – 100 million pounds, 35.7% have 101-1,000 million pounds, and 10.2% have over 1,000 million pounds.

Thais are majority of respondents in terms of nationality of organisation and nationality of CEO. Table 4.2 shows 91 of 98 individual respondents, 92.9%, are Thai-state owned organisations. The rest are 2% Japanese-owned, European-owned and American-owned equivalent at 1%, and 3% of others including 1% of Hong Kong and 2% of Taiwan. Nevertheless, the overwhelming majority of CEO nationality is Thais at 87.8%. Japanese,

European and American are other nationality of CEO of the individual respondents at 3%, 2% and 1%, respectively. Other nationality of CEOs are, 6.1%, Hong Kong, Malaysian, Philippines, Taiwanese and Thai-Chinese.

Table 4.2: Nationality of CEO and Nationality of Organisation

		Nationality of CEO					Total
		Thai	Japanese	European	American	Other Asian	
Nationality of Organisation	Thai state-owned	85	1	1	0	4	91
	Japanese-owned	0	2	0	0	0	2
	European-owned	1	0	0	0	0	1
	American-owned	0	0	0	1	0	1
	Other Asian-owned	0	0	0	0	3	3
	Total	86	3	1	1	7	98

As shown in table 4.2, it seems that nationality of organisation is almost consistent with the nationality of CEO. 91 of 98 individual respondent organisations are Thai state-owned organisations. Most Thai state-owned organisations employ a Thai CEO at 85 of 91 respondent organisations. 6 of 91 Thai state-owned organisations employ Japanese, European, Malaysian, Philippines, Taiwanese and Thai-Chinese. Only one European-owned, respondent organisation employs a Thai CEO. In contrast, 6 of 98 respondent organisations employ CEOs which have the same nationality as the organisations; two of Japan-owned organisations, an American-owned organisation, a Hong Kong-owned organisation and two Taiwan-owned organisations.

Table 4.3: Characteristics of Respondents

	No.	%
Gender:		
Male	38	38.8
Female	60	61.2
Total	98	100.0
Age:		
Less than 25 years	2	2.0
25 – 35 years	30	30.6
36 – 45 years	34	34.7
46 – 55 years	25	25.5
More than 55 years	7	7.1
Total	98	100.0
Education:		
PhD or equivalent	2	2.0
Master Degree	49	50.0
Bachelor Degree	47	48.0
Total	98	100.0
Position:		
Chief Financial Officer (CFO)	16	16.3
Accounting Manager	41	41.8
Assistant Accounting Manager	15	15.3
Accounting Supervisor	9	9.2
Assistant Accounting Supervisor	8	8.2
Accountant	6	6.1
Other	3	3.1
Total	98	100.0
Certification:		
A certified public accountant (CPA)	25	25.5
Continuing Professional Development (CPD)	10	10.2
A certified internal auditor (CIA)	3	3.1
Chartered Financial Analyst (CFA)	1	1.0
Tax Auditor (TA)	2	2.0
None	57	58.2

	No.	%
Total	<u>98</u>	<u>100.0</u>
Education or Training/Work Experience abroad:		
A Western country	10	10.2
A Non-Western country	15	15.3
None	73	<u>74.5</u>
Total	98	<u>100.0</u>

Characteristics of individual respondents are as shown in table 4.3 illustrate gender, age, education, position, qualification and education/work/training experience abroad. 60 of 98 or 61.2% are female whereas 38.8% are male. 90.8% of respondents age between 25 -55-year-olds. 2% of the respondents are less than 25 year-olds and the respondents' age more than 55 year-olds at 7.1%. Half of individual respondents, 50%, graduated with at least a master degree and 48% of individual respondents graduated with at least a bachelor degree. Only 2% of the respondents graduated with a PhD or equivalent degree. In term of respondents' position, most responding personnel hold positions as accounting mangers at 41.8%, CFO at 16.3% and assistant accounting managers at 15.3%. Accounting supervisor, assistant accounting supervisor and accountant are 9.2%, 8.2% and 6.1%, respectively. Other respondents comprising 3.1% are senior costing, internal auditing manager and assistant director. Less than 50% of the respondents are holding a special certification. A CPA is amongst the respondents at 25.5%. The other certifications such as CPD, a CIA, a CFA and TA are also represented by the respondents at 10.2%, 3.1%, 1% and 2%, respectively. Most of the respondents at 74.5% have never had foreign experience either education, training or work experience. The number of respondents who have had either an education or an experience at a western country is almost equivalent to the number of respondents who have had either an education or an experience at a non-western country at 10.2% and 15.3%.

Table 4.4: Integrated Information System Implementations

Software vendors	No.	%		Software vendors	No.	%
ACCPAC	2	1.74		Hyperion	4	3.48
AutoFlight	2	1.74		IBM-Cognos	5	4.35
BAAN/JD Edwards	2	1.74		In-house	24	20.87
EasyAcc	1	0.87		MAC 6	1	0.87
Oracle Application	15	13.04		Navigator	1	0.87
Express	6	5.22		SAP R/3	33	28.70
Formula or Forma	15	13.04		WinSpeed	4	3.48
				Total	115	100.00

Note: some organisations have implemented IIS more than once

Several software packages have been implemented in the sample organisations, as shown in table 4.4. Some organisations have implemented more than one package. The most IIS implementation presented in the survey are SAP R/3 at 28.7%, in-house software at 20.87%, Oracle and Hyperion application at 16.52%, and Formula or Forma at 13.04%. Other packages are less than 2% in each package: Express, IBM-Cognos, WinSpeed, ACCPAC, AutoFight, BAAN/JD Edwards, EasyAcc, MAC6 and Navigator. One possible explanation for these findings is a SAP organisation has a market share more than an Oracle organisation amongst listed organisations in Thailand

➢ *Summary*

The descriptive information shows a majority of respondents from industrials sector; a number of firms have employees of less than 750; total assets and net sales less than 100 million pounds. Most Thai state-owned organisations were directed by Thai CEOs. In addition, an IIS namely SAP is the most commonly implemented amongst organisational respondents. The majority of questionnaires were completed by female accounting managers. Half of the respondents hold a master degree. A few respondents hold a CPA and had training/work experience abroad.

4.2.2 Management Accounting Practice Adoption

MAPs are classified into five groups: B, DSS, LTP, PC, and PE. These classifications were generated from previous lists developed by researchers (Chenhall and Langfield-Smith, 1998a; Luther and Longden, 2001; Phadoongsitthi, 2003; Angelakis *et al.*, 2010; Nimtrakoon and Tayles, 2010; Abdel Al and McLellan, 2011; Yalcin, 2012; Abdel Al and McLellan, 2013) (Appendix A). A number of MAPs which was used and have been used by accountants in Thai context was included. This resulted a total of fifty-seven MAPs for the purpose of this study.

The questionnaires were collected from listed companies on the SET. There are seven types of industries represented; agro and food industry, consumer products, industrials, property and construction, resources and technology. To facilitate discussion, the following section will illustrate preliminary findings based on five groups of individual MAPs and types of industry (Appendix I-M) and five groups of individual MAPs and size of organisation measured by number of employee (Appendix N-R).

➢ *Management Accounting Practice Adoption and Types of Industry*

Organisations in Thailand might not emphasise MA information. The different types of organisations that have adopted a different number of MAPs present in appendix I-M. The following sections present MAP adoption in five areas (B, DSS, LTP, PC and PE across seven sectors (agro and food industry, consumer products, industrials, property and construction, resources, services and technology).

First, a group of budgeting system adoption and types of industry illustrates in appendix I. Within industrial types, there are four types of organisations: customer product, property and construction, resources and technology which adopt MAPs in the budgeting systems group more than 50%. It seems that two conventional MAPs; budgeting systems – controlling costs and –planning cash flows are popular amongst the seven industry types, with each type of industry adopting more than 40%. Excluding those two conventional MAPs, agro and food industry, consumer products and industrial may not be motivated to adopt more MAPs in the budgeting system group, more than 50% adopting. Moreover, technology organisations have adopted budgeting systems –compensating manager, -evaluating managers' performance, and ABB which is an advanced MAP, at more than 50%. Only budgeting systems – coordinating activities across the business unit has been adopted more than 40% within property and construction and resource organisations. Budgeting systems – compensating manager, -

planning day-to-day operation have been adopted more than 40% within property and construction organisations whereas –planning financial position have been adopted in resources organisations, and zero-based budgeting has been adopted in services organisations at 40%. It can be seen that technology organisations have highly adopted, more than 50%, budgeting systems compared with other types of industry.

Second, appendix J presents group of decision support systems adoption and types of industry. As indicated, more than 40% of organisations which operate in resources, property and construction, technology and services seem to adopt a variety of MAPs. Several MAPs; product profitability analysis, TQM, benchmarking-product/service characteristics, CVP, and EVA have been adopted within resources organisations at more than 60%. Within property and construction organisations, only CVP have been adopted more than 50% whereas more than 50% of technology organisations have adopted benchmarking –operational process and ABM. However, amongst four type of industry trend to adopt more MAPs; TQM, CPA, BSC separately form performance evaluation, benchmarking – strategic priorities, -management process, -operational process, EVA, value chain analysis and JIT at least 40% of respondents organisations within their industrial types. It can be seen that advanced MAPs are popular within specific industrial types, for example, product profitability analysis, TQM, benchmarking-product/service characteristics and EVA within resources, benchmarking-operational process and ABM within technology.

Third, according to appendix K it seems that adoption of MAPs in LTP group are important for resources organisations with adoption rates more than 40% in every MAPs category. Similarly, more than 35% of technology organisations have adopted all MAPs in the group. Capital budgeting techniques – IRR has been adopted more than 40% within consumer product, property and construction and services organisations at the same adoption rates as within property and construction organisations adopting capital budgeting techniques – NPV and payback period. Capital budgeting techniques –payback period has been adopted more than 40% within consumer product and technology organisations. The technology organisations also adopted formal strategic planning and strategic plans developed with budgeting more than 45%. However, agro and food industry and industrial organisations may use less MAPs information in the LTP group than other types.

Fourth, appendix L presents individual MAPs in the PC group and different types of industry. It would claim that conventional MAPs including absorption costing and standard costing are widely adopted across seven types of industry more than 40% adopted. Regarding adopted

rates more than 50%, property and construction and services organisations have adopted cost modelling, whilst, more than 50% of those responding resources organisations have adopted Kaizen costing and ABC. Technology organisations also highly adopted ABC at 72.7%. It might be seen that resources organisations have placed more emphasis on advanced MAPs such as Kaizen costing and ABC than the other types of industry. Besides, agro and food industry, consumer products and industrial organisations relied on conventional MAPs namely absorption costing and standard costing.

Fifth, PE adoption and types of industry presents in appendix M, property and construction, resources and technology organisations have adopted performance evaluation – budget variance analysis and CFROI, more than 40% within their own organisational type. Property and construction and resources organisations which have adopted variety of MAP within their organisations seem to adopt performance evaluation –customer satisfaction, - divisional profit and BSC, at more than 40%. Only property and construction organisations have adopted performance evaluation - controllable profit, - team performance and return on investment more than 50%. Resources organisations tend to adopt more advanced MAPs such as – production processes, -qualitative measures, -employee attitudes, non-financial measures and one conventional MAP –residual income at 40% adoption rate, whereas MAPs that technology organisations have adopted at more than 40% adoption rate include one advanced MAP; -non-financial measures and two conventional MAPs; -ROI and –CFROI. Whilst, services organisations place an emphasis on –budget variance analysis at 40%, agro and food industry, consumer product and industrial organisations may not highly adopt MAPs in the PE group. However, agro and food industrial, consumer product and industrials organisations have adopted MAPs in the PE group less than 50%. It can be seen that not only have advanced MAPs namely -division profit and -customer satisfaction been highly adopted within property and construction and resources organisations, BSC is in particular being highly adopted within those two organisational types and technology organisations.

Overall, although the total percentage of MAP adoption is less than the total percentage of non-adoption, different types of organisation have different percentage of adoption rates. Industrial organisations seem to adopt more MAPs than other industries. However, conventional MAP in areas of budgeting systems and product costing were adopted by more than 50% of the respondents. Agro and food industry, consumer product and industrial organisations might employ less information from DSS, LTP and PE, with less than 45% adopted by these organisations. Within its sector, resources, technology, and property and construction organisations adopted more MAPs than other types of industry with more than

40% adopting within this industrial type. Organisations which operate within this class, technology industry, may adopt MAPs in groups of B, DSS and LTP. Resources industry may focus more on DSS, PC, and PE. However, the data show that agro and food industry and consumer product organisations may use less MAPs information than the other industry types.

As stated before, the descriptive analysis is inconsistent with (Al-Omiri and Drury, 2007). Industrial organisations require efficient usage of raw materials and labour resources and could gain profitability from implementing some of the MAPs so a number of MAP usage in industrial organisations was higher than for other industrial types. These are supported by (Innes *et al.*, 2000), (Paolo and Andrea, 2010) and (Nimtrakoon and Tayles, 2010).

> *Management Accounting Practice Adoption and Size of Organisations*

Organisational size influences the number of MAP adoption. For larger size of organisations MAP adoption rates might be higher than for small size ones. As previous studies have done, size of organisations can be measured by the number of employees which was applied in this study. Respondents were asked to estimate the number of employees in their organisations located in Thailand. There are five ranges on the questionnaires; under 250, 251-750, 751-1,250, 1,251- 2,500 and over 2,500. To facilitate discussion, the number of employees was used as a proxy for size are reported – large size of organisations might employ more employees than small organisations. Thus, average percentages of the respondents' organisations which employ less than 250 employees and 251-750 employees will be assigned to the small organisation category. The average percentages of the respondents' organisations which employ 751 – 1,250 employees and 1,251- 2,500 will be called a medium organisation. The respondents' organisations which employ more than 2,500 employees will be considered a large organisation (Kimberly, 1976; Merchant, 1981; Ezzamel, 1990; Nimtrakoon and Tayles, 2010; Kober *et al.*, 2012).

The following section will describe preliminary data of adoption of five categories of MAP; B, DSS, LTP, PC, and PE and organisational size.

First, different size of organisations and individual MAPs in the budgeting systems category presents in Appendix N. In general, budgeting systems-controlling costs and -planning cash flows adoption seem to play an important role amongst the respondents' organisations, at more than 40% in every organisational size. In total, less than half of the respondents' organisations adopted other budgeting practices: budgeting systems - compensating managers, - coordinating activities across the business unit, - planning day-to-day operations, ABB, - planning financial position, - evaluating managers' performance and zero-based budgeting.

Only one budgeting practice - coordinating activities across the business unit has been adopted at 53.8% within organisations that employ 1,251 - 2,500 employees.

Figure 4.1 shows individual MAP adoption rates in the budgeting system group for small-, medium-, and large organisations. Medium and large organisations have adopted conventional MAPs: -controlling cost, -planning cash flows, - coordinating activities across the business unit, -planning financial position more than small organisations. Larger organisations have adopted advanced MAPs namely ABB and zero-based budgeting more than smaller organisations. Nevertheless, budgeting systems -compensating managers, -planning day-to-day operations and -evaluating manager's performance have been highly adopted in small organisations.

Figure 4.1: Budgeting System Adoption within Different Organisational Sizes*
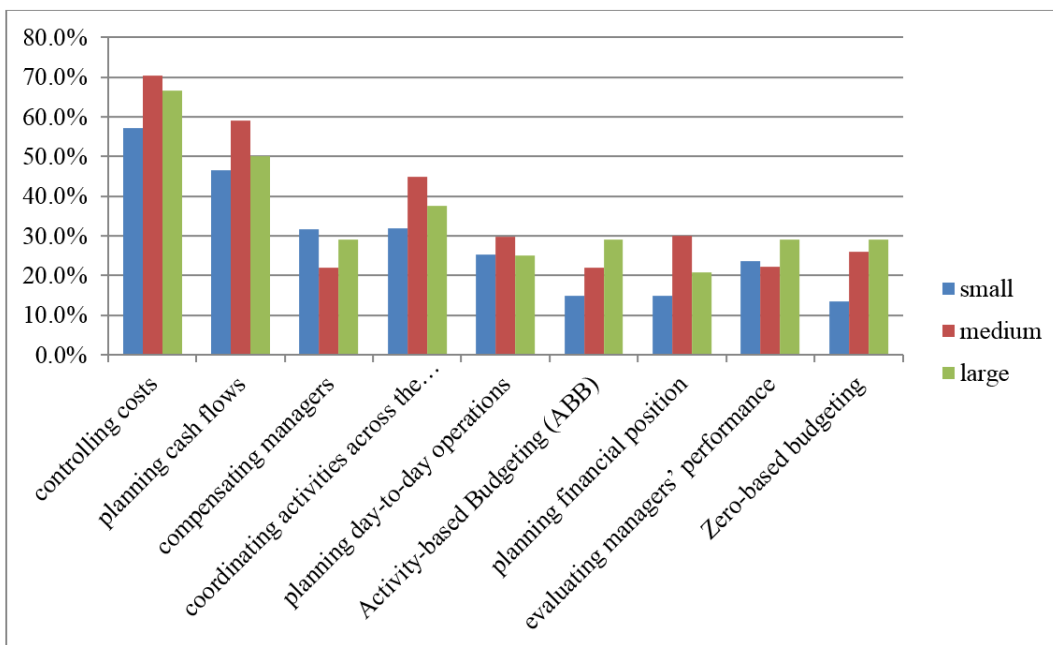
* small size: less than 750 employees, medium size: 751-2,500 employees, large size: more than 2,500 employees

Second, appendix O show adoption MAP adoption in area of DSS and size of organisations. As indicated, total adoption rates of TQM, product profitability analysis, CVP are highest rates amongst different size of organisations at 34.7%, 33.7% and 32.7%, respectively. All of MAPs in the DSS group have been adopted less than 35%. Half of the respondents' organisations which employ 751 − 1,250 and more than 2,500 employees have adopted CVP, TQM has been adopted within organisations employing more than 2,500 employees at 58.3%.

In contrast, product life cycle analysis and SVA have not been adopted within organisations employing 251 – 750 employees.

The adoption rates of DSS practices varies within different size of organisations (Figure 4.2). Most of the practices have been adopted within medium- and large organisations higher than small organisations except benchmarking – management process and –operational process. Advanced MAPs: product profitability analysis, TQM, benchmarking – carried out within the wider organisation, EVA, value chain analysis, product life cycle analysis, operations research techniques and CVP which is a conventional MAP have been increasingly adopted as the organisation size increased.

Figure 4.2: Decision Support System Adoption within Different Organisational Sizes*
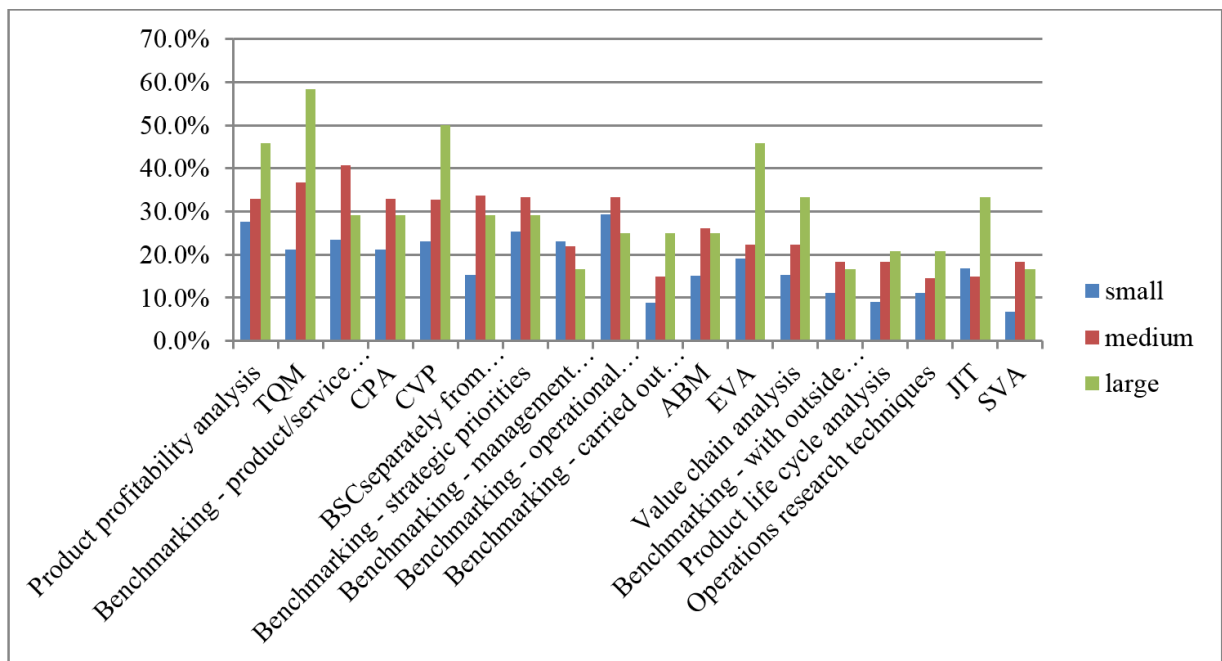
* small size: less than 750 employees, medium size: 751-2,500 employees, large size: more than 2,500 employees

Third, the adoption rate for individual MAPs in the long term planning group and by size of organisation are presented in appendix P. In total adoption rates, capital budgeting techniques – NPV, -IRR, and -payback period have been highly adopted and rank as the top three at 41.8%, 38.8% and 37.8% respectively. Most of the respondents' organisations that employ more than 2,500 employees have adopted capital budgeting techniques – IRR, formal strategic planning and long range forecasting more than other size of organisations at 50%, 58.3% and 50%. Capital budgeting techniques – NPV has been adopted at 53.8% within those

respondents' organisations employing 1,251 – 2,500 employees whereas more than 50% of the organisations employing 751 – 1,250 employees have adopted capital budgeting techniques – payback period and long range forecasting.

Figure 4.3 illustrates adoption rates of individual MAPs in the LTP group within different size of organisations. LTP practices seem to play important role in medium- and large size of organisations. Adoption rates of six out of seven LTP practices within large organisations have been found higher than the adoption rates within medium and small organisations. Besides, only capital budgeting technique – NPV has been adopted within medium organisations more than large- and small size of organisations.

Figure 4.3: Long-term Planning Adoption within Different Organisational Sizes*
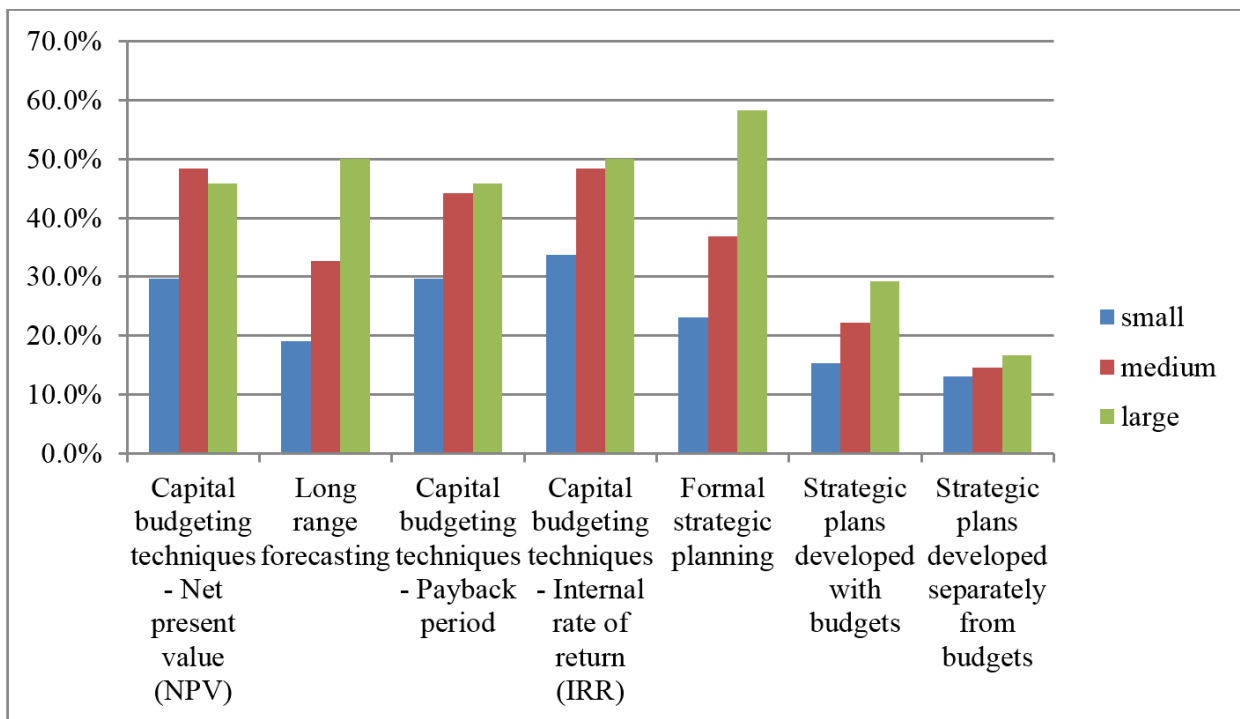
* small size: less than 750 employees, medium size: 751-2,500 employees, large size: more than 2,500 employees

Fourth, the adoption rates of PC and organisational size illustrate in appendix Q. It seems that no matter how large organisations are, absorption costing and standard costing remain dominant amongst different size of organisations, more than 40% adoption rates within each size of organisation. Organisations which employ 751-1,250 employees have highly adopted most of MAPs within the PC group; cost modeling, kaizen costing and cost of quality except throughput accounting which is more popular within organisations employing less than 250

employees. Moreover, within organisations employing 1,251-2,500 employees ABC and variable costing has been highly adopted. By contrast, organisations which employ over 2,500 employees adopted target costing at 25%.

Figure 4.4 illustrates different adoption rates for individual MAPs in PC group within small-, medium- and large size of organisations. Medium organisations seem to adopt absorption costing, cost modeling and ABC more than small- and large organisations whereas standard costing has a lower adopting rate than the other organisations. Nevertheless, the adoption rates of kaizen costing, variable costing, cost of quality, TC and throughput accounting have been found to increase based on the size of organisations.

Figure 4.4: Product Costing Adoption within Different Organisational Sizes*
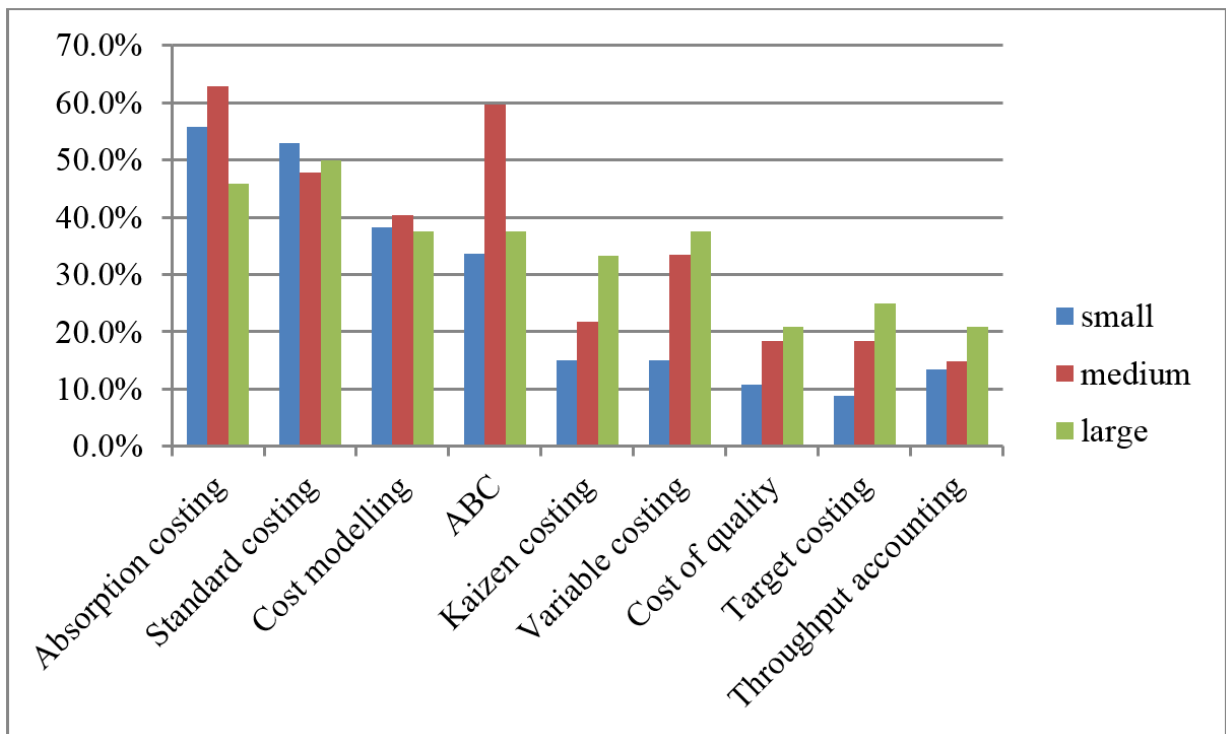
* small size: less than 750 employees, medium size: 751-2,500 employees, large size: more than 2,500 employees

Lastly, a group of PE which consist of fourteen MAPs and organisational size presents in appendix R. In total, adoption rates of PE – budget variance analysis and –BSC have highly ranked on the first two MAPs adoption rates at 44.9% and 37.8%. Regarding high adoption rates within different size of organisations, the smallest size of organisations employing less than 250 employees have adopted PE – ongoing supplier evaluations and –employee attitudes at 22.7% and 18.2%, those employing 751 – 1,250 employees have adopted PE – budget

variance analysis, -customer satisfaction, ROI, -controllable profit and –team performance at 57.1%, 42.9%, 50%, 35.7%, and 42.9%, respectively. Large organisations or organisations which employ more than 2,500 trend to emphasize advanced MAPs: BSC and non-financial measures and conventional MAPs: PE, - CFROI, - divisional profit, - qualitative measures, - production processes, and - residual income.

As indicated in figure 4.5, adoption rates of conventional MAPs: budget variance analysis, controllable profit, division profit, ROI, CFROI, production process, and residual income and advanced MAPs: customer satisfaction, BSC, qualitative measures, ongoing supplier evaluations, employee attitude, and non-financial measure have been higher in large organisations than smaller ones. Only PE –team performance have been adopted within medium organisations greater than for small- and large size of organisations.

Figure 4.5: Performance Evaluation Adoption within Different Organisational Sizes*
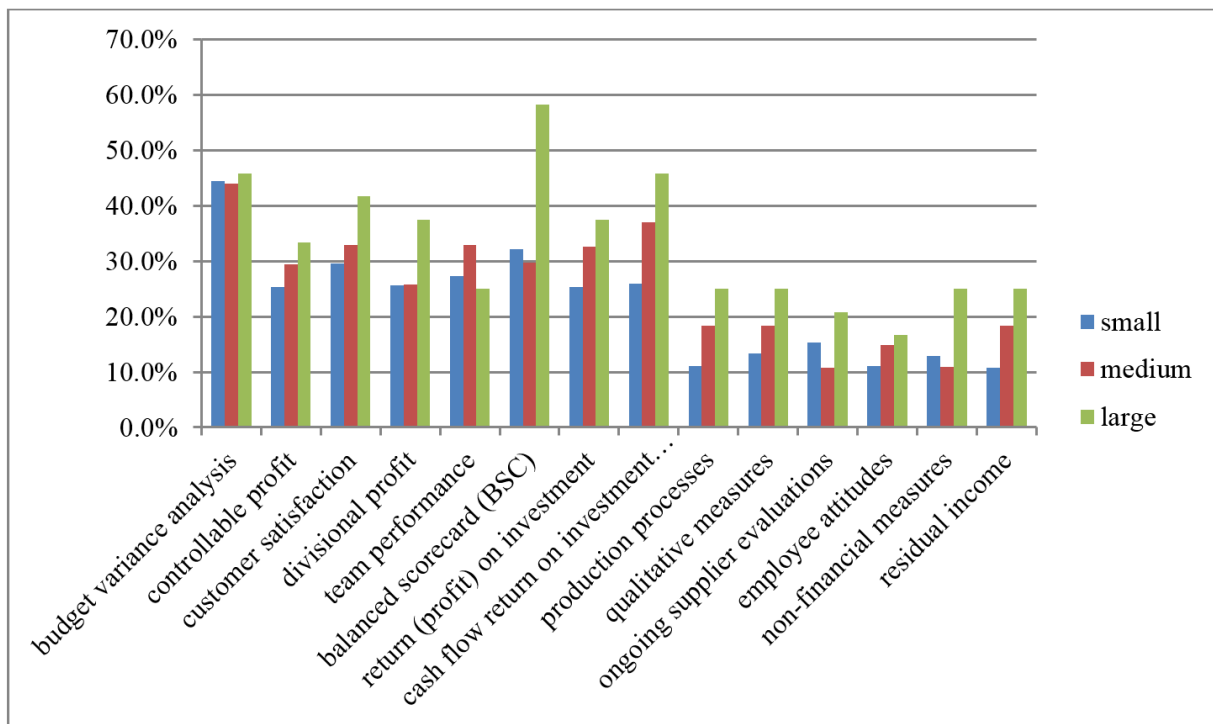
* small size: less than 750 employees, medium size: 751-2,500 employees, large size: more than 2,500 employees

To sum up, in terms of organisational size, most MAPs have been adopted within larger organisations rather than the smaller ones. For example, advanced MAPs in B group namely ABB, zero-based budgeting, budgeting systems – compensating manager, and - evaluating managers' performance have been adopted by large organisations more than by small- and

medium size organisations. Similarly, in the DSS group, product profitability analysis, TQM, benchmarking – carried out within the wider organisation, EVA, value chain analysis, product life cycle analysis, and operations research techniques have played a significant role within large organisations more than for small ones. Adoption rates of MAPs in the LTP group, in turn, are less than 45% in total. Conventional MAPs namely, capital budgeting techniques – IRR, NPV, and payback period, formal strategic planning and long-range forecasting have been adopted by more than 50% within the medium- and large organisations. In the PC group, medium size of organisation seems to adopt more advanced MAPs such as ABC and cost modelling whereas the larger size of organisations display a trend to adopt more advanced MAPs: kaizen costing, TC and cost of quality more than the smaller ones. Lastly, medium- and large size of organisations or organisation which employ over 751 have adopted PE practices more than organisations of smaller size. Most advanced MAPs in the PE group such as BSC and customer satisfaction have been adopted by large organisations. A conventional MAP: PE – budget variance analysis has an equivalent adoption rate amongst those three organisational sizes. Hence, it seems that as the size of an organisation increases, the greater the choice of MAPs for adoption.

The descriptive results of this study are consistent with (Hoque and James, 2000), (Abdel-Kader and Luther, 2008) and (Wu and Boateng, 2010) with larger organisation size being associated with advanced MAP usage. A larger organisation size may increase task complexity which requires the division of labour and greater access to resources to experiment with advanced MAPs such as ABC (Chenhall and Langfield-Smith, 1998a; Laitinen, 2001; Ahmad, 2014).

4.3 Adoption of and Perceived Benefits from MAPs in Thailand from 2001 - 2012

Although the MAP adoption rates were examined in previous studies, there are general comparisons amongst different countries (Wijewardena and De Zoysa, 1999; Joshi, 2001; Hyvönen, 2005; Joshi *et al.*, 2011; Yalcin, 2012). This study aims to determine how pervasive adoption of MAPs is in Thailand by conducting comparisons which are drawn from two prior studies in Thailand, i.e. Phadoongsitthi (2003) and Nimtrakoon (2009) which were conducted in the years 2001 and 2008 respectively. The perceived benefits from MAPs are determined by ranking on the basis of mean scores of individual MAPs, an approach used in previous studies (Chenhall and Langfield-Smith, 1998a; Joshi, 2001; Hyvönen, 2005; Angelakis *et al.*, 2010).

4.3.1 Management Accounting Practice Adoption

MAP adoption could be divided either by the proportion of organisations adopting MAPs: high, moderate and low, or by functions: B, DSS, LTP, PC, and PE (Chenhall and Langfield-Smith, 1998a; Hyvönen, 2005; Yalcin, 2012). This study adopts the former, a high proportion is classified by at least 35% of adoption rate of a MAP. The moderate are classified by at least 20%. Less than 20% are classified as low adoption. As detail shown in table 4.5, MAP comparative results are divided into three panels: 13 MAPs are classified as high adoption, the next 23 practices as moderate adoption, and the rest, 21 practices, as low adoption. The classification panel is not meant to imply that adoption are either high or low in any absolute sense. It can be seen that the level of MAP adoption varies across companies through time. The ranking of practices on adoption does not necessarily correlate with ranking of perceived benefits in table 4.6.

Table 4.5: Management Accounting Practices Adoption

	Ca*	This study			Nimtrakoon (2008)			Phadoongsitthi (2003)		
		Rank	% adoption	N[a]	Rank	% adoption	N[b]	Rank	% adoption	N[c]
High Adoption										
Budgeting systems - controlling costs	B	1	63.27	62	1	95.6	129	1	93	65
Absorption costing	PC	2	55.1	54	9	84.4	114	10	73	51
Budgeting systems - planning cash flows	B	3=	51.02	50	5	89.6	121	2	89	62
Standard costing	PC	3=	51.02	50	8	85.2	115	14=	64	45
Performance evaluation - budget variance analysis	PE	4	44.9	44	2=	92.6	125	5	84	59
Activity-based costing (ABC)	PC	5=	41.84	41	26	71.1	96	26	39	27
Capital budgeting techniques - Internal rate of return (IRR)	LTP	5=	41.84	41	2=	92.6	125	4=	86	60
Capital budgeting techniques - Net present value (NPV)	LTP	6=	38.78	38	2=	92.6	125	4=	86	60
Cost modelling	PC	6=	38.78	38	18	77	104	-	-	-
Capital budgeting techniques - Payback period	LTP	7=	37.76	37	2=	92.6	125	4=	86	60
Performance evaluation - balanced scorecard (BSC)	PE	7=	37.76	37	21	74.8	101	23	47	33
Budgeting systems - coordinating activities across the business unit	B	8	36.73	36	9	84.4	114	9	74	52
Formal strategic planning	LTP	9	35.71	35	12	82.2	111	6	83	58
Moderate Adoption										
Total Quality Management (TQM)	DSS	10	34.69	34	-	-	-	15	63	44
Product profitability analysis	DSS	11	33.67	33	4	91.1	123	3	87	61

	Ca*	This study			Nimtrakoon (2008)			Phadoongsitthi (2003)		
		Rank	% adoption	N^a	Rank	% adoption	N^b	Rank	% adoption	N^c
Performance evaluation - cash flow return on investment (CFROI)	PE	11=	33.67	33	16=	79.3	107	16	61	43
Performance evaluation - customer satisfaction surveys	PE	11=	33.67	33	7	86.7	117	7	81	57
Cost-volume-profit analysis (CVP)	DSS	12	32.65	32	6	88.1	119	8	80	56
Long range forecasting	LTP	13=	30.61	30	14=	80.7	109	6	83	58
Performance evaluation - return (profit) on investment	PE	13=	30.61	30	3	91.9	124	10	73	51
Benchmarking - operational process	DSS	14=	29.59	29	14=	80.7	109	13	66	46
Benchmarking - product/service characteristics	DSS	14=	29.59	29	11	83	112	11=	70	49
Budgeting systems - compensating managers	B	15	28.57	28	16=	79.3	107	23	47	33
Benchmarking - strategic priorities	DSS	15=	28.57	28	19	76.3	103	12	67	47
Performance evaluation - controllable profit	PE	15=	28.57	28	17	77.8	105	22	49	34
Performance evaluation - divisional profit	PE	15=	28.57	28	10	83.7	113	13	66	46
Performance evaluation - team performance	PE	15=	28.57	28	11	83	112	18	59	41
Customer profitability analysis (CPA)	DSS	16	26.53	26	12	82.2	111	-	-	-
Budgeting systems - planning day-to-day operations	B	16	26.53	26	15	80	108	-	-	-
Economic value added (EVA)	DSS	16	26.53	26	22=	74.1	100	17	60	42
Variable costing	PC	17	25.51	25	20	75.6	102	20	53	37
Budgeting systems - evaluating managers' performance	B	18	24.49	24	-	-	-	-	-	-

	Ca*	This study			Nimtrakoon (2008)			Phadoongsitthi (2003)		
		Rank	% adoption	N[a]	Rank	% adoption	N[b]	Rank	% adoption	N[c]
Balance Scorecard (BSC) separately from performance evaluation	PE	19	23.47	23	-	-	-	-	-	-
Benchmarking - management process	DSS	20=	21.43	21	13	81.5	110	18	59	41
Kaizen costing	PC	20=	21.43	21	31	65.2	88	19	54	38
Value chain analysis	DSS	20=	21.43	21	32	64.4	87	25	43	30
Low Adoption										
Activity-based budgeting (ABB)	B	21=	20.41	20	28	68.9	93	-	-	-
Budgeting systems - planning financial position	B	21=	20.41	20	-	-	-	-	-	-
Zero-based budgeting	B	21=	20.41	20	29=	68.1	92	29	27	19
Activity-based management (ABM)	DSS	21=	20.41	20	29=	68.1	92	-	-	-
Just-in-Time Costing (JIT)	DSS	21=	20.41	20	23	73.3	99	27	34	24
Strategic plans developed with budgets	LTP	21=	20.41	20	-	-	-	-	-	-
Performance evaluation - qualitative measures	PE	22	17.35	17	-	-	-	-	-	-
Performance evaluation - production processes	PE	23=	16.33	16	-	-	-	-	-	-
Performance evaluation - residual income (e.g. interest adjusted profit)	PE	23=	16.33	16	22=	74.1	100	21	51	36
Cost of quality	PC	24=	15.31	15	25	71.9	97	-	-	-
Performance evaluation - non-financial measures	PE	24=	15.31	15	-	-	-	-	-	-
Performance evaluation - ongoing supplier evaluations	PE	24=	15.31	15	20	75.6	102	13	66	46

	Ca*	This study			Nimtrakoon (2008)			Phadoongsitthi (2003)		
		Rank	% adoption	N[a]	Rank	% adoption	N[b]	Rank	% adoption	N[c]
Target costing	PC	24=	15.31	15	24=	72.6	98	24	44	31
Throughput accounting	PC	24=	15.31	15	24=	72.6	98	-	-	-
Operations research techniques	DSS	25=	14.29	14	27	69.6	94	28	31	22
Product life cycle analysis	DSS	25=	14.29	14	24=	72.6	98	23	47	33
Benchmarking - carried out within the wider organisation	DSS	25=	14.29	14	-	-	-	11=	70	49
Benchmarking - with outside organisations	DSS	25=	14.29	14	-	-	-	-	-	-
Strategic plans developed separately from budgets	LTP	25=	14.29	14	-	-	-	-	-	-
Performance evaluation - employee attitudes	PE	26	13.27	13	30	67.4	91	14=	64	45
Shareholder value added (SVA)	DSS	27	12.24	12	22	74.1	100	17	60	42

[a] A number of all responses are 98, [b] A number of all responses are 135, [c] A number of all responses are 70, Ca*= Categories consists of PC = Product costing, DSS = Decision support system, B = Budgeting systems, PE = Performance evaluation, LTP = Long term planning

To facilitate the discussion, MAP items with relatively high, moderate, or low rates of adoption are considered and presented in respective MAP classification as budgeting system (B), decision support systems (DSS), long term planning (LTP), product costing (PC) and performance evaluation (PE).

➢ **Budgeting System Adoption**

Budgeting systems remain dominant in Thailand over the entire period. Budgeting for controlling cost, - planning cash flow, - coordinating activities across the business unit has a relative high adoption rate. ABB, zero-based budgeting and B- planning financial position are in the low adoption panel. The proportion of B used for compensating managers and zero-based budgeting has risen from rank 23th and 29th to rank 15th and 21th in 2001 and 2012 respectively. ABB, which was not tested in 2001, has gradually been adopted moving from rank 28th in 2008 to rank 21st in 2012. This phenomenon is consistent with Hyvönen (2005) who studied MAP adoption in Finland and indicates that budgeting for controlling costs is highly adopted whereas B – planning financial position is ranked lowest. Thus, B might be worth including in this study (Ibid.). Yalcin (2012) also suggests that annual budgeting for planning seem to be highly adopted across countries; Turkey, Greece, Finland, India, Australia and Japan.

➢ **Decision Support Systems Adoption**

The most adopted DSS is ranked in moderate and low adoption panel and the major adoption of DSS have somewhat decreased CVP falls twice from 6th rank to 12th rank as well as product profitability analysis reduces from 4th rank into 11th rank. Moreover, product/service characteristics, management process or CPA have decreased significantly throughout the period. Van Raaij et al. (2003) indicated that CPA which is based on ABC principles reinforce firms' efforts to determine the profit contribution of customer segments and/or individual customer. Conversely, ABM, strategic priorities, JIT adoption has increased significantly.

➢ **Long-term Planning Adoption**

Capital budgeting techniques – IRR (ranked 5th), - NPV (ranked 6th), and – payback period (ranked 7th) and formal strategic planning (ranked 9th) are ranked in the high adoption panel on LTP. Formal strategic planning which improves performance is also highly implemented in Greece in Angelakis et al. (2010) study.

➢ *Production Costing Adoption*

A group of PC which include absorption costing, standard costing, ABC, and cost modelling has a high adoption rate. The proportion of ABC has risen from rank 26th to rank 5th in 2001 and 2012 respectively. Chongruksut (2002) attributes the possible causes of the increased use of ABC in Thailand to the Asian financial crisis and increased competition. Joshi et al. (2011) found that ABC and TQM are adopted moderately across Gulf Cooperation Council Countries (GCC). Companies in the GCC region are placing considerable emphasis on performance measurement techniques to monitor and enhance organisational performance (Ibid). However, over the period of 2001-2012, adoption of variable costing, kaizen costing and TC remains constant and are not in the high adoption panel. The use of the variable costing method increases slightly, from 20th to 17th. The adoption rate of TC in Thailand is relatively low as is also the case in the United Kingdom, Australia and New Zealand (Yazdifar and Askarany, 2012).

➢ *Performance Evaluation Adoption*

PE practices have been identified as a symbolic function which might fulfil organisational strategic focus and influence decision-making (Li and Tang, 2009). Over the past decade, the applications of PE have changed differently showing both decreasing and increasing trends. Budget variance analysis remains among the top-five ranking in 2001, 2008 and 2012 whereas BSC has been increasingly adopted moving from a rank of 23rd, 21st and 7th. In the Chenhall and Langfield-Smith (1998a) study in Australia financial performance measures like budget variance analysis have also shown a relatively high adoption rate.

In the moderate- and low adoption panel, the CFROI, controllable profit and team performance also gradually climbs up but customer satisfaction surveys and divisional profit decline. The ROI has exhibited fluctuating trends ranked at 10th, 3rd and 13th in 2001, 2008 and 2012. Residual income and ongoing supplier evaluations are ranked at lowest adoption rate.

In addition this study demonstrates some evidence of diffusion of some advanced MAPs, which were not previously adopted in either 2001 or 2008 studies, are in use in Thailand now. These MAPs are PE – qualitative measures, - production processes, - non-financial measures, and benchmarking – with outside organisations.

➤ *Summary and Discussion*

Traditional- or conventional practices have remained dominant in Thailand. Regardless, the results on MAP adoption (Table 4.5, high adoption panel), show 11 out of 13 practices are conventional practices; budgeting systems for controlling costs, -planning cash flows, -coordinating activities across the business unit, formal strategic planning, PE for budgeting variance analysis, absorption costing, standard cost, cost modelling, and capital budgeting techniques – IRR, NPV and payback period. Only two advanced practices; ABC and BSC are ranked on the high proportion of adoption and those two practices have been increasingly adopted since 2001. Focusing on the top five ranking, budgeting systems for controlling costs, -planning cash flows, PE for budgeting variance analysis, and capital budgeting techniques – IRR and NPV remain highly adopted in 2001, 2008 and 2012. Similarly, prior studies which had been conducted over two decades since 1990s, found that budgeting for controlling costs and –planning cash flows are the most beneficial significant practices in the firms participating, highly adopted at the top five ranking, in Australia, Japan, India, Finland, Greece, Egypt and Turkey (Chenhall and Langfield-Smith, 1998a; Wijewardena and De Zoysa, 1999; Joshi, 2001; Hyvönen, 2005; Angelakis et al., 2010; Abdel Al and McLellan, 2011; Yalcin, 2012). These findings also support prior studies on the increasing of ABC and BSC adoption in Thailand. Chongruksut (2006) who conducted a mail survey to examine ABC adoption and implementation in Thailand in 2001 found that ABC adoption rates were relatively high amongst respondent firms having ABC knowledge and having an idea of adopting ABC. Table 4.5, moderate adoption panel, the adoption rates for MAPs in the area of DSS; TQM, product profitability analysis, CVP, benchmarking, CPA, EVA, and value chain analysis are higher in proportion to other groups whereas non-financial performance measurement show a low proportion of adoption. Joshi et al. (2011) who conducted a study in the Gulf Cooperation Council countries to examine diffusion of MAPs. They find that MAPs in the area of cost management and strategy such as TQM, Kaizen costing, ABM and TC are have adoption rates, while, the adoption rates of performance measurement practices are moderate. Although, some differences appear between MAPs in moderate- and low adoption panel across countries, the high proportion of adoption remain conventional practices.

In aspect of five areas of MAPs, this study reveals that a budgeting system is commonly used, except for zero-based budgeting. The findings are consistent with previous empirical studies across countries. Joshi (2001) and Chenhall and Langfield-Smith (1998a) indicated that budgeting systems: plan day-to-day operations, return on investment, budget variance analysis, divisional profit, planning cash flows, coordinating activities across business units,

controlling costs and planning financial position were highly adopted in Indian and Australian manufacturing companies. Angelakis et al. (2010) and Hyvönen (2005) studies in Greece and Finland also similarly pointed out a high use of controlling cost, planning financial position, coordinating activities across the business units, and planning cash flows. From the findings of this study one might infer that Thai companies consider conventional budgeting systems as an important management accounting tool.

Next, the rates of DSS adoption in Thailand are moderate and low adoption occurred during 2001-2012. These results are similar to Abdel Al and McLellan (2011)'s study conducted in Egypt regarding product profitability analysis which is widely adopted at a relatively moderate adoption rate. In this context, product profitability analysis however, is highly adopted in Australia, Greece and Finland (Chenhall and Langfield-Smith, 1998a; Angelakis et al., 2010). Tuan Mat et al. (2010) support a high findings for the use of product profit analysis in Malaysian manufacturing firms.

The findings reveal a high use of LTP namely capital budgeting techniques including IRR, NPV, and payback period over the study period. Similarly, previous studies conducted in Turkey, Greece, Finland, India, Australia, Japan and Egypt (Yalcin, 2012) also found a high adoption rate. Although over a decade the rate of formal strategic planning adoption is relatively high in Thai companies, the adoption rates are low in Egypt (Abdel Al and McLellan, 2011).

However, the findings reveal that the trend of PC adoption namely absorption costing (or full costing), standard costing, and ABC has shown a slight increase over the years. The results are partially consistent with previous studies, the use of absorption costing and standard costing which show a relatively high adoption rate (Chenhall and Langfield-Smith, 1998a; Wijewardena and De Zoysa, 1999; Joshi, 2001). On the opposite side, ABC which is one of the resource allocation tools most companies' use has a relatively low adoption rate in Greece and Turkey (Angelakis et al., 2010; Yalcin, 2012). Askarany and Yazdifar (2012) report that although ABC can enhance OP, companies in three western countries: UK, Australia and New Zealand are considered non-adopters of ABC. Joshi et al. (2011) argue that ABC has currently been adopted and the trend is for more future adoption in GCC countries[34.]

Lastly, the findings of this study indicate that PE namely budget variance analysis and BSC are relatively popular amongst Thai companies. The budget variance analysis which is a

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[34] The GCC comprises six Persian Gulf Arab states: Bahrain, Kuwait, Saudi Arabia, Oman, Qatar and the United Arab Emirates.

financial performance measurement seems to help ensure success in all organisations; the rates of adoption are also relatively high in many countries (Chenhall and Langfield-Smith, 1998a; Hyvönen, 2005; Angelakis et al., 2010). For BSC, the findings are consistent with Joshi et al. (2011)'s study; the majority of companies in GCC countries have adopted BSC and the trend indicates a very high rate of adoption. However, the adoption rates of BSC in Finland, Greece and Egypt are relatively low (Angelakis et al., 2010; Abdel Al and McLellan, 2011). Tariq (2007) argue that BSC has been widely adopted in the Egyptian companies but multi-dimensional indicator usages are relatively low.

In summary, the findings of this study are consistent with evidence in the existing literature, in that the adoption rates of conventional MAPs were higher than advanced MAPs during economic uncertainties and crises (McLaren, 2013; Farouk Abdel Al, 2011; Angelakis et al., 2010; Hyvönen, 2005). In addition, although Thai organisations place a greater focus on financial-based and conventional MAPs, there is some evidence of diffusion of advance MAPs (including ABC and BSC), albeit in a gradual manner.

4.3.2 The Perceived Benefits from MAPs

Table 4.6 shows the pattern of perceived benefits from individual MAPs in five categories. The general trend is in line with that of MAP adoption. Firstly, in the category of product costing, there are increased perceived benefits of the following MAPs: absorption costing and standard costing whereas the benefits from variable costing and target costing are less well perceived. It is also evident that there are some fluctuations in rankings. For example, the ranking of ABC was slightly higher in 2008 (10th) than that in 2001 (27th), but dropped to 16th in 2012 and the kaizen costing rank was higher in 2001 (1st) than in 2008 (33rd) then increased to 24th in 2012.

Secondly, in the DSS category, the benefits from product profitability analysis and CVP are perceived as increasing and then decreasing, respectively. Another MAPs in the decision support system category obtains fluctuating benefits: benchmarking – product/service characteristics, - management process, - operational process, EVA, value chain analysis, product life cycle analysis, operations research techniques, JIT, and SVA. However, the evidence of this study suggests that the benefits of CVP and TQM are certainly not apparent in Thai companies, in spite of their acclaimed popularity in some MA textbooks (e.g. Drury, 2009).

Thirdly, the category of budgeting systems also shows a mixed picture, the perceived benefits of budgeting systems - planning cash flows remains constant, while there are some significant

increases in appreciation of budgeting systems-compensating managers, but less for zero-based budgeting. The ranking of the perceived benefits of budgeting systems – coordinating activities across the business unit has some fluctuation (ranked 17th, 30th and 12th in the year of 2001, 2008 and 2012) and – controlling costs (ranked 6th, 1st and 4th in the year of 2001, 2008 and 2012).

Fourthly, in the PE category, - budget variance analysis, controllable profit, - divisional profit, - team performance, - ROI, and - CFROI are found to provide relatively increased benefits. While performance evaluation – ongoing supplier evaluations, - employee attitudes, and – residual income are found to have relatively low benefits. On the other hand, the rankings of perceived benefits of customer satisfaction surveys have shown some fluctuating trends but remain among the top ten ranking. These findings echo Phadoongsitthi (2003)'s suggestion of companies' growing emphasis on customer satisfaction.

Lastly, the findings suggest that LTP provides high benefits in particular long range forecasting, capital budgeting – IRR, - NPV, and payback period. Interestingly, only formal strategic planning has highly perceived benefits in 2008 (rank 9th) but not in 2001 and 2012 (rank 15th and 14th respectively). The financial crisis during 1997 and the 2010 period might have caused organisations to apply formal strategic planning to business goal setting, environmental scanning, employee participation, and plan implementation tactics.

Table 4.6: The Perceived Benefits from MAPs

	Ca*	2012[a]				2008[b]	2001[c]
		N	Mean[d]	SD	Rank	Rank	Rank
Absorption costing	PC	54	3.83	0.77	1	15	11
Standard costing	PC	50	3.8	0.81	2	6	7=
Cost modelling	PC	38	3.68	0.9	7=	16	-
Activity-based costing (ABC)	PC	41	3.51	0.87	16	10	27
Kaizen costing	PC	21	3.38	1.02	24	33	2
Variable costing	PC	25	3.36	0.7	25	8	8
Cost of quality	PC	15	3.27	0.8	30	27	-
Target costing	PC	15	3.2	0.86	33=	21	9
Throughput accounting	PC	15	3.13	0.83	37=	23	-
Product profitability analysis	DSS	33	3.79	0.74	3	2	7=
Total Quality Management (TQM)	DSS	34	3.71	0.72	6	-	3
Benchmarking - product/service characteristics	DSS	29	3.55	0.69	13	14	17=
Customer profitability analysis (CPA)	DSS	26	3.54	0.95	14=	11	-
Cost-volume-profit analysis (CVP)	DSS	32	3.53	0.88	15	3	1
Balance Scorecard (BSC) separately from performance evaluation	DSS	23	3.48	0.73	18	-	-
Benchmarking - strategic priorities	DSS	28	3.46	0.74	19	22	22
Benchmarking - management process	DSS	21	3.43	0.87	21	19	28
Benchmarking - operational process	DSS	29	3.41	0.73	22	15	27
Benchmarking - carried out within the wider organisation	DSS	14	3.36	0.84	25	-	19
Activity-based management (ABM)	DSS	20	3.35	0.88	26=	20	-
Economic value added (EVA)	DSS	26	3.31	0.79	27	31	14
Value chain analysis	DSS	21	3.24	0.89	31	35	18=
Benchmarking - with outside organisations	DSS	14	3.21	0.89	32=	-	-
Product life cycle analysis	DSS	14	3.21	0.8	32=	33	26
Operations research techniques	DSS	14	3.14	1.03	36=	37	27
Just-in-Time Costing (JIT)	DSS	20	2.95	0.89	41	29	13
Shareholder value added (SVA)	DSS	12	2.92	1	42	31	14
Budgeting systems - controlling costs	B	62	3.76	0.78	4=	1	6

	Ca*	2012[a]				2008[b]	2001[c]
		N	Mean[d]	SD	Rank	Rank	Rank
Budgeting systems - planning cash flows	B	50	3.76	0.77	4=	4	5
Budgeting systems - compensating managers	B	28	3.61	0.88	9=	24	30
Budgeting systems - coordinating activities across the business unit	B	36	3.56	0.91	12=	30	17=
Budgeting systems - planning day-to-day operations	B	26	3.54	1.03	14=	38	-
Activity-based budgeting (ABB)	B	20	3.5	0.95	17=	18	-
Budgeting systems - planning financial position	B	20	3.35	0.75	26=	-	-
Budgeting systems - evaluating managers' performance	B	24	3.29	0.86	28	-	-
Zero-based budgeting	B	20	3.2	0.7	33=	32	29
Performance evaluation - budget variance analysis	PE	44	3.73	0.82	5	5	10=
Performance evaluation - controllable profit	PE	28	3.68	0.72	7=	24	24=
Performance evaluation - customer satisfaction surveys	PE	33	3.61	0.7	9=	7	4
Performance evaluation - divisional profit	PE	28	3.61	0.88	9=	23	21
Performance evaluation - team performance	PE	28	3.57	0.92	11=	26	25
Performance evaluation - balanced scorecard (BSC)	PE	37	3.57	0.83	11=	28	23
Performance evaluation - return (profit) on investment	PE	30	3.5	0.78	17=	13	12
Performance evaluation - cash flow return on investment (CFROI)	PE	33	3.45	0.87	20	17	18=
Performance evaluation - production processes	PE	16	3.19	0.98	34	-	-
Performance evaluation - qualitative measures	PE	17	3.18	0.95	35	-	-

	Ca*	2012[a]				2008[b]	2001[c]
		N	Mean[d]	SD	Rank	Rank	Rank
Performance evaluation - ongoing supplier evaluations	PE	15	3.13	0.83	37=	34	16
Performance evaluation - employee attitudes	PE	13	3.08	1.04	38	39	24
Performance evaluation - non-financial measures	PE	15	3.07	0.96	39	-	-
Performance evaluation - residual income (e.g. interest adjusted profit)	PE	16	3	0.89	40	36	20
Capital budgeting techniques - Net present value (NPV)	LTP	38	3.68	0.84	7=	12	10=
Long range forecasting	LTP	30	3.63	0.72	8	25	24=
Capital budgeting techniques - Payback period	LTP	37	3.59	0.96	10	12	10
Capital budgeting techniques - Internal rate of return (IRR)	LTP	41	3.56	0.92	12=	12	10=
Formal strategic planning	LTP	35	3.54	0.89	14=	9	15
Strategic plans developed with budgets	LTP	20	3.4	0.75	23	-	-
Strategic plans developed separately from budgets	LTP	14	3.14	0.77	36=	-	-

[a] A number of all response are 98, [b] A number of all response are 135, [c] A number of all response are 70, [d] The mean is based on a scale of 1 – 5, Categories* PC = Product costing, DSS = Decision support system, B = Budgeting systems, PE = Performance evaluation, LTP = Long term planning

➢ *Summary and Discussion*

The relatively low benefits attributed to advanced MAPs would be found in different groups of MAPs: B, DSS, LTP, PC and PE.

In budgeting systems, the results are consistent with Joshi (2001); the perceived benefits from conventional budgeting systems namely controlling costs, planning cash flows, compensating managers and coordinating activities have risen slightly whereas advanced budgeting – zero-based budgeting remains low. Similarly, Hyvönen (2005) and Abdel Al and McLellan (2011) found that Finnish companies placed a greater emphasis on conventional budgeting systems. However, there is a mixed picture of using budgeting for compensation managers. Joshi (2001) indicated that managerial compensation is linked to performance factors in an Indian context. Thus, using budgets for compensating managers received a high emphasis for the future. Unlike some studies, using budgeting for compensating managers was found to be less important for the future (Kaplan, 1994; Chenhall and Langfield-Smith, 1998a; Angelakis *et al.*, 2010).

However, Thai companies put a greater emphasis on DSS namely product profitability analysis whereas decreased emphasis is given to decision support systems namely value chain analysis and EVA. The tendencies of the perceived benefits reported from those MAPs are consistent with previous studies (Joshi, 2001; Hyvönen, 2005; Abdel-Kader and Luther, 2006). Chang and Hwang (2002) found that a developed country such as the United States may invest more resources in upstream activities and place a greater emphasis on value chain analysis than a developing country, Honk Kong. Chiwamit *et al.* (2014) findings supported that EVA may receive less emphasis in the Thai companies because it was facilitated by a group of dominant political figures with strongly vested, economic interests in pursuing such a reform programme rather than favouring global, capital markets interests.

As LTP, in turn, the perceived benefits from NPV, payback period and long-range forecasting has increased. This might imply that financial measures are important to Thai managers in order to do LTP. These findings are similar with the results of studies in Turkey, Finland, India, Australia and Japan (Yalcin, 2012). Angelakis *et al.* (2010) argue that a decreased emphasis is placed on long-range forecasting which a financial measure is.

In PC, this study reports that the perceived benefits from absorption costing and standard costing increase whereas ABC has slightly declined. The results are consistent with Innes *et al.* (2000), some UK's largest companies used ABC in parallel with their original costing

systems because of a somewhat tentative ABC implementation and no guarantee the results favour implementation (Innes and Mitchell, 1995). As a result, the proportions of ABC users and of those currently evaluating it have fallen, the UK's largest companies have increased consideration to reject ABC adoption (Ibid.).

Lastly, PE, tendencies to see perceived benefits from BSC are increasing whereas there is a slight decrease on an emphasis on customer satisfaction surveys. Yazdifar and Askarany (2012) reveal that BSC is important in the UK companies. Similarly, BSC and customer satisfaction surveys have a high significance for the firms in India, Greece and the Gulf Cooperation Council countries (Joshi, 2001; Angelakis *et al.*, 2010; Joshi *et al.*, 2011). Competitive business environment, organisations have increasingly focused on product quality, delivery, reliability, customer satisfaction and other non-financial measures (Drury, 2000).

In summary, the findings are consistent with previous studies which were conducted over two decades ago. Financial measures may dominate MAPs amongst Thai companies. A greater emphasis has been placed on conventional MAPs in two groups: B and LTP. However, to deal with high competition in the business environment, advanced MAPs in groups of DSS, PC and PE are important particularly product profitability analysis, ABC and BSC.

4.4 Conclusion

The findings relating to the first research objective which is to explore the current use of MAP and IIS in Thailand has been presented in this chapter. Descriptive findings have been presented including the respondent organisational backgrounds and the background of the respondents. Industrial companies are a majority of the responding organizations. Most questions were answered by an accounting manager. The main IIS implementation is SAP R/3. Moreover, the findings reveal some evidence of MAP changes in Thailand over the period 2001 – 2012 by comparing with previous studies, (Phadoongsitthi, 2003: Nimtrakoon, 2009).

Organisational size and types of industry may influence IIS implementation in Thailand. The findings of this study support Morton and Hu (2008)'s study, larger organisations have implemented IIS more than smaller ones. Amongst seven types of industry, technology and industrial are majority of respondent organisations which have implemented IIS. Hence, IIS seem to be implemented across business types in different size of organisations.

The trend of MAP adoption in Thailand reveals there have been only slight changes over the years, despite rapid changes in the economic, business environments, organisational size and business types. Larger size of organisation, MAP adoption rates seem to be higher than for small size ones. The rate of MAP adoption also varies within different types of industry. Resources, technology and property and construction organisations adopted more MAPs than the other types of industry whereas organisations which operate under agro and food industry, consumer product and industrial may focus less on MAPs information. Regarding MAP adoption rates, organisations also focus more on B – planning cash flows and PE – budget variance analysis. Some MAPs have shown both a high level of adoption and high perceived benefits. They are absorption costing, NPV, standard costing, B – planning cash flows; - compensating manager, PE – budget variance analysis; - controllable profit; - BSC; and CFROI. However, other MAPs present a mixed picture. For example, Thai organisations have increasingly adopted variable costing, operations research techniques, zero-based budgeting and JIT but do not recognise benefits from their use as yet. In addition, the popularity of product profitability analysis remains constant despite its usefulness being less well perceived by Thai companies.

The findings of this study is consistent with evidence found in the existing literature, in that the adoption rates of traditional MAPs were higher than advanced MAPs during economic uncertainties and crises (McLaren, 2013; Farouk Abdel Al, 2011; Angelakis *et al*., 2010; Hyvönen, 2005). In addition, although Thai organisations place more focus on financial-based and traditional MAPs, there is some evidence of diffusion of advanced MAPs (including ABC, BSC, benchmarking and JIT), albeit in a gradual manner.

In the next chapter the aim is to explain the factors influencing MAP adoption and IIS implementation. The findings of the intrinsic links between IIS implement and MAP adoption as well as the impacts of MAP adoption and IIS implementation on OP will be presented.

Chapter 5. Hypotheses Testing and Related Statistical Data Analysis

5.1 Introduction

The aims of this chapter are to investigate the developed hypotheses to explain contingent factors influencing the MAPs adoption; the direct impact of either MAP adoption or IIS implementations on OP; and the interaction effect of MAP adoption and IIS implementations on OP. Both financial and non-financial aspect of OP are investigated in this study.

5.2 Factor Analysis

Contingent factors, namely PEU; MCI; ST; CUL; IIS and OP both before and after IIS implementation were computed by applying the factor analysis[35]. The groups of variables from factor analysis were used for further hypotheses testing in binary logistic regression, multiple regression and moderated regression.

The results of the factor analysis for MCI (Panel A) and PEU (Panel B) are shown in table 5.1. The MCI construct comprise a measurement of the competitive environment of the business on five perspectives: customer requirements, price competition, distribution channels, products and/or services development and raw materials over half a decade. PEU, panel B, represents an uncertainty of market share, competitors' action and customer's requirement. Two items from the questionnaires which were "product and service development and innovation investment" and "political and economic influences surrounding your company" were eliminated to make the variable more efficient.

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[35] Each questionnaire's items were grouped by factor analysis based on high correlation. Results which were calculated from factor analysis were assumed to represent the original data and can be used for further statistical analysis such as regression (Hair et al., 2006)

Table 5.1: Factor Analysis and Reliability for Perceived Environmental Uncertainty and Intensity of Market Competition

	Component	
	1	2
Panel A: Intensity of Market Competition (MCI), Cronbach's alpha=0.983		
Competitive Environment: Customer requirements - 2012	**.907**	-.048
Competitive Environment: Customer requirements - 2010	**.904**	.001
Competitive Environment: Customer requirements - Next 3 years	**.902**	-.075
Competitive Environment: Distribution channels and market share - 2012	**.892**	.012
Competitive Environment: Price competition - Next 3 years	**.888**	.065
Competitive Environment: Products and/or Services development - 2010	**.879**	-.172
Competitive Environment: Price competition - 2010	**.877**	.171
Competitive Environment: Products and/or Services development - 2012	**.877**	-.220
Competitive Environment: Distribution channels and market share - Next 3 years	**.873**	-.037
Competitive Environment: Price competition - 2012	**.872**	.178
Competitive Environment: Price competition - 2008	**.869**	.312
Competitive Environment: Distribution channels and market share - 2008	**.867**	.139
Competitive Environment: Customer requirements - 2008	**.863**	.074
Competitive Environment: Distribution channels and market share - 2010	**.863**	.081
Competitive Environment: Products and/or Services development - Next 3 years	**.861**	-.207
Competitive Environment: Raw materials, parts and equipments - 2012	**.849**	-.157
Competitive Environment: Raw materials, parts and equipments - 2010	**.844**	-.128
Competitive Environment: Raw materials, parts and equipments - 2008	**.838**	-.037
Competitive Environment: Products and/or Services development - 2008	**.830**	-.123
Competitive Environment: Raw materials, parts and equipments - Next 3 years	**.827**	-.143
Panel B: Perceived Environmental Uncertainty (PEU)[a], Cronbach's alpha =0.785		
Market share	.030	**.837**
Competitors' action	.001	**.811**
Customer requirements	-.088	**.762**

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.901, Bartlett's Test of Sphericity at significant level p=0.000, Approx. Chi-Square=4192.102

ª the items of "product and service development and innovation investment" and "political and economic influences surrounding your company" with loading less than 0.55 were not eliminated adding little to the explanatory power of PEU dimension

ST and CUL are presented in table 5.2. Overall, the ST (panel A) was measured by communication capability within the organisation, decentralisation and formalisation. The CUL (panel B) was measured by power distance such as few authority levels and a hierarchical order and the need for every decision to be approved by the head of the organisation. An adequate KMO is 0.846. The Bartlett test of sphericity indicates an adequacy of correlations exist among the variables.

Table 5.2: Factor Analysis and Reliability for Organisational Structure and Organisational Culture

	Component	
	1	2
Panel A: Organisational structure, Cronbach's alpha =0.877		
Employees can make suggestions to their bosses or colleagues in order to improve work	**.786**	-.036
Your company shares or exchanges resources and information across departments	**.778**	.109
Every manager has authority to approve any issues affecting their business unit	**.777**	-.004
Employees can share opinions with their boss who involves them with decision making	**.776**	-.236
Every employee knows company rules in a formal way e.g. by letter or internal email	**.742**	.321
Staffs and managers in your company are be able to work on cross-function teams	**.718**	-.033
Middle managers or supervisors are usually supportive of their staff's work team	**.651**	.114
Seminars and sharing opinion meetings are set up often in order to share idea between operation employees and different management levels	**.577**	.217
Department goals are set by employees in and out of departments	**.575**	.091
Panel B: organisational culture, Cronbach's alpha =0.613		
Formal written communication is preferred more than face-to-face or telephone communication	.037	**.739**
There are many authority levels and a hierarchical	.256	**.735**
Every decision needs to be approved by the head of the organisation	-.193	**.611**
There are more than six organisational layers between operating staff and Chief Executive Officer (CEO)	.120	**.592**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.846, Bartlett's Test of Sphericity at significant level p=0.000, Approx. Chi-Square=455.257

Table 5.3 shows the results of the factor analysis for OP both before and after IIS implementation[36]. The Financial performance construct (Panel A1 and B1) consists of ROI, ROA, sales growth rate, cash flow from operations, and controlling cost. Panel A2 and B2 provide a measure for non-financial performance which is composed of customer satisfaction, market share, number of warranty claims or customer complaints, number of new product launches, and number of employees taking additional education or training. All results in the table supported factor analysis assumptions both KMO values and the Bartlett's test. Organisational performance before IIS implementation demonstrates the reliability with the Cronbach's alpha of 0.836 and 0.762 for financial and non-financial performance, respectively. While the values of OP after or post IIS implementation are 0.911 for financial performance and 0.884 for non-financial performance.

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[36] Sources of questionnaire items provide in chapter three, section 3.6.1

Table 5.3: Factor Analysis and Reliability for Organisational Performance before and after IIS Implementation

	Component	
	1	2
Panel A: Organisational Performance before IIS implementation (KMO=0.784, Bartlett's Test of Sphericity at significant level p=0.000, Approx. Chi-Square=366.291)		
Panel A1: Financial Performance (α=0.836, mean=4.104)		
Return on Assets (ROA)	**.824**	.179
Cash flow from operations	**.814**	.235
Return on Investment (ROI)	**.756**	.257
Sales growth rate	**.735**	.050
Controlling cost	**.603**	.302
Panel A2: Non-Financial Performance (α=0.762, mean=3.791)		
Number of new product launches	.150	**.823**
Number of employee taking additional education or training	.127	**.795**
Number of warranty claims or customer complaints	.224	**.774**
Market share	.230	**.542**
Panel B: Organisational Performance after IIS implementation (KMO=0.838, Bartlett's Test of Sphericity at significant level p=0.000, Approx. Chi-Square=647.974)		
Panel B1: Financial Performance (α=0.911, mean=3.622)		
Cash flow from operations	**.883**	.235
Return on Assets (ROA)	**.827**	.302
Sales growth rate	**.816**	.266
Return on Investment (ROI)	**.785**	.286
Controlling cost	**.719**	.400
Panel B2: Non-Financial Performance (α=0.884, mean=3.503)		
Number of new product launches	.241	**.883**
Number of warranty claims or customer complaints	.247	**.822**
Market share	.339	**.796**
Number of employee taking additional education or training	.350	**.749**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Eight new variables emerged from the factor analysis PEU, MCI, ST and CUL were used in binary logistic regression as independent variables for hypotheses testing. The other four variables which are organisational financial performance and organisational non-financial performance both before and after IIS implementation were used as dependent variables in multiple regression and moderated regression.

5.3 Spearman Correlation Analysis for Multiple Regression Analysis

Spearman correlation is used to test the association among variables which will be used with regression models to gain some insight into relationships as well as assess the absence of multicollinearity[37]. Table 5.4 presents a correlation matrix from application of Spearman correlation of contingent factors: PEU, MCI, organisational (differentiation) strategy, ST, CUL, IIS and two control variables: organisational size and business type. The results demonstrate positive relationships between pairs of variables: PEU and two variables: ST and size at moderate correlation of 0.416 and 0.401 with significant level of 0.01. PEU is also associated with organisational culture at a low correlation at 0.224, significant level at 0.05. The positive relationships between three pairs of variables: MCI and IIS, SG and ST, and size and ST are low at correlation of 0.205, 0.196 and 0.172 with significant level of 0.05. However, only a negative relationship between CUL and IIS was found at low correlation of 0.224 with significant level of 0.05. Other pairs of variables are not found to show an association. Several researchers (Hyvönen, 2007; Fayard *et al.*, 2012; Maiga *et al.*, 2014), hold that a correlation of 0.4 would assure the absence of multicollinearity when all variables are entered into the regression models.

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[37] Multicollinearity is an extent to which a variable can be explained by the other variables in the analysis Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010) *Multivariate data analysis : a global perspective*. 7th edn. Upper Saddle River, N.J. ; London : Pearson Education.

Table 5.4: Spearman Correlation Contingent Factors and Control Variables

(N=98)	PEU	MCI	SG	ST	CUL	IIS	Size	Type
PEU	1.00							
MCI	0.05	1.00						
SG	0.14	0.11	1.00					
ST	.416**	-0.14	.196*	1.00				
CUL	.224*	-0.09	-0.10	-0.08	1.00			
IIS	-0.12	.205*	0.05	0.03	-.229*	1.00		
Size	.401**	0.05	-0.03	.172*	0.12	0.11	1.00	
Type	-0.10	-0.07	-0.06	0.03	-0.02	-0.06	-0.08	1.00

** Correlation is significant at the 0.01 level (1-tailed), * Correlation is significant at the 0.05 level (1-tailed); Note: PEU=Perceived Environmental Uncertainty, MCI=Market Competition Intensity, SG=Organisational Strategies, ST=Organisational Structure, CUL=Organisational Culture, Integrated Information Systems (IIS), Size=Organisational Size, Type=Business Type

5.4 Logistic Regression: The Impact of Contingency Factors on Individual MAP Adoption

The impact of contingent factors including six independent variables: PEU, MCI, SG, ST, CUL and IIS and two control variables: organisational size and business type on individual MAP adoption is shown in Table 5-5. Most of contingent factors except CUL were expected to have a positive impact on MAP adoption. The overall results indicate findings the same as predicted. However, MCI shows an inconclusive impact on adoption of some MAPs whereas there is a negative impact of ST on the probability of MAP adoption. The adoption of nineteen MAPs: budgeting systems –coordinating activities across business unit; evaluating managers' performance; planning financial position, CVP, JIT, operations research techniques, SVA, long-range forecasting, strategic plans developed with budgets, cost of quality, kaizen costing, TC, and PE – CFROI; controllable profit; non-financial measures; ongoing supplier evaluations; production processes; qualitative measures; and ROI have not been found association with contingent factors. Therefore, an interpretation of results are explained based on thirty-eight of fifty-seven MAPs adoption which are significantly associated with six contingent factors.

In order to interpret the results, all remaining significant variables listed in table 5.5 are explained based on six independent variables: PEU, MCI, SG, ST, CUL and IIS. First, the results indicate that PEU has a positive significant impact on MAPs adoption. It is notable when organisations face high PEU, there is an increased use of the following MAPs:

budgeting systems–controlling cost; planning cash flow, benchmarking–operational process; management process; strategic priorities, value chain analysis, ABC, standard costing, and performance evaluations–BSC; and budget variance analysis. While, most of the MAPs use is associated with PEU, the use of MAPs in a LTP group is not significant at any level.

Next, the results indicate that MCI has both a positive and negative association with MAP adoption. The most noticeable positive relationship is BSC separate from PE. On the other hand, the adoption of budgeting systems–planning cash flow, product profitability analysis, formal strategic planning, and performance evaluation-customer satisfaction surveys; divisional profit; and team performance are negatively associated with MCI. However, the overall results show that there are significant negative relationships between MCI and the use of MAPs expect the PC group.

Third, the findings show some positive and significant impact of SG (differentiation) on adoption of some MAPs, including, budgeting systems–controlling cost, value chain analysis, strategic plans developed separately from budget, absorption costing, cost modelling, and throughput accounting. Thus, the more product differentiation strategy has been adopted, the more MAPs are adopted. However, whilst most of the MAPs use is associated with SG, the use of MAPs in a PE group is not significant at any level.

Fourth, ST is found to have a negative association with MAP adoption. This means that organisations with a decentralised structure and formalisation are less likely to adopt the following MAPs. These include budgeting systems–controlling cost; compensating managers; planning day-to-day operations, product life cycle analysis, CPA and PE-customer satisfaction survey. As MAP groups, there are three groups namely B, DSS and PE that have an association with organisational structure. No significant association has been found between ST and the number of MAP adoption in MAP groups of LTP and PC.

Fifth, CUL (power distance)[38] negatively influences the probability of MAP adoption. When an organisation's culture has a high power distance, organisations have a lower probability of the following MAPs adoption including ABB, budgeting systems-planning day-to-day operation, zero-based budgeting, ABM, BSC separately from PE, benchmarking product/service characteristics; operational process; carried out within/outside organisations, EVA, value chain analysis, formal strategic planning, strategic plans developed separately from budgets, ABC, PE–employee attitudes; residual income; and team performance.

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[38] Power distance refers to position important, obeying leaders, deferring to elders and inequality okay (House *et al.*, 2004, p.552)

Therefore, the results indicate that increasing levels of power distance decreases the probability of MAPs adoption.

Lastly, a positive significant impact of IIS implementation is found for some MAP adoption which are budgeting systems–controlling costs; planning cash flow, product profitability analysis, capital budgeting techniques–NPV; IRR; payback period, standard costing, and PE–budget variance analysis. It can imply that the more IIS implementation, the more MAPs are adopted.

Additionally, the findings of the control variables are significant to explain the probability of MAP adoption. Large firms tend to adopt MAPs (incl. zero-based budgeting, ABM, EVA, TQM, value chain analysis, formal strategic planning, variable costing and PE–residual income) more than small ones. None of those MAPs which have a relationship with firm's size are in a PE group. However, a significant and negative relation between an industry dummy variable and the probability of MAP adoption is found. The findings show that industrial/manufacturing firms adopt fewer MAPs than non-industrial firms, in particular ABB, budget systems-controlling cost; planning day-to-day operations, zero-based budgeting, ABM, EVA, value chain analysis, PE-divisional profit; and employee attitude. It can be noted that there is no association between industrial type and groups of LTP and PC.

Table 5.5: Binary Logistic Regression: The Impact of Contingent Factors on Individual MAPs

$$MAP_i = \alpha + \beta_1 PEU + \beta_2 MCI + \beta_3 SG + \beta_4 ST + \beta_5 CUL + \beta_6 IIS + \beta_7 Size + \beta_8 Type + \varepsilon$$

		Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Activity-based budgeting (ABB)	B	-1.888**	.174	.018	-.562	.061	-0.805***	.140	.252	-1.636*	0.185	0.29	84.7
Budgeting systems - controlling costs	B	1.528**	0.441**	.249	1.443**	-0.680*	-.083	1.229*	-.129	-1.035*	0.221	0.303	73.5
Budgeting systems - planning cash flows	B	0.276	0.513**	-0.326*	-.392	-.253	.073	1.240*	-.167	-.715	0.172	0.229	72.4
Budgeting systems - compensating managers	B	-.181	.190	.005	-.479	-0.875*	-.284	.197	-.163	-.900	0.115	0.164	79.6

	C^*	Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Budgeting systems - planning day-to-day operations	B	-.322	.175	-.045	-.458	-0.976**	-0.321*	-.336	-.046	-1.211*	0.127	0.186	76.5
Zero-based budgeting	B	-2.477***	-.340	-.042	.503	.100	-0.646***	-.941	0.493**	-2.985**	0.2	0.314	78.6
Activity-based management (ABM)	DSS	-2.120**	-.118	-.203	.038	.210	-0.673***	-.398	0.345*	-1.787*	0.162	0.254	78.6
Balance Scorecard (BSC) separate from performance evaluation	DSS	-2.090***	.110	0.482**	.379	-.261	-0.546***	-.564	.296	-.719	0.167	0.252	77.6
Benchmarking - product/service	DSS	-1.072	.316	-.053	-.161	-.092	-0.312	.184	.049	-.042	0.059	0.084	68.4

		Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
characteristics							*						
Benchmarking - operational process	DSS	-0.402	0.503**	-.036	-.708	-.037	-0.361*	.529	-.156	-.012	0.099	0.14	70.4
Benchmarking - management process	DSS	-0.584	0.506**	-.095	-.511	.032	-.166	.374	-.253	-.020	0.063	0.097	79.6
Benchmarking - strategic priorities	DSS	-1.103	0.466*	-.138	-.021	-.015	-.204	.514	-.063	.065	0.074	0.106	69.4
Benchmarking - carried out within the wider organisation	DSS	-2.871***	.140	.065	.154	.058	-0.571**	.064	.327	-1.850	0.119	0.213	85.7
Benchmarking - with outside organisations	DSS	-2.558***	.309	.319	.833	-.253	-0.507**	.139	.010	-.951	0.155	0.206	87.8

	C^*	Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Economic value added (EVA)	DSS	-1.666**	.263	-.155	.114	-.040	-0.383**	-.486	0.321*	-1.218*	0.136	0.198	77.6
Product life cycle analysis	DSS	-3.010***	0.197	-0.028	0.702	-0.683**	-0.235	-0.128	0.239	-0.089	0.073	0.13	87.8
Product profitability analysis	DSS	-1.675***	.277	-0.323*	.088	-.384	.121	1.169**	.059	.147	0.135	0.187	68.4
Total Quality Management (TQM)	DSS	-2.035***	.323	-.182	.302	.155	.111	.108	0.352**	.137	0.135	0.186	69.4
Value chain analysis	DSS	-2.884***	0.384*	-.159	1.045*	.052	-0.407**	-.573	0.4716**	-1.885**	0.159	0.245	77.6

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	C^*	Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Customer Profitability analysis (CPA)	DSS	-1.485**	-.031	.068	.059	-0.657*	.014	-.143	.128	.287	0.044	0.064	74.5
Capital budgeting techniques - Net present value (NPV)	LTP	-1.730**	.081	-.269	.100	-.018	.045	1.207**	.187	-.102	0.108	0.147	68.4
Capital budgeting techniques - Internal rate of return (IRR)	LTP	-1.189*	.129	-.199	-.060	-.028	.082	0.887*	.157	-.257	0.081	0.109	65.3
Capital budgeting techniques - Payback period	LTP	-1.273*	.170	-.273	-.015	-.209	.003	0.923*	.113	-.364	0.097	0.132	69.4
Formal strategic planning	LTP	-2.098***	.082	-0.571***	-.164	-.063	-0.373**	-.159	0.549***	-.286	0.212	0.292	75.5

	C^*	Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Strategic plans developed separately from budgets	LTP	-3.457***	.453	.350	1.585*	.309	-0.456*	1.222	-.151	-.815	0.18	0.322	86.7
Absorption costing	PC	0.197	.001	.127	0.764*	-.299	-.236	.111	-.119	-.471	0.094	0.12	66.3
Activity-based costing (ABC)	PC	-0.576	0.401**	-.080	-.392	.193	-0.369**	.490	.074	-.199	0.107	0.144	65.3
Cost modelling	PC	-.719	-.012	-.171	0.836*	-.089	.004	-.027	-.019	-.716	0.062	0.084	64.3
Standard costing	PC	.399	0.547***	-.144	-.573	.494	-.142	1.152*	-.242	.290	0.141	0.182	63.3
Throughput accounting	PC	-2.837***	-.118	.200	1.179*	.010	-.292	-.097	.160	-1.004	0.087	0.152	83.7
Variable costing	PC	-2.797***	-.260	.017	.194	.277	-.258	.275	0.481**	-.388	0.111	0.164	76.5

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	C^*	Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Performance evaluation - balanced scorecard (BSC)	PE	-.878	0.432**	.104	.052	-.472	-.245	.235	.094	-.549	0.123	0.167	66.3
Performance evaluation - budget variance analysis	PE	-.050	0.458**	-.102	-.280	-.121	-.194	0.927*	-.178	.001	0.107	0.143	68.4
Performance evaluation - customer satisfaction surveys	PE	-1.061	.129	-0.347*	.306	-0.650*	-.059	.294	.059	-.897	0.127	0.177	69.4
Performance evaluation - divisional profit	PE	-1.096	.305	-0.408**	-.046	-.323	-.191	.548	.014	-1.155*	0.137	0.196	70.4

	C^*	Constant	PEU	MCI	SG	ST	CUL	IIS	Size	Type	Cox & Snell R^2	Nagelkerke R^2	Predicted (Overall %)
Predicted Sign	C^*		+	+	+	+	-	+	NP	NP	NP	NP	NP
Performance evaluation - employee attitudes	PE	-2.7886***	.029	.081	.864	-.217	-0.624**	-.066	.146	-2.088*	0.123	0.226	84.7
Performance evaluation - residual income (e.g. interest adjusted profit)	PE	-2.935***	-.106	-.108	.652	.118	-0.389*	.134	.336	-2.082*	0.11	0.187	82.7
Performance evaluation - team performance	PE	-.944	.250	-0.474**	.123	-.376	-0.406**	.475	-.086	-.962	0.167	0.239	76.5

* $p < 0.10$, **$p < 0.05$, *** $p < 0.01$

Note:

C^* = Categories, B=Budgeting System, DSS=Decision Support Systems, LTP=Long Term Planning, PC=Product Costing, PE=Performance Evolutions, NP=Not Predicted, PEU=Perceived Environmental Uncertainty, MCI=Market Competition Intensity, SG=Organisational Strategies, ST=Organisational Structure, CUL=Organisational Culture, Integrated Information Systems (IIS), Size=Organisational Size, Type=Business Type

5.4.1 Summary of the Research Findings Relating to Factors Influencing the Individual MAP Adoption

The findings illustrate the relationships between the adoption of MAPs and contingent variables namely PEU, MCI, SG, ST, CUL and IIS. The statistical analyses reveal that most logistic regression coefficient signs for PEU, SG, ST, CUL and IISs are in the same direction as predicted in the hypotheses development. Nevertheless, the MCI variable provides a negative sign for the use of MAPs, only BSC separate from PE shows a positive significant association with MCI. The findings results are summarised in table 5.6.

In line with expectations, PEU, differentiation strategy and IIS have a positive association with MAP adoption. For the PEU, the findings indicate that under high environmental uncertainty managers need an internal information source like MA information to monitor, keep a number of current customers and maintain competitive advantages (Paolo and Andrea, 2010). This finding is consistent with Gordon and Miller (1976) who indicated that when a high level of environmental uncertainty exists managers tend to increase demands for MA information, either financial or non-financial information, for making decision. Similarly, Nimtrakoon and Tayles (2010) revealed that firms facing high PEU will use more MA data.

This study found that the probability of MAP adoption is higher in organisations which put an emphasis on differentiation strategy. These findings confirm a study of (Chenhall and Langfield-Smith, 1998b); organisations that operate under product differentiation strategies may gain benefits from MAPs such as benchmarking, strategic planning techniques and activity-based techniques. In contrast, Abdel-Kader and Luther (2008) found no supporting evidence that differentiation strategy had any influence.

Next, the findings reveal that there are positive relationships between the probability of MAP adoption and IIS implementation. This is consistent with a study of Haldma and Lääts (2002). They indicated that the effectiveness of accounting system' design including MAPs depends on its ability to adapt to changes in business circumstances, especially with those in technology. Chapman and Kihn (2009) and Rom and Rohde (2006) explained that IIS implementation would support data collection facilitating the use of MAPs in particular areas of B and PC. Although IIS implementation caused changes in MA and control procedures but the changes were relatively small due to advanced and conventional MAPs being operated in separate systems (Granlund and Malmi, 2002).

Conversely, there are few selected contingent variables which impede MAP adoption: ST and CUL. These imply that the adoption of MAPs is seen as a lower priority with decentralised

power and high power distance culture values (i.e. obeying leaders and bureaucratic management style). The findings confirm a study of Paolo and Andrea (2010) who found that MA systems are considered as useless and extremely expensive in companies which operate under a lack of decentralised power and management by objectives. Gosselin (1997) argues that centralisation and formalisation which are part of ST are associated with ABC implementation. On the other hand, this study found that organisational culture-high level of power distance impede MAP adoption. This is inconsistent with Gosselin's (1997) study which indicated that the level of bureaucracies in organisations has a positive impact on ABC adoption. Alternatively, Kittiya and James (2009) suggested that BSC will be adopted with Thai style before adoption and use in Thai companies. For example, some Thai companies implemented the BSC, but did not employ cause-and-effect relationships. This might be one of the reasons there is the negative relationship between CUL and MAP adoption.

An inconclusive finding has been found the relationship between MCI and MAP adoption. The MCI has a negative impact on most MAP adoption but it has a positive association with DSS. It has no impact on MAPs in a group of PC. Comparing the findings of previous related studies, this study, similar to Al-Omiri (2003), shows there is a negative relationship between firms facing strong competition and MAP adoption because high MCI firms might be more cost conscious and reluctant to invest in costly accounting systems when it cannot be clearly demonstrated that such investments will yield positive short-term returns. Similarly, Kennedy and Fiss (2009) indicated that MCI seems to be an obstacle to an adoption of PE for team performance. This study's findings are also consistent with Clara Xiaoling et al. (2015) who revealed that the more competition intensity in an organisation the greater the use of non-financial measures particularly measures of customer satisfaction.

Moreover, PEU and organisational structure variables cannot explain the probability of adoption of MAPs in the LTP group. The probability of adoption of PC cannot explain using MCI and a decentralised structure. Differentiation strategy cannot explain the probability of adoption of MAPs in PE. Consequently, the findings in these sections support the relationships between PEU, SG, CUL and IIS in Hypothesis H1, H3, H5 and H6 but reject H4. In addition, the evidence is inconclusive to support hypothesis H2.

Table 5.6: Summary of the Results of Binary Logistic Regression

Contingent factors MAPs	PEU (+)	MCI (-)	SG (+)	ST (-)	CUL (-)	IIS (+)
Budgeting Systems	• Controlling costs • Planning cash flows	• Planning cash flows	• Controlling costs	• Controlling costs • Compensate managers • Planning day-to-day operations	• ABB • Planning day-to-day operations • Zero-based Budgeting	• Controlling costs • Planning cash flows
Decision Support Systems	• Benchmarking-operational process • Benchmarking-management process • Benchmarking-strategic priorities • Value chain analysis	• BSC separately from performance evaluation (+) • Product profit analysis	• Value chain analysis	• Product life cycle analysis • Customer profitability analysis	• ABM • Balanced Scorecard separately from PE • Benchmarking-product/service characteristics • Benchmarking-operational process	• Product profit analysis

Contingent factors / MAPs	PEU	MCI	SG	ST	CUL	IIS
	(+)	(-)	(+)	(-)	(-)	(+)
					• Benchmarking- carried out within and outside organisations • EVA • Value chain analysis	
Long-term Planning	No significance	• Formal strategic planning	• Strategic plans develop separate from budgets	No significance	• Formal strategic planning • Strategic plans develop separate from budgets	• Capital budgeting techniques- NPV; -IRR; - payback period
Product Costing	• ABC • Standard costing	No significance	• Absorption Costing • Cost modelling • Throughput accounting	No significance	• ABC	• Standard Costing

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Contingent factors	PEU	MCI	SG	ST	CUL	IIS
MAPs	(+)	(-)	(+)	(-)	(-)	(+)
Performance Evaluations	• BSC • Budget variance analysis	• Customer satisfaction surveys • Division Profit • Team performance	No significance	• Customer satisfaction surveys	• Employee attitudes • Residual income • Team performance	• Budget variance analysis

(+) Positive Significant findings, (-) Negative Significant findings, PEU = Perceived Environmental Uncertainty, MCI = Intensity of Market Competition, SG = Organisational Strategy, ST = Organisational Structure, CUL = Organisational Culture, IIS = Integrated Information Systems

5.5 Multiple Regression: The Impact of MAPs, IISs, and Interaction between MAP and IIS on Organisational Performance

The impact of specific MAP adoption such as ABC and performance measurement techniques on OP has been reported as an inconclusive result (Kennedy and Affleck-Graves, 2001; Cagwin and Bouwman, 2002; Hyvönen, 2007; Kober *et al.*, 2012).

> "There has not been much research on non-financial management accounting systems...Also, more work on non-financial measures is needed." (Hyvönen, 2007)

It is worth expanding the investigation into different categories of MAPs, namely in five groups; B, DSS, LTP, APE and PC (Chenhall and Langfield-Smith, 1998a; Vaivio, 1999; Angelakis *et al.*, 2010). This section focuses on the impact of MAP adoption, IIS implementation and the interaction effects of them on OP (both financial and non-financial).

Overlapping between a group of categories and managing missing data are an emphasis of this study. MAPs have been classified into different categories: conventional versus advanced. Exploratory factor analysis was applied to explore the underlying correlations and reduce dimensionality among a large number of variables (Hair *et al.*, 2009). However, according to the questionnaires, the respondents were asked to indicate the degree of perceived satisfaction based on a scale of 1 to 5 from a list of fifty-seven MAPs. If the respondents have not adopted MAPs, they were asked to leave the questionnaire blank. There are more than 40% in each practice which would represent either not adopted or missing data[39]. Given the nature of this research and questionnaire design, it is almost impossible to delete missing value cases or imputation by using replacement values. Thus, the respondent's scales were collapsed into 2 categories in order to resolve the issue of missing data and keep the questionnaire valid. The blank data are assigned the value of 0. If the respondents gave at least one scale meaning adopted MAPs, the value of 1 is assigned (Albu and Albu, 2012). There are six groups of MAPs categorized following those used by Chenhall and Langfield-Smith (1998a) and Angelakis *et al.* (2010) also based on constructs performed by factor analysis. However, some MAPs were extracted by factor analysis because techniques/variables might have a lot of blank answers so they are associated uniquely with a single variable or techniques/variables and might have a correlation with more than one construct. MAPs which are included in this study consist of six constructs: budgeting systems (B), product costing (PC), conventional performance evaluation (CPE), advanced performance evaluation (APE), long-term planning (LTP), and decision support systems (DSS) are grouped from the fifty-seven MAPs list (Table

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[39] Tabachnick and Fidell (2013) suggest that missing data should not be more than 5% to estimate or predict using only valid data.

5.7). The first construct is budgeting techniques (B) includes five variables: compensating managers, controlling costs, coordinating activities across the business unit, planning day-to-day operations, and planning cash flows. The second construct is DSS including benchmarking–product/service characteristics; operational process; strategic priorities; carried out within the wider organization; and outside organizations. The third construct is LTP which contains five measured variables including capital budgeting techniques–NPV; IRR; Payback period, formal strategic planning, and long range forecasting. The fourth construct is PC measured by ABC, cost of quality, cost modelling, kaizen costing, TC, and throughput accounting. The fifth construct provides a measure for conventional performance evaluation (CPE): budgeting variance analysis, CFROI, controllable profit, divisional profit, residual income (e.g. interest adjusted profit), and ROI. Lastly, advanced performance evaluation (APE) is measured by BSC, customer satisfaction surveys, and team performance. All six constructs are estimated of the reliability of data by using Cronbach's alpha which should be more than 0.7 (Nunnally, 1994; Hair *et al.*, 2009). The Cronbach's alpha of each factor is 0.852, 0.902, 0.908, 0.719, 0.854 and 0.803 respectively. The results were aggregated and used in regression models shown below to represent the frequency of MAPs in each group.

Table 5.7: Factor Analysis and Reliability for Groups of MAPs

Budgeting Systems (α = 0.852)

- Compensating managers
- Controlling costs
- Coordinating activities across the business unit
- Planning day-to-day operations
- Planning cash flows

Decision Support Systems (α = 0.902)

- Benchmarking – product/service characteristics
- Benchmarking – operational process
- Benchmarking – strategic priorities
- Benchmarking – carried out within the wider organization
- Benchmarking – with outside organizations

Long-term Planning (α = 0.908)

- Capital budgeting techniques – NPV
- Capital budgeting techniques – IRR
- Capital budgeting techniques – Payback period

- Formal strategic planning
- Long range forecasting

Product Costing (α = 0.719)

- ABC
- Cost of quality
- Cost modelling
- Kaizen costing
- Target costing
- Throughput accounting

Conventional Performance Evaluation (α = 0.854)

- Budgeting variance analysis
- CFROI
- Controllable profit
- Divisional profit
- Residual income (e.g. interest adjusted profit)
- Return (profit) on investment

Advanced Performance Evaluation (α = 0.803)

- BSC
- Customer satisfaction surveys
- Team performance

5.5.1 Multiple Regression Analysis Testing for a Relationship between the Use of MAPs and Organisational Performance

In this section, the multiple regression analysis seeks to answer the research questions which address the third objective of this study "to evaluate the impact on organisational performance of adoption of MAPs, integrated information". The multiple regression model is used to facilitate the analysis using OP as dependent variables and groups of MAP adoption as independent variables. Factor analysis is applied to classified OP into four groups: financial performance before/after IIS implementation and non-financial before/after IIS implementation. Then, all variables which will be used in regression analysis are put into correlation analysis to explore the correlations amongst variables.

The number of MAP adoption as independent variables are categorised into six groups: B, DSS, LTP, PC, CPE and APE. The dependent variable, OP, is measured as financial

performance and non-financial performance using exploratory factor analysis (Hyvönen, 2007; Chapman and Kihn, 2009).

➢ *Correlation Analysis for Multiple Regression Analysis*

Spearman correlation analysis in table 5.8 show the relation between groups of MAP adoption and OP before implementations of IISs. The results show positive associations between pairs of variables. Correlation coefficients show a weak relationship with a correlation coefficient less than 0.4. Most groups of MAP adoption: B, DSS, LTP, CPE and APE are positively associated with financial performance of organisations whereas there is no significant relationship between a group of PC and organisational financial performance. All groups of MAP adoption are associated with non-financial performance of organisations which have not implemented IIS yet.

After IIS was implemented, the relationships between groups of MAP adoption and organisational performance are shown in table 5.9. IIS implementation and the number of MAP adoption in four groups of MAP adoption namely B, LTP, CPE and APE are positively associated with financial performance of organisations. On the other hand, IIS implementation and the number of MAP adoption in LTP and CPE are positively associated with non-financial performance of organisations. A possible explanation for non-significant correlation coefficients between all groups of MAP adoption and non-financial performance after IIS implementation is that none of the MAP adoption have a linear relationship with the perceived benefits from non-financial performance of organisations.

Table 5.8: Spearman Correlation Organisational Performance (before IIS Implementations), MAP Adoption and Control Variables

(N=98)	B	DSS	LTP	PC	CPE	APE	Size	Type	OP-Fin BIIS	OP-NonFin BIIS
B	1.000									
DSS	.549[**]	1.000								
LTP	.702[**]	.670[**]	1.000							
PC	.603[**]	.816[**]	.678[**]	1.000						
CPE	.759[**]	.665[**]	.785[**]	.691[**]	1.000					
APE	.716[**]	.659[**]	.667[**]	.654[**]	.818[**]	1.000				
Size	.103	.238[**]	.271[**]	.186[*]	.134	.163	1.000			
Type	-.202[*]	-.072	-.077	-.105	-.111	-.113	-.081	1.000		
OP-Fin BIIS	.339[**]	.240[**]	.220[*]	.151	.269[**]	.356[**]	.201[*]	-.003	1.000	
OP-NonFin BIIS	.183[*]	.315[**]	.256[**]	.376[**]	.296[**]	.254[**]	.083	-.018	-.041	1.000

**Correlation is significant at the 0.01 level (1-tailed), * Correlation is significant at the 0.05 level (1-tailed); Note: B=Budgeting systems, DSS=Decision Support Systems, LTP=Long Term Planning, PC=Product Costing, CPE=Conventional Performance Evaluations, APE=Advanced Performance Evaluations, IIS=Integrated Information Systems Implementation, Size=Organisational Size measured by the number of employees, Type=Business type, OP-Fin BIIS=Financial organisational performance before IIS implementation, OP-NonFin BIIS=Non-financial organisational performance before IIS implementation

Table 5.9: Spearman Correlation Organisational Performance (after IIS Implementations), MAP Adoption and Control Variables

	B	DSS	LTP	PC	CPE	APE	IIS	Size	Type	OP-Fin AIIS	OP-NonFin AIIS
B	1.000										
DSS	.549**	1.000									
LTP	.702**	.670**	1.000								
PC	.603**	.816**	.678**	1.000							
CPE	.759**	.665**	.785**	.691**	1.000						
APE	.716**	.659**	.667**	.654**	.818**	1.000					
IIS	.218*	.138	.170*	.123	.242**	.168*	1.000				
Size	.103	.238**	.271**	.186*	.134	.163	.112	1.000			
Type	-.202*	-.072	-.077	-.105	-.111	-.113	-.059	-.081	1.000		
OP-Fin AIIS	.203*	.086	.213*	.088	.288**	.185*	.170*	.110	.054	1.000	
OP-NonFin AIIS	.067	.150	.168*	.165	.191*	.155	.244**	.075	.173*	-.006	1.000

**Correlation is significant at the 0.01 level (1-tailed), * Correlation is significant at the 0.05 level (1-tailed)

Note: B=Budgeting systems, DSS=Decision Support Systems, LTP=Long Term Planning, PC=Product Costing, CPE=Conventional Performance Evaluations, APE=Advanced Performance Evaluations, IIS=Integrated Information Systems Implementation, Size=Organisational Size measured by the number of employees, Type=Business type, OP-Fin AIIS=Financial organisational performance after IIS implementation, OP-NonFin AIIS=Non-financial organisational performance after IIS implementation

Correlation analysis reveals the strength or the weakness of the relationship between two variables without determining which variable is dependent and which variable is independent. Thus causality might not be explained. Consequently, further analysis will be made to investigate causal effects of relationships between the dependent variables: OP, the independent variables: MAP adoption and IIS implementation, control variables: organisational size, and business type using multiple regression analysis[40].

5.5.2 Organisational Performance (before Implemented IISs) and MAP Adoption

The multiple regression models below are used to test the association between the number of MAP adoption and OP. The number of MAP adoption are the independent variables which are categorised into six groups: B, DSS, LTP, PC, CPE and APE. Dependent variables are OP: financial performance and non-financial performance.

The regression models below are used to test the impact of the number of MAP adoption on OP (Table 5.29). It is noted that the organisational performances are derived from factor analysis. Each group of MAP represents the aggregated number of MAP adoption. While, company size which was measured by number of employees and business type focusing on whether the type of a company is industry or not are control variables in order to make the results more accurate.

The regression assumptions are tested by using standardised residual values and Laverage test after the regression models were estimated. If substantial violations to the assumptions are found, corrective actions and re-estimation of the regression model are required (Hair *et al.*, 2009). However, no serious assumption violation has been found. The following regressions are analysed using the following equations.

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[40] Multicollinearity (chapter three, section 3.8.2) have been investigated by using correlation analysis before compute multiple regression analysis.

$$OP_i = \alpha + \beta_1 MAP_i + \beta_2 Size + \beta_3 Type + \varepsilon \ \ldots\ldots\ldots\ldots(1)$$

Where

OP_i	=	Operational performance before implemented IISs; i = financial performance, non-financial performance
α	=	intercept
$\beta_1 MAP_i$	=	Linear effect of MAP$_i$; i = budgeting system (B), product costing (PC), conventional performance evaluation (CPE), advanced performance evaluation (APE), long-term planning (LTP), and decision support system (DSS)
$\beta_2 Size$	=	Linear effect of company size
$\beta_3 Type$	=	Linear effect of business type
ε	=	Error term, mean of zero

There are three key statistic values which assess the fitness of the overall model. First, the coefficient of determination (R^2) indicates the amount of variance in the dependent variable explained by the model. Second, adjusted coefficient of determination (adjusted R^2) identifies the possible variation in the emphasis placed on dependent variables associated with a set of independent variables. Third, the F ratio represents the amount of variation explained by the regression model is better that the baseline prediction which is R^2 more than zero at the significant level (Hair *et al.*, 2009). Moreover, t values which are determined by the coefficient divided by the standard error represent the number of standard errors that the coefficient differs from zero. A regression coefficient significantly different from zero meaning no zero included in the confidence interval or estimated coefficient. Using SPSS version 22 one obtains constant values, regression coefficients, t test, and the significant value of the t test.

The interpretation of the results from equation 1 is presented in two sections based on dependent variables: financial performance and non-financial performance (Table 5.3). The significant results are presented in table 5.10 – 5.15 where a firm's financial performance is used as the dependent variable. As six groups of MAPs (Table 5.7), only a group of product costing shows no significant association with financial performance. Budgeting systems, conventional PE, advanced PE, LTP, and DSS show significant impact on financial performance. However, table 5.16 – 5.20 also shows a significant impact from the use of MAPs on a firm's non-financial performance. The results demonstrate five groups of MAPs which are PC, conventional PE, advanced PE, LTP, and DSS are significantly positively

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associated with non-financial performance. No impact of the budgeting system on non-financial performance has been found by this study. All significant regression models and interpretation of the regression equations are shown as follow.

➢ *Financial Performance of Organisation before IIS Implementation*

The results presented in table 5.10 – 5.14 indicate the impact of the number of MAP adoption on financial performance before IIS implementation. Each model shows a positive significant relationship between the numbers of MAP adoption: B, CPE, APE, LTP, and DSS and the organisational financial performance. Moreover, organisational size as the control variable is significantly and positively associated with organisational financial performance before IIS implementation. Nevertheless, business type which measures whether or not organisational type is an industry type is not statistically significant on all the regression models. It implies that the industry type has no general effect on organisational financial performance before IIS implementation so it has no explanatory value.

Table 5.10: Multiple Regressions: The Impact of the Number of Budgeting System Adoption on Organisational Performance (Financial) before Implemented IISs

Equation 5-1: $OP_{Fin} = \alpha + \beta_1 \text{Budgeting Systems} + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.804	.241		-3.343	.001		
B	.142	.040	.343	3.565	.001	.964	1.037
Size	.135	.063	.204	2.148	.034	.986	1.014
Business type	.211	.220	.092	.957	.341	.957	1.044
Coefficient of Determination R^2	.162						
Adjusted R^2	.135						
Std. Error of the Estimate	.9301						
F	6.042						
Sig.	.001						

Equation 5-1, there are 13.5 percent (adjusted R^2) of possible variation in the emphasis based on organisational financial performance before IIS implementation is associated with a group of budgeting systems. With F value of 6.042 at a significant level of 0.001, the estimated equation model is shown as

Financial performance = -0.804+0.142B+0.135Size+0.211Type.......(5-1)

The regression coefficient of a group of budgeting systems of 0.142 and organisational size of 0.135 are significantly different from zero with the t value of 3.565 and 2.148, respectively. This result implies that if the organisations adopt one more unit of budgeting systems, their organisational financial performance before IIS implementation is expected to increase by 0.142 units with a high degree of certainty (99%, $p<0.01$). At a significance level of 95% ($p<0.05$), it may be concluded that if organisations increase the number of employees by one more unit, financial performance before IIS implementation of organisations is expected to increase by 0.135 units.

Table 5.11: Multiple Regressions: The Impact of the Number of Conventional Performance Evaluation Adoption on Organisational Performance (Financial) before Implemented IISs

Equation 5-2: $OP_{Fin} = \alpha + \beta_1 \text{Conventional Performance Evaluation} + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.638	.236		-2.702	.008		
CPE	.121	.046	.260	2.643	.010	.976	1.025
Size	.131	.065	.197	2.013	.047	.980	1.020
Business type	.142	.224	.062	.632	.529	.975	1.026
Coefficient of Determination R^2	.114						
Adjusted R^2	.086						
Std. Error of the Estimate	.9561						
F	4.038						
Sig.	.010						

Equation 5-2, there is an 8.60 percent (adjusted R^2) of possible variation in the emphasis based on organisational financial performance before IIS implementation is associated with a group of conventional performance evaluations. With an F value of 4.038 at a .010 significance level, the estimated equation model is shown as (5-2).

Financial performance = -0.638+0.121CPE+0.131Size+0.142Type ....(5-2)

The regression coefficient of a group of conventional performance evaluations of 0.121 and organisational size of 0.131 are significantly different from zero with the t value of 2.643 and 2.013, respectively. It implies that if the organisations adopt one more unit of conventional PE, their organisational financial performance before IIS implementation is expected to increase for 0.121 units with the high degree of certainty (99%, p<0.01). At a significance level of 95% (p<0.05), it can be concluded that organisations increasing the number of

employees by one more unit improve financial performance before IIS implementation by 0.131 units.

Table 5.12: Multiple Regressions: The Impact of the Number of Advanced Performance Evaluation Adoption on Organisational Performance (Financial) before Implemented IISs

Equation 5-3: $OP_{Fin} = \alpha + \beta_1 \text{Advanced Performance Evaluation} + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.622	.232		-2.681	.009		
APE	.114	.040	.277	2.836	.006	.977	1.024
Size	.131	.065	.198	2.032	.045	.981	1.019
Business type	.148	.223	.065	.663	.509	.974	1.027
Coefficient of Determination R^2	.123						
Adjusted R^2	.095						
Std. Error of the Estimate	.9511						
F	4.407						
Sig.	.006						

Equation 5-3, there is a 9.5 percent (adjusted R²) of possible variation in the emphasis based on organisational financial performance before IIS implementation is associated with a group of advanced PE. With F value of 4.407 at significance level of 0.006, the estimated equation model is shown as

Financial performance = -0.622+0.114APE+0.131Size+0.148Type........(5-3)

The regression coefficient of a group of advanced PE of 0.114 and organisational size of 0.131 are significantly different from zero with the t value of 2.836 and 2.032, respectively. It implies that if the organisations adopt one more unit of advanced PE, their organisational financial performance before IIS implementation is expected to increase for 0.114 units with the high degree of certain (99%, p<0.01). As significant level of 95% (p<0.05),

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organisational size can be concluded that if organisations increase the number of employees by one more unit, financial performance of organisations before IIS implementation is expected to increase for 0.131 units.

Table 5.13: Multiple Regressions: The Impact of the Number of Long-term Planning Adoption on Organisational Performance (Financial) before Implemented IISs

Equation 5-4: $OP_{Fin} = \alpha + \beta_1 \text{Long} - \text{term Planning} + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.531	.234		-2.268	.026		
LTP	.087	.049	.181	1.783	.078	.947	1.056
Size	.119	.068	.180	1.765	.081	.939	1.065
Business type	.086	.227	.038	.379	.706	.939	1.013
Coefficient of Determination R^2	.079						
Adjusted R^2	.050						
Std. Error of the Estimate	.9746						
F	2.705						
Sig.	.050						

Equation 5-4, there is a 5.0 percent (adjusted R^2) of possible variation in the emphasis based on organisational financial performance before IIS implementation is associated with a group of LTP. With F value of 2.705 at significance level of 0.05, the estimated equation model is shown as

Financial performance = -0.531+0.087LTP+0.119Size+0.086Type........(5-4)

The regression coefficient of a group of LTP of 0.087 and organisational size of 0.119 are significantly different from zero with the t value of 1.783 and 1.765, respectively. It implies that if the organisations adopt one more unit of LTP, their organisational financial performance before IIS implementation is expected to increase for 0.087 units with a high degree of likelihood (90%, p<0.1). At a significance level of 90% (p<0.1), it may be

concluded that if organisations increase the number of employees by one more unit, financial performance of organisations before IIS implementation is expected to increase by 0.119 units.

Table 5.14: Multiple Regressions: The Impact of the Number of Decision Support Systems Adoption on Organisational Performance (Financial) before Implemented IISs

Equation 5-5: $OP_{Fin} = \alpha + \beta_1 Decision\ Support\ Systems + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.568	.236		-2.411	.018		
DSS	.064	.031	.204	2.041	.044	.969	1.032
Size	.127	.066	.191	1.911	.059	.967	1.034
Business type	.111	.227	.049	.491	.625	.981	1.019
Coefficient of Determination R^2	.089						
Adjusted R^2	.060						
Std. Error of the Estimate	.9697						
F	3.050						
Sig.	.032						

Equation 5-5, there is a 6.0 percent (adjusted R^2) of possibility variation in the emphasis based on organisational financial performance before IIS implementation is associated with a group of DSS. With F value of 3.050 at significance level of 0.032, the estimated equation model is shown as

Financial performance = -0.568+0.064DSS +0.127Size+0.111Type........(5-5)

The regression coefficient of a group of DSS of 0.064 and organisational size of 0.127 are significantly different from zero with the t value of 2.041 and 1.911, respectively. The t-values imply that if the organisations adopt one more unit of DSS, their organisational financial performance before IIS implementation is expected to increase by 0.064 units with a high degree of probability (95%, $p<0.05$). At a significance level of 90% ($p<0.1$), it may be

concluded that if organisations increase the number of employees by one more unit, financial performance of organisations before IIS implementation is expected to increase by 0.127 units.

> ### *Non-Financial Performance of Organisations before IIS Implementation*

On the other hand, the results which are presented in table 5.15 – 5.19 indicate the impact of the number of MAP adoption on non-financial performance before IIS implementation (table 5.3, panel A2). Each model shows a positive significant relationship between the number of MAP adoption and the organisational non-financial performance. The results reveal five MAPs which are PC, conventional PE, advanced APE, LTP, and DSS have a positive significant impact on non-financial performance of organisations. Nevertheless, organisational size which was measured by the number of employees and business type which measure whether or not organisational type is an industry type are not statistically significant on all the regression models. It implies that the organisational size and the industry type have no effect on organisational non-financial performance before IIS implementation so these variables have no explanatory value.

Table 5.15: Multiple Regressions: The Impact of the Number of Product Costing on Organisational Performance (Non-financial) before Implemented IISs

Equation 5-6: $OP_{Non-Fin} = \alpha + \beta_1 Product\ Costing + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.358	.239		-1.498	.137		
PC	.149	.056	.264	2.638	.010	.979	1.021
Size	.048	.066	.072	.718	.475	.976	1.024
Business type	-.007	.228	-.003	-.030	.976	.982	1.019
Coefficient of Determination R^2	.079						
Adjusted R^2	.050						
Std. Error of the Estimate	.9746						
F	2.705						
Sig.	0.050						

Equation 5-6, there is a 5.0 percent (adjusted R^2) of possible variation in the emphasis based on organisational non-financial performance before IIS implementation is associated with a group of PC. With F value of 2.705 at significant level of 0.05, the estimated equation model is shown as

Non-Financial performance = -0.358+0.149PC+0.048Size-0.007Type........(5-6)

The regression coefficient of a group of PC of 0.149 is significantly different from zero with the t value of 2.638. It implies that if organisations adopt one more unit of PC, their organisational non-financial performance before IIS implementation is expected to increase by 0.149 units with a high probability, i.e. (99%, p<0.01).

Table 5.16: Multiple Regressions: The Impact of the Number of Conventional Performance Evaluation on Organisational Performance (Non-financial) before Implemented IISs

Equation 5-7: $OP_{Non-Fin} = \alpha + \beta_1 Conventional\ Performance\ Evaluation + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.378	.241		-1.571	.120		
CPE	.124	.047	.266	2.651	.009	.976	1.025
Size	.051	.066	.077	.769	.444	.980	1.020
Business type	.016	.229	.007	.070	.944	.975	1.026
Coefficient of Determination R^2	.080						
Adjusted R^2	.051						
Std. Error of the Estimate	.9743						
F	2.728						
Sig.	0.048						

Equation 5-7, there is a 4.8 percent (adjusted R^2) of possibility variation in the emphasis based on organisational non-financial performance before IIS implementation is associated with a group of conventional PE. With F value of 2.728 at significant level of 0.048, the estimated equation model is shown as

Non-Financial performance = -0.378+0.124CPE+0.051Size+0.016Type........(5-7)

The regression coefficient of a group of conventional PE of 0.124 is significantly different from zero with the t value of 2.651. This implies that if the organisations adopt one more unit of conventional PE, their organisational non-financial performance before IIS implementation is expected to increase by 0.124 units with a high degree of probability (99%, p<0.01).

Table 5.17: Multiple Regressions: The Impact of the Number of Advanced Performance Evaluation on Organisational Performance (Non-financial) before Implemented IISs

Equation 5-8: $OP_{Non-Fin} = \alpha + \beta_1 Advanced\ Performance\ Evaluation + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.484	.235		-2.056	.043		
APE	.109	.041	.265	2.671	.009	.977	1.024
Size	.098	.065	.148	1.493	.139	.981	1.019
Business type	.024	.226	.010	.105	.917	.974	1.027
Coefficient of Determination R^2	.098						
Adjusted R^2	.070						
Std. Error of the Estimate	.9646						
F	3.420						
Sig.	0.020						

Equation 5-8, there are 7.0 percent (adjusted R^2) of possibility variation in the emphasis based on organisational non-financial performance before IIS implementation is associated with a group of advanced PE. With F value of 3.420 at significant level of 0.020, the estimated equation model is shown as

Non-Financial performance = -0.484+0.109APE+0.098Size+0.024Type......(5-8)

The regression coefficient of a group of conventional PE of 0.109 is significantly different from zero with the t value of 2.671. implying that if the organisations adopt one more unit advanced PE, their organisational non-financial performance before IIS implementation is expected to increase by 0.109 units with a high degree of likelihood, i.e. (99%, p<0.01).

Table 5.18: Multiple Regressions: The Impact of the Number of Long-term Planning on Organisational Performance (Non-financial) before Implemented IISs

Equation 5-9: $OP_{Non-Fin} = \alpha + \beta_1 Long - term\ Planning + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.432	.233		-1.855	.067		
LTP	.119	.048	.249	2.456	.016	.947	1.056
Size	.075	.067	.114	1.118	.266	.939	1.065
Business type	-.030	.226	-.013	-.131	.896	.987	1.013
Coefficient of Determination R^2	.088						
Adjusted R^2	.059						
Std. Error of the Estimate	.9699						
F	3.041						
Sig.	0.033						

Equation 5-9, there are 5.9 percent (adjusted R^2) of possible variation in the emphasis based on organisational non-financial performance before IIS implementation is associated with a group of LTP. With F value of 3.041 at significant level of 0.033, the estimated equation model is shown as

Non-Financial performance = -0.432+0.119LTP+0.075Size-0.03Type........(5-9)

The regression coefficient of a group of LTP of 0.119 is significantly different from zero with the t value of 2.456. These values imply that if the organisations adopt one more unit LTP, their organisational non-financial performance before IIS implementation is expected to increase for 0.119 units with a high degree of certainty (95%, $p < 0.05$).

Table 5.19: Multiple Regressions: The Impact of the Number of Decision Support Systems on Organisational Performance (Non-financial) before Implemented IISs

Equation 5-10: $OP_{Non-Fin} = \alpha + \beta_1 Decision\ Support\ Systems + \beta_2 Size + \beta_3 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.346	.236		-1.464	.147		
DSS	.086	.031	.274	2.734	.007	.969	1.032
Size	.040	.066	.061	.609	.544	.967	1.034
Business type	-.003	.227	-.001	-.012	.990	.981	1.019
Coefficient of Determination R^2	.084						
Adjusted R^2	.055						
Std. Error of the Estimate	.9722						
F	2.878						
Sig.	0.040						

Equation 5-10, there are 5.5 percent (adjusted R^2) of possibility variation in the emphasis based on organisational non-financial performance before IIS implementation is associated with a group of DSS. With F value of 2.878 at significant level of 0.040, the estimated equation model is shown as

Non-Financial performance = -0.346+0.086DSS+0.040Size-0.03Type........(5-10)

The regression coefficient of a group of DSS of 0.086 is significantly different from zero with the t value of 2.734. This implies that if the organisations adopt one more unit DSS, their organisational non-financial performance before IIS implementation is expected to increase for 0.086 units with the high degree of certain (99%, p<0.01).

➢ *Summary of the Research Finding Relating to MAP Adoption Influencing Organisational Performance*

To summarise, before IIS have been implemented in organisations, the number of MAP adoption including conventional PE, advanced APE, LTP and DSS have a positive association with both financial performance and non-financial performance of organisations. However, the findings indicate that the higher B adoption are, the higher financial performance of organisations before IIS implementation, whereas the higher PC adoption are, the higher non-financial performance of organisations. Consequently, the findings support Hypotheses H7 and H8. Summary of Hypotheses findings presents in table 5.29.

5.5.3 Organisational Performance, MAP Adoption and IIS Implementation

The objectives of this study are to investigate relationships between the number of MAP adoption and the implementation of IIS on organisational performance including financial performance and non-financial performance (Table 5.29, Hypotheses H9-H12), as well as to explore the interaction effect of the number of MAP adoption and IIS implementation on both organisational financial performance and organisational non-financial performance (Table 5.29, Hypotheses H13 and H14).

To test the hypotheses, six groups of MAPs namely B, PC, CPE, APE, LTP, and DSS are used as independent variables as well as IIS adoption and the interaction between the adoption of MAP and IIS. Financial performance and non-financial performance of organisations are used as dependent variables. Hierarchical regression analysis is used to investigate the existence of a statistically significant interaction in the empirical contingency research (Hyvönen, 2007; Maiga *et al.*, 2014). Equation 2 below is analysed in order to test the main effects of either the number of MAP adoption or IIS adoption on organisational performance whereas with equation 3 the main effects and the interactive effects of the adoption of MAP and IIS are to be analysed separately. As with the hierarchical approach, the multiple regression models were employed as follow.

$$OP_i = \alpha + \beta_1 MAP_i + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon \qquad ....(2)$$

$$OP_i = \alpha + \beta_1 MAP_i + \beta_2 IIS + \beta_3 (MAP_i \ x \ IIS) + \beta_4 Size + \beta_5 Type + \varepsilon \qquad ....(3)$$

Where

OP_i =   Operational performance after implemented IISs; i = financial performance, non-financial performance

α	=	intercept
$\beta_1 MAP_i$	=	Linear effect of MAP_i ; i = budgeting system (B), product
		costing (PC), conventional performance evaluation (CPE),
		advanced performance evaluation (APE), long-term planning
		(LTP, and decision support system (DSS)
$\beta_2 IIS$	=	Linear effect of IIS adoption
$\beta_3 (MAP_i \; x \; IIS)$	=	Interaction effect of MAP_i and IIS
$\beta_4 Size$	=	Linear effect of company size
$\beta_5 Type$	=	Linear effect of business type

The regression assumptions were tested for all regression equations by examining the residual plots, the outliers, and influential observations using standardised residual values, and Leverage test (Hair *et al.*, 2009). It was found that these assumptions are not extremely violated. Thus, all observations were entered into the analysis. Before presenting an interpretation of results, this study is aware of multicollinearity issue which is measured by two statistical measures: the tolerance value and the variance inflation factor (VIF). The higher degree of collinearity, the lower tolerance value will be found. Hair *et al.* (2009) suggests that to remain a small degree of multicollinearity, a tolerance value should be above 0.10 and low VIF value should be below 10. If the multicollinearity issue occurs during the analyses, it can be completely eliminated by manipulating the original points for the continuous variables (Gupta and Govindarajan, 1993). No multicollinearity issue was found on the hierarchical models meaning the number of MAP adoption is not likely to be strongly correlated with the IIS adoption term.

The main effects and the interaction effects are analysed based on six groups on MAPs: B, PC, CPE, APE, LTP, and DSS and two types of organisational performance: financial and non-financial. Consequently, there are 24 equations in total. Only 9 equations have been found statistically significant between a group of MAPs and/or IIS adoption and OP. However, an interaction effect of MAP and IIS adoption on OP has not been found. These indicate that there is no significant association between linkages of the number of MAP adoption and IIS adoption on either financial OP or non-financial OP. Only significant findings of the main effects of MAP and IIS adoption on both financial performance and non-financial performance of organisations will be analysed below.

The multiple regression results are presented in table 5.20 – 5.22. All regression models are assessed with the change of R^2 indicating the optimal models and the possible variation in the emphasis placed on dependent variables is associated with a set of independent variables as well as F ratio to test the goodness of fit of the models. There are three out of six equations which have been found statistically significant of the models. Those significances can be summarised as the number of MAP adoption namely B, CPE, and LTP have positive effects on financial performance of organisations indicating the more organisations adopt MAPs in groups of B, CPE or LTP, the more benefits obtained from financial performance of an organisation. Nevertheless, IIS adoption, organisational size and business type are not statistically significant on all the regression models. It could imply that the adoption of IIS, the number of employees which were used to measure organisational size, and industry type have no general effect on financial performance of organisations after implemented IIS. These variables are therefore excluded for explanatory purposes.

Table 5.20: Multiple Regressions: The Impact of Budgeting Systems Adoption and IISs Implementation on Organisational Performance (Financial) after Implemented IISs

Equation 5-11: $OP_{Fin} = \alpha + \beta_1 Budgeting\ Systems + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.607	.263		-2.307	.023		
B	.072	.043	.173	1.685	.095	.936	1.068
IIS implementation	.307	.203	.154	1.517	.133	.956	1.046
Size	.067	.067	.100	.999	.321	.976	1.025
Business type	.274	.232	.120	1.181	.241	.957	1.045
Coefficient of Determination R^2	.081						
Adjusted R^2	.042						
Std. Error of the Estimate	.9788						
F	2.060						
Sig.	0.092						

Equation 5-11, there is a 4.2 percent (adjusted R^2) of possibility variation in the emphasis based on organisational financial performance after IIS implementation is associated with a group of budgeting systems and IIS implementation. With F value of 2.060 at significant level of 0.092, the estimated equation model is shown as

Financial performance = -0.607+0.072B+0.307IIS+0.067Size+0.274Type........(5-11)

The regression coefficient of a group of budgeting systems of 0.072 is significantly different from zero with the t value of 1.685. The t-value implies that an organisation adopting one more unit of budgeting systems will improve organisational financial performance after IIS implementation by 0.072 units with a high degree of certainty, (90%, p<0.10).

Table 5.21: Multiple Regressions: The Impact of Conventional Performance Evaluation Adoption and IISs Implementation on Organisational Performance (Financial) after Implemented IISs

Equation 5-12: $OP_{Fin} = \alpha + \beta_1 Conventional\ Performance\ Evaluation + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.600	.251		-2.391	.019		
CPE	.110	.047	.236	2.359	.020	.959	1.042
IIS implementation	.305	.198	.153	1.538	.128	.969	1.032
Size	.058	.066	.088	.881	.381	.971	1.030
Business type	.267	.227	.117	1.178	.242	.974	1.027
Coefficient of Determination R^2	.107						
Adjusted R^2	.068						
Std. Error of the Estimate	.9652						
F	2.779						
Sig.	0.031						

Equation 5-12, there is a 6.8 percent (adjusted R^2) of possible variation in the emphasis based on organisational financial performance after IIS implementation is associated with a group of CPE and IIS implementation. With F value of 2.779 at significant level of 0.031, the estimated equation model is shown as

Financial performance = -0.600+0.110CPE+0.305IIS+0.058Size+0.267Type........(5-12)

The regression coefficient of a group of CPE of 0.110 is significantly different from zero with the t value of 2.359. The t-value implies that an organisation adopting one more unit of 'conventional performance evaluations', improves its organisational financial performance after IIS implementation by 0.110 units with the high degree of certainty, i.e. (95%, p<0.05).

Table 5.22: Multiple Regressions: The Impact of Long-term Planning Adoption and IISs Implementation on Organisational Performance (Financial) after Implemented IISs

Equation 5-13: $OP_{Fin} = \alpha + \beta_1 Long - term\ Planning + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.532	.246		-2.164	.033		
LTP	.112	.049	.233	2.286	.025	.927	1.079
IIS implementation	.300	.199	.150	1.504	.136	.965	1.037
Size	.038	.067	.057	.561	.576	.934	1.071
Business type	.221	.226	.097	.981	.329	.985	1.015
Coefficient of Determination R^2	.104						
Adjusted R^2	.065						
Std. Error of the Estimate	.9669						
F	2.690						
Sig.	0.036						

Equation 5-13, there is a 6.5 percent (adjusted R^2) of possibility variation in the emphasis based on organisational financial performance after IIS implementation is associated with a group of LTP and IIS implementation. With F value of 2.690 at significant level of 0.036, the estimated equation model is shown as

Financial performance = -0.532+0.112LTP+0.300IIS+0.038Size+0.221Type........(5-13)

The regression coefficient of a group of LTP of 0.112 is significantly different from zero with the t value of 2.286. It implies that if the organisations adopt one more unit of LTP, their organisational financial performance after IIS implementation is expected to increase by 0.112 units with a high degree of certainty, i.e. (95%, $p<0.05$).

➢ *Non-Financial Performance of Organisations after IIS Implementation*

The regression results are presented in table 5.23 – 5.28. All six equation results can be summarised as follows. Each model reveals a positive significant impact of IIS adoption on non-financial performance of organisations (Table 5.3, panel B2). Only two groups of MAPs: CPE and LTP show positive associations with non-financial performance of organisations after implemented IIS. Business type as a control variable which measures an industrial organisation also has a positive significant association with non-financial performance of organisations for all equations. These indicate that industrial organisations are predicted to obtain non-financial performance benefits more than non-industrial organisations. In contrast, four groups of MAPs: B, PC, APE, and DSS and a control variable: organisational size are not associated with non-financial performance in a statistically significant manner. A possible interpretation of this finding is that adoption of B, PC, APE, and DSS and the number of employees which measure organisational size have no impact on non-financial performance of organisations after IIS implementation. Therefore, only statistically significant results will be interpreted in the explanatory material that follows:

Table 5.23: Multiple Regressions: The Impact of Budgeting System Adoption and IISs Implementations on Organisational Performance (Non-financial) after Implemented IISs

Equation 5-14:

$$OP_{Non-Fin} = \alpha + \beta_1 Budgeting\ Systems + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.519	.259		-2.005	.048		
B	.032	.042	.077	.762	.448	.936	1.068
IIS implementation	.527	.199	.264	2.645	.010	.956	1.046
Size	.015	.066	.023	.235	.815	.976	1.025
Business type	.447	.228	.196	1.961	.053	.957	1.045
Coefficient of Determination R^2	.111						
Adjusted R^2	.073						
Std. Error of the Estimate	.9628						
F	2.909						
Sig.	0.026						

Equation 5-14, there is a 7.3 percent (adjusted R^2) of possible variation in the emphasis based on non-financial performance of organisations after IIS implementation is associated with a group of budgeting systems and IIS implementation. With F value of 2.909 at significant level of 0.026, the estimated equation model is shown as

Non-Financial performance = -0.519+0.032B+0.527IIS+0.015Size+0.447Type........(5-14)

The regression coefficient of IIS implementation of 0.527 and business type of 0.447 are significantly different from zero with the t value of 2.645 and 1.961, respectively. These results imply that if organisations adopt IIS, non-financial performance of organisations is predicted to increase by 0.527 units with a high degree of certainty, i.e. (99%, $p<0.01$).

Table 5.24: Multiple Regressions: The Impact of Product Costing Adoption and IISs Implementations on Organisational Performance (Non-financial) after Implemented IISs

Equation 5-15: $OP_{Non-Fin} = \alpha + \beta_1 Product\ Costing + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.497	.250		-1.992	.049		
PC	.044	.056	.078	.792	.430	.975	1.025
IIS implementation	.543	.197	.272	2.759	.007	.981	1.019
Size	.012	.066	.018	.176	.860	.967	1.034
Business type	.431	.225	.189	1.915	.059	.980	1.020
Coefficient of Determination R^2	.112						
Adjusted R^2	.073						
Std. Error of the Estimate	.9626						
F	2.922						
Sig.	0.025						

Equation 5-15, there is a 7.3 percent (adjusted R^2) possible variation in the emphasis based on non-financial performance of organisations after IIS implementation is associated with a group of PC and IIS implementation. With F value of 2.922 at significant level of 0.025, the estimated equation model is shown as

Non-Financial performance = -0.497+0.044PC+0.543IIS+0.012Size+0.431Type......(5-15)

The regression coefficient of IIS implementation of 0.543 and type of business 0.431 are significantly different from zero with the t value of 2.759 and 1.915, respectively. These results imply that if organisations adopt IIS, non-financial performance is predicted to increase for the organization by 0.543 units with a high degree of certainty, i.e. (99%, $p<0.01$).

Table 5.25: Multiple Regressions: The Impact of Conventional Performance Evaluation Adoption and IISs Implementations on Organisational Performance (Non-financial) after Implemented IISs

Equation 5-16: $OP_{Non-Fin} = \alpha + \beta_1 Conventional\ Performance\ Evaluations + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.565	.247		-2.291	.024		
CPE	.085	.046	.183	1.862	.066	.959	1.042
IIS implementation	.506	.195	.254	2.596	.011	.969	1.032
Size	.008	.065	.011	.118	.907	.971	1.030
Business type	.464	.223	.203	2.084	.040	.974	1.027
Coefficient of Determination R^2	.138						
Adjusted R^2	.101						
Std. Error of the Estimate	.9483						
F	3.715						
Sig.	0.008						

Equation 5-16, there is a 10.1 percent (adjusted R^2) possible variation in the emphasis based on non-financial performance of organisations after IIS implementation is associated with a group of CPE and IIS implementation. With F value of 3.715 at a significant level of 0.008, the estimated equation model is shown as:

Non-Financial performance = -0.565+0.085CPE+0.506IIS+0.008Size+0.464Type…(5-16)

The regression coefficient of a group of CPE adoption of 0.085, IIS implementation of 0.506 and business type of 0.464 are significantly different from zero with t -values of 1.862, 2.596 and 2.084, respectively. These t-values imply that if the organisations adopt a group of CPE after implementing IIS, non-financial performance of organisations is predicted to increase by 0.085 units with a high degree of probability, i.e. (90%, p<0.1). If an organization adopts IIS

it can be concluded, at a significance level of 95% (p<0.05), the non-financial performance of organisations will increase by 0.506 units.

Table 5.26: Multiple Regressions: The Impact of Advanced Performance Evaluation Adoption and IISs Implementations on Organisational Performance (Non-financial) after Implemented IISs

Equation 5-17: $OP_{Non-Fin} = \alpha + \beta_1 Advanced\ Performance\ Evaluations + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.481	.249		-1.936	.056		
APE	.024	.041	.058	.583	.562	.967	1.034
IIS implementation	.541	.198	.272	2.740	.007	.975	1.025
Size	.014	.066	.021	.216	.830	.972	1.029
Business type	.433	.227	.190	1.911	.059	.973	1.028
Coefficient of Determination R^2	.109						
Adjusted R^2	.071						
Std. Error of the Estimate	.9641						
F	2.841						
Sig.	0.028						

Equation 5-17, there is a 7.1 percent (adjusted R^2) of possible variation in the emphasis based on non-financial performance of organisations after IIS implementation is associated with a group of APE and IIS implementation. With F value of 2.841 at significant level of 0.028, the estimated equation model (5-17) is shown as

Non-Financial performance = -0.481+0.024APE+0.541IIS+0.014Size+0.433Type…(5-17)

The regression coefficient of IIS implementation of 0.541 and business type of 0.433 are significantly different from zero with t-values of 2.740 and 1.911, respectively. These t-values imply that organisations adopting IIS will experience an increase in non-financial performance by 0.541 units with a high degree of certainty, i.e. (99%, p<0.01).

Table 5.27: Multiple Regressions: The Impact of Long-term Planning Adoption and IISs Implementations on Organisational Performance (Non-financial) after Implemented IISs

Equation 5-18: $OP_{Non-Fin} = \alpha + \beta_1 Long - term\ Planning + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.513	.241		-2.128	.036		
LTP	.088	.048	.184	1.844	.068	.927	1.079
IIS implementation	.501	.196	.251	2.562	.012	.965	1.037
Size	-.009	.066	-.013	-.130	.897	.934	1.071
Business type	.429	.221	.188	1.937	.056	.985	1.015
Coefficient of Determination R^2	.137						
Adjusted R^2	.100						
Std. Error of the Estimate	.9486						
F	3.697						
Sig.	0.008						

Equation 5-18, there is a 10.0 percent (adjusted R^2) of possible variation in the emphasis based on non-financial performance of organisations after IIS implementation is associated with a group of LTP and IIS implementation. With an F-value of 3.697 at a significant level of 0.008, the estimated equation model 6-18 is shown as

Non-Financial performance = -0.513+0.088LTP+0.501IIS-0.009Size+0.429Type....(5-18)

The regression coefficients of a group of LTP adoption of 0.088, IIS implementation of 0.501 and business type of 0.429 are significantly different from zero with the t-values of 1.844,

2.562 and 1.937, respectively. These data imply that after implemented IIS the organisations adopting a group of LTP the non-financial performance of organisations will increase by 0.088 units with a high probability, i.e. (90%, p<0.1). At a significance level of 95% (p<0.05), IIS implementation can be concluded that if organisations adopt IIS, non-financial performance of organisations is predicted to increase by 0.501 units.

Table 5.28: Multiple Regressions: The Impact of Decision Support System Adoption and IISs Implementations on Organisational Performance (Non-financial) after Implemented IISs

Equation 5-19:

$$OP_{Non-Fin} = \alpha + \beta_1 Decision\ Support\ Systems + \beta_2 IIS + \beta_3 Size + \beta_4 Type + \varepsilon$$

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.511	.248		-2.063	.042		
DSS	.034	.031	.110	1.110	.270	.967	1.034
IIS implementation	.543	.196	.272	2.771	.007	.983	1.017
Size	.007	.066	.010	.102	.919	.958	1.044
Business type	.438	.225	.192	1.950	.054	.979	1.021
Coefficient of Determination R^2	.117						
Adjusted R^2	.079						
Std. Error of the Estimate	.9595						
F	3.091						
Sig.	0.019						

Equation 5-19, there is a 7.9 percent (adjusted R^2) possible variation in the emphasis based on non-financial performance of organisations after IIS implementation is associated with a group of DSS and IIS implementation. With an F-value of 3.091 at significant level of 0.019, the estimated equation model 5-19 is shown as

Non-Financial performance = -0.511+0.034DSS+0.543IIS+0.007Size+0.438Type...(5-19)

The regression coefficients of IIS implementation of 0.543 and business type of 0.438 are significantly different from zero with t-values of 2.771 and 1.950, respectively. These results imply that if organisations adopt IIS, the non-financial performance of the organisations will increase by 0.543 units with a high probability, i.e. (99%, $p<0.01$).

➤ *Summary of the Research Finding Relating to MAP Adoption and IIS Implementation Influencing Organisational Performance*

In summary, after IISs have been implemented in organisations, the number of MAP adoption (namely B, CPE and LTP) is positively associated with organisational financial performance whereas no association between the financial performance and IIS seems was observed. On the one hand, there are positive significant impacts from the number of MAP adoption (namely CPE and LTP) on organisational non-financial performance, this is combined with positive association between IIS implementation and organization's non-financial performance. As expected a positive sign is found for the interaction associations between the number of MAP adoption and IIS implementation impacts on OP: both financial performance and non-financial performance; however, no statistically significant results have been found. This findings are inconsistent with a study of Maiga *et al.* (2014) who indicated that IIS implementation and MAP adoption provided positive interaction to organisational financial performance in U.S. companies. IIS should be implemented as an interaction with MAPs, activity-based costing in particular to guide managers involved in resource allocation decisions results in enhancing organisational financial performance (Ibid.). As organisational non-financial performance, it seems that there are a few existing literature studies that investigated this area whose findings are inconsistent with this study's results. Hyvönen (2007) indicated that the combination between PE and IISs will impact on organisational non-financial performance. However, when ineffective advanced PE is aligned with expensive IISs the consequences may be lower organisational non-financial performance.

Consequently, the findings provide strong evidence to support hypotheses H9, H10, and H12 but the findings provide no evidence to support hypotheses H11, H13 and H14. Table 5-29 presents summary of hypotheses testing.

Table 5.29: Summary of Hypotheses Findings

Hypotheses	Results
H1: When facing high PEU the probability of firms adopting MAPs is higher than that of firms facing low PEU.	Accepted
H2: Firms under high MCI are more likely than others to adopt MAPs	inconclusive evidence
H3: Firms adopting a differentiation strategy will more probably adopt MAPs than firms not adopting this strategy.	Accepted
H4: Organic firms have a greater probability of MAP adoption more than mechanistic firms.	Rejected
H5: The more power distance in organisation leads to a lower probability of MAP adoption	Accepted
H6: Firms implementing IIS are more likely to adopt MAPs	Accepted
H7: There is a positive association between the number of MAP adoption and a firm's financial performance before IIS implementation.	Accepted
H8: There is a positive association between the number of MAP adoption and a firm's non-financial performance before IIS implementation.	Accepted
H9: There is a positive association between the number of MAP adoption and firm's financial performance after IIS implementation.	Accepted
H10: There is a positive association between the number of the number of MAP adoption and a firm's non-financial performance after IIS implementation.	Accepted
H11: There is a positive association between the adoption of IIS and a firm's financial performance	Rejected
H12: There is a positive association between the adoption of IIS and a firm's non-financial performance.	Accepted
H13: The two-way interaction between the number of MAP adoption and IIS implementation is positively related to a firm's financial performance.	Rejected
H14: The two-way interaction between the number of MAP adoption and IIS implementation is positively related to a firm's non-financial performance.	Rejected

5.6 Conclusion

This chapter describes how the variables were measured and justified groups of MAP adoption that have been used to test the hypotheses (Table 5.29). Given that the findings relating to factors influencing the individual MAP adoption were analysed in section 5.4, It can be implied that contingent factors namely the probability of MAP adoption are positively influenced by PEU, organisational (differentiation) strategy and IIS implementations. Whist, organisational culture (power distance) and organisational (decentralised) structure have a negative impact on the probability of MAP adoption, MCI has an inconclusive association with the MAP adoption. In addition, the impact of groups of MAP adoption and IIS implementation on OP: financial performance and non-financial performance is provided in section 5.5. It can be noted that groups of advanced MAPs namely DSS, PE and PC were found to have no significant impact on OP after implemented IIS. This may be because those groups of MAPs have not been widely adopted in Thai companies. Moreover, IIS implementation has positive impacts on non-financial performance. However, there is no evidence to support the relationship between an interaction of MAP adoption and IIS implementation and OP. This chapter presents the data finding and some discussion related to the significant results. Further discussion of this result will be presented in chapter seven. Next chapter presents interview findings.

Chapter 6. Interviews

6.1 Introduction

This chapter aims to identify why organisations adopt/reject advanced MAPs covering three aspects. Based on Abrahamson's (1991) framework, the interview findings were analysed into four perspectives: efficient-choice, forced, fad and fashion using four case companies operating in different industrial sectors[41]. Additionally, an organisational culture perspective was studied because the organisational culture is embedded in the design of an advanced MAPs (Bhimani, 2003) and affects the nature of use (Henri, 2006). Lastly, IISs which support data collection, analysis and reporting facilitate the use of MAPs (Rom and Rohde, 2006; Rom and Rohde, 2007). Therefore, organisational culture and IISs may influence MAP diffusion.

This chapter will start with selected cased studies. Next, a brief description of each case study which is comprised of the brief background[42] of the case company, some explanation of organisational financial ratios, and the adoption of MAPs follows. The next section provides qualitative data analysis which was analysed using the NVIVO programme. Some important statements made by the interviewees are quoted[43] where appropriate. Moreover, organisational culture which identified by the perception of work contexts and the perceived success of management accounting systems within the four case studies are presented. The organisational culture measurements were given in studies by Reynolds (1986), Quinn *et al.* (1991), Liu (2002), Bhimani (2003) and Henri (2006). Finally, supplementary information which unveils more insights of synergy between MAPs and IISs is outlined.

6.2 Case Studies

The case study approach[44] offers precise clarification for revealing an understanding of particular events that may explore beyond the limited ability of surveys (Rong-Ruey *et al.*, 2009; Yin, 2014, p. 27). Case study approach is used as an explanation of the way MAP diffusions occur using interviews and documentation (i.e. annual reports of case companies).

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[41] Case companies operates in consumer product-home and office products, technology, resources and consumer products-fashion.

[42] Some information from annual reports, company's websites and financial data provided by the SET were prepared before the interviews.

[43] Other than the CFO for company A who was comfortable with the interview being conducted in English all interviews were conducted in Thai, the native language of the researcher and the interviewees. The interviews were then translated into English by the researcher; two Thai individuals with advanced degrees from universities in the USA performed verification of the translations.

[44] Case study evidence can come from many sources: documentation, archival records, interviews, direct observation, participant-observation, and physical artifacts (Yin, 2014, p.99).

Case companies have been chosen covering different types[45] of business as classified by the SET. Four companies in different industrial sectors were chosen based on their expressed willingness to participate in interviews as specified in the questionnaires responses. The organisational types are consumer products-home and office products (company A), technology (company B), resource (company C) and consumer products-fashion (company D).

6.2.1 Company A: Consumer Product-home and Office Products

➢ *Corporate Background*

The company was listed on the SET in 1993. In July 1997 when economic crisis in the Asia Pacific region started, the company was severely affected resulting in an order of debt restructuring issued by SET. The company spent two years, from 2000-2002, converting a portion of its debts to equity according to the reorganisation plan. On July 2002, the Southern Bangkok Civil Court passed an order to release the company from the reorganisation plan by virtue of Section 90/70 of the Bankruptcy Act B.E. 2483. The company was released from the rehabilitation plan. As a result, the company's management team then resumed managerial control and has been implemented Oracle software ever since.

The core of the company business is in manufacturing and distributing plastic industrial products and melamine household or office products. The company also has a trading business by sourcing moulding for beverage packaging and/or other packaging to customers in both domestic and foreign countries. There are 8 subsidiaries, 6 associate companies and one joint venture company with operating locations in Thailand, Vietnam, India and Indonesia.

Its financial data[46] including sales, net profits, total assets, return on assets (ROA) and return on equity (ROE) from 1997-2012 are shown in table 6.1. The magnitude of the financial data is consistent over time.

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[45] The SET classifies business type into seven categories: technology, consumer products, resources, industrials, property and construction, services, and agro and food industry.
[46] Sources of financial data are annual report of the company and website of the SET.

Table 6.1: Sales, Net Profits, Total Assets, Return on Assets and Return on Equity of Company A

Year	Sales (£)*	Net Profit (£)*	Total Assets (£)*	ROA (%)	ROE (%)
1997	68.74	(72.27)	192.86	(43.38)	(211.61)
1998	61.14	21.79	176.39	11.80	67.15
1999	63.43	(20.49)	164.06	(12.04)	(84.77)
2000	70.69	(12.37)	154.22	(7.77)	(35.18)
2001	75.51	2.49	149.88	1.64	3.87
2002	75.75	10.51	134.69	7.38	14.47
2003	79.57	3.18	125.45	2.45	3.92
2004	90.01	6.29	125.76	5.01	7.38
2005	93.82	5.28	122.39	4.25	5.99
2006	106.28	7.93	134.05	6.18	8.65
2007	111.27	3.49	137.58	2.57	3.65
2008	115.55	1.96	149.04	1.37	2.04
2009	109.00	1.16	154.41	0.76	1.21
2010	137.20	5.36	156.97	3.44	5.86
2011	151.04	5.64	161.71	3.54	6.83
2012	175.15	10.84	186.51	6.22	13.37

Note: 1 GBP = 50 THB, *in millions of GBP
(Source: the Stock Exchange of Thailand)

Figure 6.1 presents one measure of organisational financial performance, ROA, of company A compared to the organisational performance within the same industrial sector – consumer product – home and office products. It seems the company's plan, converting a portion of company debt to equity, had a positive impact on organisational financial performance. It seems that consumer product sector and company A was affected by the environmental uncertainty caused by either Asian financial crisis in 1990s or European debt crisis in late 2009. However, the organisational financial performance has had a positive sign since 2001.

Figure 6.1: ROA of Company A compared to the Home and Office Sector
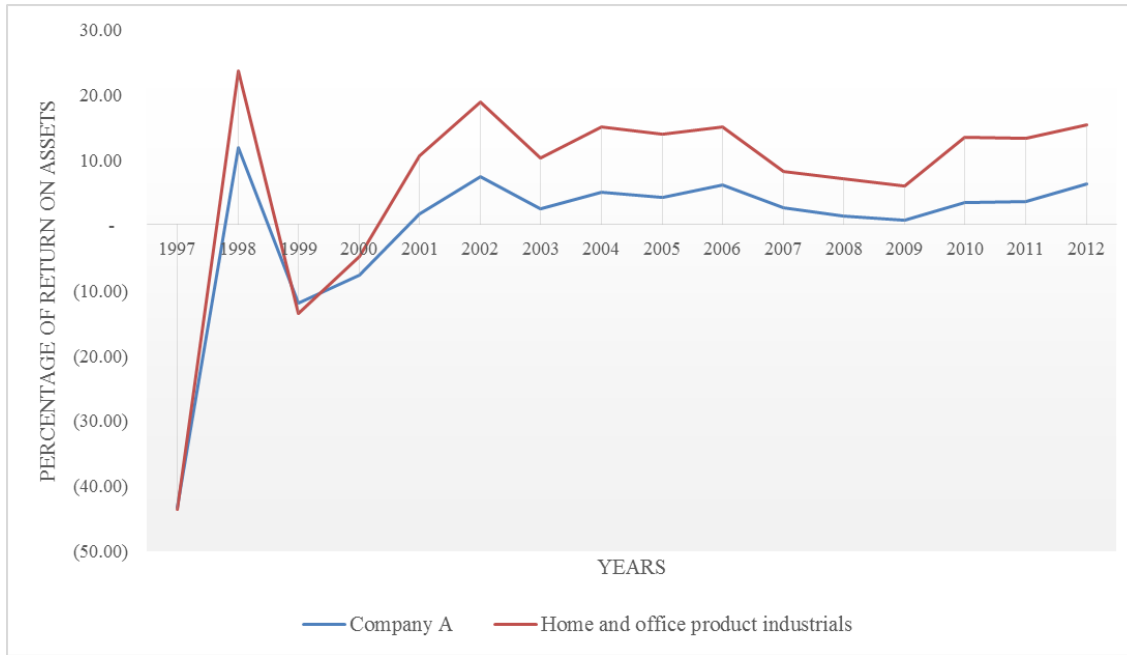
(Source: the Stock Exchange of Thailand)

➢ *Business Environment Uncertainty and Market Competition Intensity*

There are two major risk factors faced by the company: business risks and risks associated with production. Over-reliance on a few major customers, raw material price, and competition by direct-sale business are components of business risk. The company's food and beverage packaging products have experienced high market demand. The company provides both knowledge and production assistance for customers to maintain customer relations. Regarding the food and beverage industry, the company also keeps a close watch on trend and direction of production technologies, particularly new patents or technologies that might replace the current ones to help reduce costs and promote Corporate Social Responsibility (CSR) activities for customers. The company is also aware of the risk of raw material price changes which are highly dependent on oil prices. A major raw material is plastic resin which is produced by the oil refining process. The company's objective is to bear the risk of rising cost and not to adjust selling prices to compensate for the increase in cost at times of raw material price fluctuation. Managers implemented supply chain management (SCM) to jointly determine the appropriate size of orders with the customers and to coordinate with the raw material producers to improve efficiency and effectiveness of delivery of raw materials. The company's production schedule is one measure taken to safeguard against price-fluctuation risk. Direct sale business in Thailand has been very successful with continued growth

projected. The company has plans to adopt a brand awareness strategy such as a customer loyalty program; a focus on creating new innovative working systems; creating products for business differentiation; to be the leader of innovation in the network marketing business; and enable a JIT delivery system to handle the risk created by competitors in the direct sale business.

In terms of production risk, raw material is available from only a few suppliers in Thailand while the company's demand has increased along with business growth. Therefore, the company has taken two partners to engage in a joint research and development (R&D) scheme for raw materials. It also has a good relationship with other producers as long-time trading partners. Labour risks are another of the production risks associated with operations. The company has recognised these effects and prepared measures to reduce their impact on the business such as developing Lean Manufacturing Techniques in the work process inside the plant; establishing a training centre to provide production training for workers; providing welfare to satisfy basic needs in addition to wages as required by law; and developing quality of life by promoting and nurturing feelings of affinity as a part of the organisation.

➢ *Organisational Strategies*

The organisation produces both plastic industrial- and household products and products for the food and beverage industry. There are two main organisational strategies. First, the plastics business line focuses on innovations and technology to get more efficient products so as to enhance competitiveness and sustainable growth of business. For the food and beverage industry the organisation gains "first-mover" advantage over its competitors by being the first manufacturer entering the beverage packaging products market in Thailand. With enhanced production technology, the beverage packaging products help customers reduce cost, using fewer raw materials which are also environmentally friendly.

It seems that organisational use of innovative product design is one of the firm's organisational strategies. However, this may imply that the organisation adopts a product differentiation strategy to enhance its competitive advantages in those two lines of business.

➢ *Organisational Structure and Culture*

Generally, organisational management is under the responsibility of the board of directors which consists of at least 5-12 directors according to the Articles of Association. All 20 executive directors on the Board have Thai nationality. More than half have a degree from universities abroad (Table 6.5). In addition, from the company's annual report, the chart of

organisation shows there are at least 7 hierarchal management layers: the Board of Directors, Executive committee, president, chief department officer, senior director, director, front-line manager.

The company puts an emphasis on personnel value added by enhancing working skills and quality of staff. The personnel have a consciousness of morality and virtue so as to work together promoting team-work and likewise are encouraged to appreciate the company as a part of their lives. The personnel are also encouraged to continually develop and improve the capability of themselves and their work to be more efficient. In addition, the personnel unit supports requirements of concerned persons from both inside and outside the organisation with up-to-date, correct and quick information; the personnel unit works systematically and makes decisions based on correct analysed information.

➤ *Management Accounting Practices*

The company has been using a hybrid of conventional and advanced MAPs to manage its operations (Table 6.6). For the purposes of decision making, planning and control in both short-term and long-term, they adopt budgeting systems, capital budgeting system: NPV, IRR, and payback period, CVP, formal strategic planning, and long-range forecasting. For costing purpose, the company uses standard costing which is an adapted version of kaizen costing. The company also adopts a range of analytical MAPs to manage product and customer performance, including both financial and non-financial organisational performance evaluation MAPs. TQM has also been adopted to continuously improve the ability to deliver high-quality products and increase customer satisfaction.

To sum up, company A is in consumer product – home and office products. The financial data of the organisation during 1997-2012 indicates that sales, net profit, ROA and ROE have been increasing since 1999. The organisation adopted innovative product and design, as one of its organisational strategies to enhance competitive advantages. The company has adopted a hybrid of MAPs, which include conventional ones (including budgeting systems and standard costing) and advanced ones (including benchmarking, JIT and performance evaluations-BSC and –customer satisfaction survey). For integrated information systems of the organisation, Oracle has been implemented as a basic database and for reporting purposes, but not for MA information.

➢ *Corporate Background*

The organisation was established as a private limited organisation in 1989 to provide wireless communications services under a concession grated by the communications authority of Thailand. The organisation was listed on the SET in 2007.

The organisation is engaged in the provision of wireless services and the sale of technology devices. As a group, the company has adopted IISs: Oracle and Hyperion to be a standard with other corporate companies.

The company's financial data for the period of 2008-2012 is shown in table 6.2. The financial data show a decline in 2009, but then continues to increase afterward. Only total assets hit a bottom in 2010 then sharply increased in 2011. It seems that the European economic crisis of 2010 did not affect the company's sales.

Table 6.2: Sales, Net Profits, Total Assets, Return on Assets and Return on Equity of Company B

Year	Sales (£)*	Net Profit (£)*	Total Assets (£)*	ROA (%)	ROE (%)
2008	1,346.54	186.58	2,088.70	14.03	16.76
2009	1,313.71	132.56	2,001.60	10.04	10.87
2010	1,447.03	217.83	1,986.26	15.61	16.58
2011	1,585.96	236.26	2,076.94	17.24	22.78
2012	1,789.95	225.56	2,020.37	15.54	32.32

Note: 1 GBP = 50 THB, *in millions of GBP
(Source: the Stock Exchange of Thailand)

A comparison between percentage of ROA of company B and the whole technology group is shown in figure 6.2. Overall, the pattern of organisational financial performance in company B was similar to its sector except in 2009 and 2010.

Figure 6.2: ROA of Company B compared to the Technology Sector
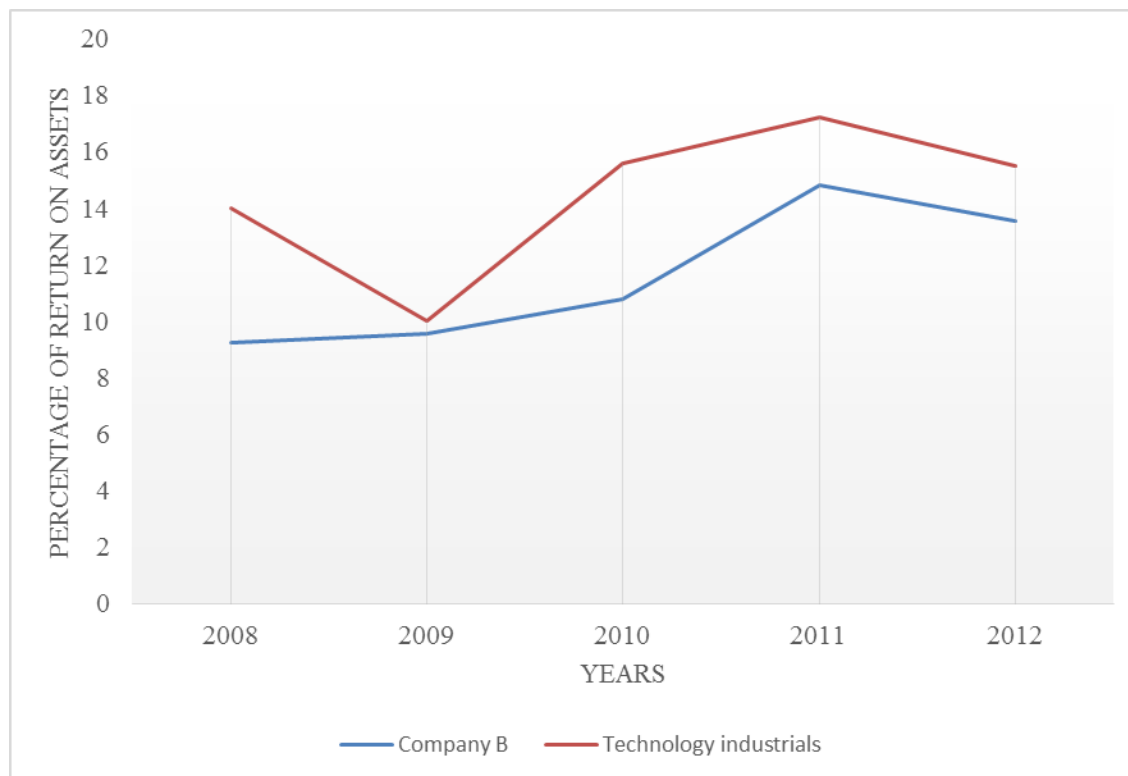
(Source: the Stock Exchange of Thailand)

> ➤ *Business Environment Uncertainty and Market Competition Intensity*

Like all companies the company is exposed to risks and mitigations. Risks such as termination of the concession agreement before its term, changing laws and regulations, and competition may affect the operation of the company and its subsidiaries' businesses. The company has uncertainty about regulation and enforcement of related laws and regulations such as fixing service fees and tariff structure and issuing rules and measures for consumer protection might reduce the company's ability to make profits and might increase the cost of operation for the group of companies and also the company itself. These uncertainties may adversely affect the financial condition and results of operations of the company. Currently, there are no guidelines relating to the accounting method for recording revenues and expenses accrued in such a business type, and there is no final court judgement on the issue relating to a part of business operation.

In terms of competition, technology industrial sector is highly competitive and sensitive to price competition because the market has expanded considerably. Under conditions of high competition in terms of price, promotions, marketing campaigns, and advanced technology

services, the company has to respond in a timely and cost-efficient manner. The company has developed various types of services and made adjustments to its marketing strategies to assure that the company will not suffer substantially if such economic conditions continue to persist.

➢ Organisational Strategies

The company focuses on customer relationships. The company will strive to innovate on their core services to differentiate and improve the customer experience, retain existing subscribers and deliver services customers truly value, and utilise its resources to better meet future customer needs.

➢ Organisational Structure and Culture

There are multiple citizenships amongst the 12 directors on the organisational board. It seems that a CEO can hold citizenship different from the executive management who is Thai. Almost all directors graduated from an institution abroad or have experience outside Thailand (table 6.5). The organisation chart shows at least 4 management layers: executive management, CEO, Chief Group Officer and head of department group.

A corporate culture was created based on vision, mission, strategy, and values. It includes duties and leadership expectations, corporate governance, policies and practices. The company puts the customer first when creating new products and services to achieve the best customer experience. The company executives also express a belief their employees are the most important resource. Thus, employees are trained to fully develop their capabilities, also empowered to make decisions and take responsibilities to create a sense of shared ownership of the company.

➢ Management Accounting Practices

According to the requirements for a joint venture company, diversified MAPs have been adopted. KPI systems, for example, are set up and linked to strategic planning and budgeting systems. An average method is used for allocating costs to each product instead of an accurate method like ABC. In sale unit, non-financial performance evaluations such as customer satisfaction, team performance and the number of customer complaints are used to review organisational performance to ensure all employees are working toward the same goals. To evaluate investment in new projects, capital budgeting: IRR and payback period analysis has been adopted.

To sum up, organisation B operates in the technology industry. The Board of Directors of the organisation are of mixed nationalities. Organisational financial data have continually increased since 2009. The risk to the organisation is laws and regulations which relate to the industrial type. Pricing competition and customer demands result in a high level of market competition. Differentiation, innovation and focus on customer needs are the main targets of the organisation. Therefore, Oracle as integrated information systems and management accounting practices, mainly non-financial performance evaluation such as customer satisfaction and team performance, are implemented to gain competitive advantages.

6.2.3 Company C: Resources

➢ **Corporate Background**

The company was listed on the SET in 1993. A vertically integrated organisation the company operates an oil refinery and marketing the finished products through its service stations under its company's brand. The sale of oil is also made through major and the minor oil traders. The company's other businesses are production and distribution of electricity produced by solar cells.

To enable more efficient processing of company data, both analytical and operational, the company has been using the SAP accounting system. The Information Technology of the company has been, therefore, modernised for internal acceptance.

Table 6.3 illustrates the organisational financial data from 1997-2012. Sales tend to decline in 1998, 2001 and 2009 but increased in all other periods. Total assets have been increasing since 2008. ROA and ROA, in turn, seem to increase in 2009 periods then suddenly dropped in 2010. It seems that although the company could increase sales but the economic crisis of 2010 may have adversely affected organisational performance of the company.

Table 6.3: Sales, Net Profits, Total Assets, Return on Assets and Return on Equity of Company C

Year	Sales (£)*	Net Profit (£)*	Total Assets (£)*	ROA (%)	ROE (%)
1997	767.68	(75.69)	622.59	7.85	(36.15)
1998	682.76	1.19	548.35	3.81	0.58
1999	772.43	(34.68)	580.31	3.08	(19.39)
2000	1,042.36	(31.30)	579.95	(1.08)	(22.87)
2001	969.66	(59.74)	527.86	(5.94)	(72.20)
2002	1,036.08	10.67	578.02	6.60	15.21
2003	1,231.89	(25.98)	571.82	(0.20)	(33.99)
2004	1,596.95	52.73	687.40	10.87	41.08
2005	1,717.40	58.53	685.27	11.22	25.84
2006	1,885.40	3.91	751.71	2.32	1.24
2007	1,899.59	35.28	899.74	8.05	8.85
2008	2,580.83	(15.00)	850.80	(0.58)	(3.66)
2009	2,173.63	150.49	1,077.82	23.36	33.01
2010	2,727.39	56.26	1,249.07	8.23	10.66
2011	3,172.20	112.20	1,232.07	11.33	19.82
2012	3,304.92	85.45	1,417.07	8.99	13.81

Note: 1 GBP = 50 THB, *in millions of GBP
(Source: the Stock Exchange of Thailand)

A comparison of ROA between company C and it sector is illustrated in figure 6.3. The financial performance of company C was similar to its resource sector. However, during 1997-2012, the financial performance of company C was higher overall financial performance in the same sector only in 1998 and 2009.

Figure 6.3: ROA of Company C compared to the Resource Sector
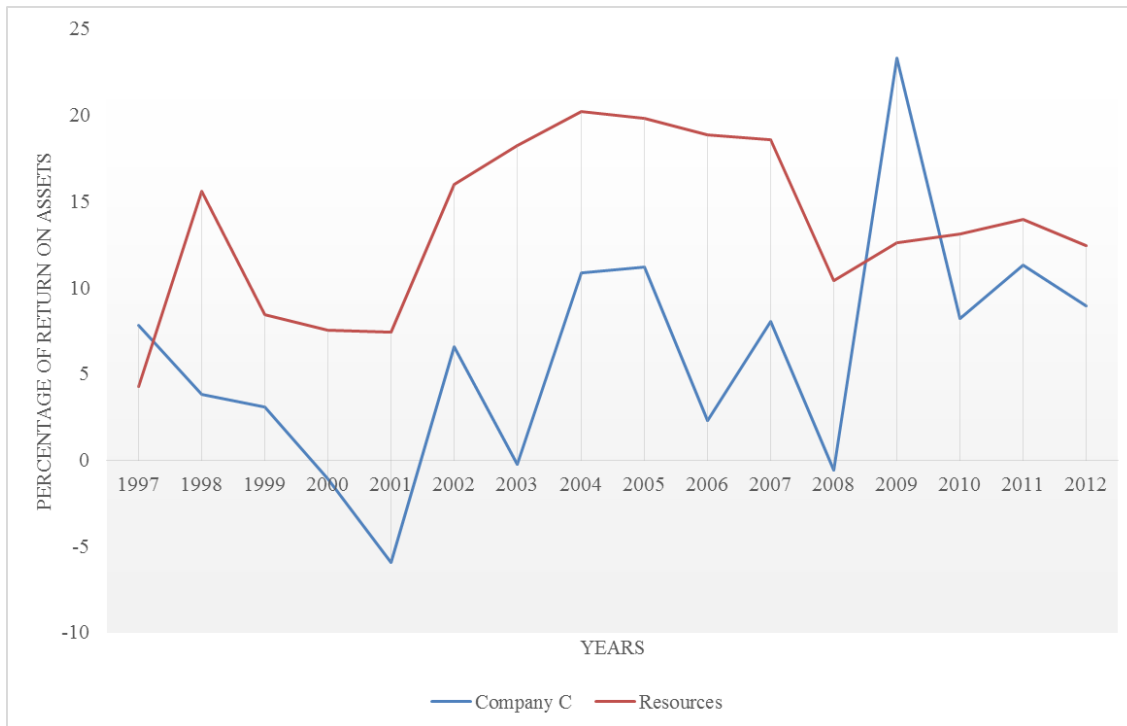
(Source: the Stock Exchange of Thailand)

➤ *Business Environment Uncertainty and Market Competition Intensity*

The company has prepared for changing economic circumstances by implementing a risk management system under the internationally accepted COSO enterprise Risk Management (COSO ERM). It is also aware of operating- and strategic risks, and regulations affecting on the environmental risks. Environmental uncertainty: the volatility of oil prices, uncertainty of output volumes, and investment choices for new business is part of the risks confronting the organisation. The company organises executive seminars to define business strategies compatible with changing circumstances. The risk management plan is one of the measures that has been conducted and senior executives have responsibility for monitoring the company's performance, weekly and monthly, to ensure goal achievement. The Key Performance Indicators (KPI) system has defined and mapped out a risk management plan so as to boost confidence in achieving the company's goal. The company regularly and continually monitors, reviews and conducts drills of its crisis management plans. The company also continually assesses the risks and impacts caused by external circumstances and improves operations by applying lessons learned.

> *Organisational Strategies*

Differentiation strategy seems to be adopted as part of the organisational strategy by clarifying and presenting the firm as a social and environmental friendly organisation as well as the zero carbon neutral.

> *Organisational Structure and Culture*

The Board of Directors of the company is dominated by 14 Thais. There are 11 directors who have a certificate or a degree from an institution outside Thailand (table 6.5). There are three main layers on the organisation chart: The Board of Directors, president, head of business-line and at least four committees.

Developing sustainable business, while safeguarding the environment and promoting society are the main aspects of the company's business culture. Employees are expected to be virtuous, knowledgeable, and contribute to society as an element of the employee culture. Employees have a strong commitment to their continuous development based on a clear business policy of job rotation which shows career path development. The company provides various learning channels such as Knowledge Management (KM), cross-functional and cross-divisional group activities so employees are able to share valuable information resources of skills, technologies, financial knowledge, and lessons learned.

> *Management Accounting Practices*

The company has adopted a budgeting system, capital budgeting system: NPV, IRR, and payback period to control cost and expense and also to make decisions about new branch investments. Moreover, the organisation has adopted ABB, performance evaluation, measures of customer satisfaction, and a KPI system which is adjusted for each department in planning and performance evaluation based on the BSC framework.

To sum up, organisation C operates in the energy and utilities sector and marketing the finished products of its oil refinery. The organisational financial data show a high point of ROA and ROE in 2009 whereas sales dropped. This might be because of some unexpected situation in 2008. Being a social and environmentally friendly organisation are part of the organisational targets. Employees are expected to be virtuous, knowledgeable, and contribute to society as an element of employee culture. Organisation implemented SAP and advanced management accounting practices such as ABB and customer satisfaction in order to be modernised for internal acceptance.

6.2.4 Company D: Consumer Products-fashion

➢ **Corporate Background**

The company was listed on the SET in 1994. The nature of the business is a consumer products distributor to distribute fashion brands, mid-level and high-end fashion products, from both imports and from affiliate productions. Fashion and beauty products are the most pronounced of the product line. The company imports products to conduct a wholesale business through shops and department stores both in domestic and international markets.

The company has adopted IIS namely Oracle along with several in-house software packages which have been installed to manage goods and inventory effectively. Data obtained is used to analyse market demand, monitor and predict inventory volume to effectively adjust product plans, manage sales, and perform promotional activities. Customer brand loyalty seems to be diminishing. The company established a research team to assure freshness of products and arrange marketing campaigns when sales are lower than targeted. Modern technology systems are playing an important role in predicting consumer spending.

Sales, Net Profits, Total Assets, ROA and Return on Equity of the company are shown in table 6.4. All financial data tend to increase during 1999-2012 but the tendency has been for all financial data to slightly decrease during 1997-1998.

Table 6.4: Sales, Net Profits, Total Assets, Return on Assets and Return on Equity of Company D

Year	Sales (£)*	Net Profit (£)*	Total Assets (£)*	ROA (%)	ROE (%)
1997	153.84	2.39	181.22	2.87	1.89
1998	136.88	3.93	158.32	4.71	3.07
1999	143.63	4.23	173.50	4.36	3.2
2000	160.68	9.41	183.32	8.19	6.76
2001	170.92	12.64	196.83	9.22	8.44
2002	174.38	12.49	187.67	8.92	8.11
2003	176.90	8.19	205.04	6.12	5.09
2004	198.17	13.51	222.17	7.86	7.71
2005	231.10	13.73	245.94	8.38	7.3
2006	257.77	14.67	262.91	8.18	7.22
2007	224.64	14.61	256.35	7.35	6.81
2008	218.94	15.57	265.53	7.99	7.07
2009	212.97	13.05	278.35	6.66	5.69
2010	225.89	16.20	304.89	7.43	6.54
2011	256.51	14.89	334.03	7.06	5.57
2012	273.55	19.44	386.49	7.03	6.51

Note: 1 GBP = 50 THB, *in millions of GBP
(Source: the Stock Exchange of Thailand)

A comparison of ROA between company D and consumer product in fashion group is shown in figure 6.4. Although company D had lower ROA than their industry peers in 1998, company D has outperformed the industry sector for time periods, in particular during 1999-2003 and in 2008.

Figure 6.4: ROA of Company D compared to the Consumer Product in Fashion Sector
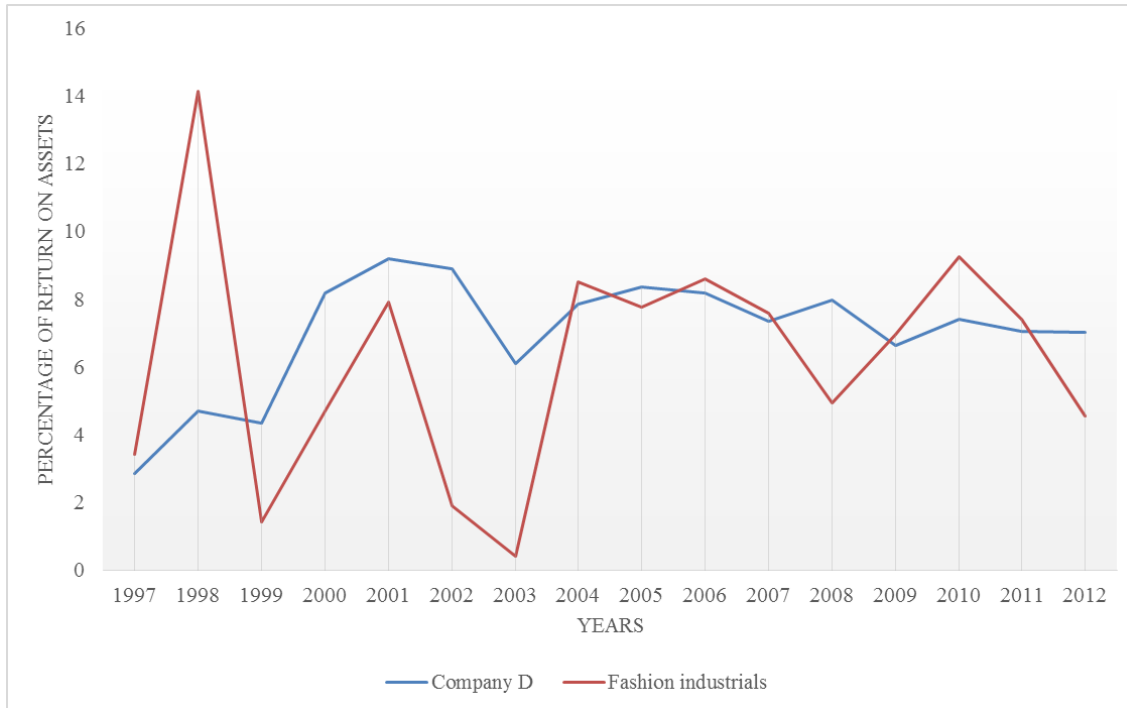
(Source: the Stock Exchange of Thailand)

➢ *Business Environment Uncertainty and Market Competition Intensity*

Selling fashion products, the company faces risky situations such as manufacturing risks, in-store inventory management risks and changes in customer tastes so the company has prepared several preventive measures. The company has a few major suppliers in each product category risking an out-of-stock condition when suppliers cannot supply the company with products of the required quantity in a timely manner. Thus, the company has made an interface agreement with suppliers to guarantee the volume and timing of product delivery. Political uncertainty also makes consumers more cautious about spending which results in increased market competition. The company attempts to prevent the impact of intense marketing competition by adopting major measures: investing on research and development for new innovative products; using the advantage of a cost-effective production line and establishing long and lasting relationships with trading partners; and implementing on-line computer systems at every sales counter throughout the country based on a real-time basis.

➢ *Organisational Strategies*

Business goals have been set by The Board of Directors to ensure that both executives and staff at all levels have the same goals. The company aims to establish new brand products; to meet customer needs by developing both improved quality and design of its current products, and to improve competitiveness. To boost marketing potential the company provides domestic and imported products with reduced production and acquisition costs including internationally outstanding low-price products.

➢ *Organisational Structure and Culture*

The Board of Directors of the company is dominated by 11 Thai citizens. More than half the directors have a certificate or a degree from an institution outside Thailand (Table 6.5). The company seems to have several hierarchical layers. Regarding structure of organisation, there are at least 6 hierarchical layers: company's board, vice chairman, president and executive chairman, director and executive vice president, cooperate system development, head of division, and front-line manager and several committees.

The organisation conducts business with corporate social responsibility in mind, encompassing fair and humane employment rights, environmentally friendly business operations and a strong anti-corruption work culture. To achieve sustainable progress the organisation has implemented policies which rely on affecting all stakeholders fairly including society and the nation as a whole.

➢ *Management Accounting Practices*

Previously, the organisation was mainly managed using financial data. With this methodology organisational performance is reviewed by an analysis of retrieved information from financial statements. Conventional management accounting practices, for example, budgeting systems and capital budgeting systems – IRR, NPV, and payback period are the company major's concern. Due to decreasing purchasing power during the economic crisis, the company had to reduce and control expenses. The company has established a strong customer relationship management system using membership cards. Providing product diversification, changing communication channels from conventional channels such as television, magazine and radio to modern media especially on-line, and establishing a R&D team to conduct consumer behaviour research are preventive measures taken by the company to meet the diverse and changing needs of its customers. However, BSC and target costing have not been implemented because the company's cost structure is not that complex. The company does

not adopt benchmarking because there are no standards or best practices amongst listed companies in SET for the same sectors. Account codes were established about a decade ago. Thus, there are limitations on the capacity to modify or replace the company's systems. It seems that tracking or identifying product costs is also a difficulty. As a result, ABC has not been implemented.

To sum up, organisation D is a consumer product company operating in the fashion sector as a distributor of products from both imports and affiliate productions. As a fashion product distributor, warehouse and government policy are main business risk considerations. The organisation aims for developing new brands to meet customer needs through a variety of distribution channels. The organisational chart indicates several layers in a hierarchical structure. The Board of Directors are of Thai nationality. A good employee is considered as working with honesty and loyalty. Oracle has been implemented along with a mixed picture of MAPs such as budgeting systems, capital budgeting systems and performance evaluation-customer satisfaction. A summary of key constructs of case companies is shown in table 6.5.

Table 6.5: Key Constructs of Case Study Organisations

	Company A	Company B	Company C	Company D
Industry	Consumer products: home and office products	Information and communication technology	Resources	Consumer products: fashion and beauty products
Listed on SET (year)	1993	2007	1993	1994
No. of employees (as of Dec 31, 2013)	4,287	4,700	1,029	7,767
Background highlights	– Released from the rehabilitation plan in 2002 – Competitive amongst group members – Risks: raw material price, competition of direct sale business and financial rations	– Sold nearly 30% outstanding shares to an international company in 2000 – Innovate to meet customer needs – Risks: laws and regulations related to the industrial type	– Implemented COSO ERM – Providing learning channel: Knowledge Management, cross-functional and cross-divisional group activities – Risks: environmental uncertainty	– Prevent impacts of intensity of marketing competition: Invested in R&D and technology, and establishing relationship with trading partners – Risks: stock management and political uncertainty
Nationality of Chairman	Thai	Thai	Thai	Thai

	Company A	Company B	Company C	Company D
Nationality of CEO	Thai	USA	Thai	Thai
No. of board of directors	20	12	14	11
No. of people on the board of directors who are not Thai (% of no. of board of directors)	0 (0%)	7 (58%)	0 (0%)	0 (0%)
No. of people on the board of directors who graduated /have experience abroad (% of no. of board of directors)	11 (55%)	11 (92%)	11 (79%)	7 (64%)
Main management layers (at least)	7	4	3	6
Strategies	Differentiation and innovation	Differentiation, innovation, and focus on customer needs	Differentiation, sustainability, and social and environmental friendly	Mixed differentiation and cost leadership, innovation and focus on customer needs
Implemented software	Oracle	Oracle	SAP	Oracle

Table 6.6: Management Accounting Practices across Case Companies

Management Accounting Practices (MAPs)	Companies			
	A	B	C	D
Conventional MAPs				
Budgeting system for controlling costs	x	x	x	x
Budgeting system for planning and control	x	x	x	x
Capital budgeting systems (Net Present Value; NPV, Internal Rate of Return; IRR, Payback period)	x	x	x	x
Cost-volume-profit analysis	x			
Formal strategic planning	x			
Long range forecasting	x			
Performance evaluation based on budget variance analysis	x	x	x	x
Performance evaluation based on cash flow return on investment	x	x	x	x
Performance evaluation based on division profit		x	x	x
Performance evaluation based on return (profit) on investment	x	x	x	x
Standard Costing	x			
Advanced MAPs				
Activity-based Budgeting (ABB)			x	
Activity-based Costing (ABC)		x	x	
Balanced Scorecard (BSC)			x	
Benchmarking	x	x	x	
Customer profitability analysis	x			
Environmental management accounting			x	
Just-in-Time (JIT)				x
Kaizen Costing	x			
KPI systems	x	x	x	x
Performance evaluation based on customer satisfaction surveys	x	x	x	x
Performance evaluation based on team performance	x	x	x	
Performance evaluation based on controllable profit	x	x		
Product profitability analysis	x			
Operation research techniques				x
Total Quality Management	x			

Note: x = the company has adopted the MAPs

6.3 Data Findings

The foundation for interview analysis ingrained in Abrahamson's (1991) typology of innovation diffusion due to explicit consideration factors associated with either decline of innovations or diffusion (Eija and Matias, 2013). Additionally, the case study approach aims to reveal further explanations of organisational culture based on studies by Reynolds (1986), Quinn et al. (1991), Liu (2002), Bhimani (2003) and Henri (2006).

The interview data were analysed following the framework on Abrahamson (1991). The size of the interview groups is seventeen from different executive management positions including four from company A three from company B, five from company C and five from company D (Chapter three, Table 3.1). The following sections provide interview data analysis related to the Abrahamson's perspectives: efficient-choice, fad, forced and fashion from the respondents' point of view; followed by additional culture perspectives.

6.3.1 Efficient-choice Perspective

Organisations within a group[47] will adopt efficient advanced MAPs in order to close performance gaps[48](Abrahamson, 1991). Malmi (1999) proposed that at the initial stage of MA innovation diffusion, the efficient choice perspective has the strongest explanatory power in explaining adoption behaviour in organisations; inside the group of adopting organisations is also a driving force for innovation diffusion. For example, statements such as "existing system not useful for management" and "process organisation requires new accounting" are often presented.

For organisations facing high levels of competition, a number of MAPs were used to obtain different types of information from their systems before making crucial decisions (Libby and Waterhouse, 1996). The market pressures provided a positive force for management accounting development to gain organisational economic profits (Mitchell and Walker, 1997). Interviewees of company C explained that:

> "…changing economic circumstances make our company need a risk management system which includes a risk management plan. The Key Performance Indicators (KPI) system is one of our plans to boost confidence in achieving the company's goal." – Head of division A

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[47] In this study, within a group is an organisation operates within the same sector.
[48] Performance gaps are discrepancies between an organisation's goals and the goals that this organisation can attain.

"I think it could be further emphasised because in the coming future, strategic performance management, for instance, the BSC and benchmarking will assist the organisation to articulate strategy in actionable terms facing intense market competition". – Head of division C

"To compete with our competitors and reduce the competition gap, we do survey every year to measure customer satisfaction." – Head of division B

Organisational strategies may impel advanced MAP adoption in an organisation. Due to a prospector strategy or differentiation strategy the company generally seeks to be the first to market with product or service innovations (Gerhart and Rynes, 2003, p. 236). Organisations are characterised by broad, changing product lines that require decentralised decision making to facilitate innovation, flexibility and rapid response to changing conditions (Ibid.). Therefore, prospectors are innovative organisations, managers tend to adopt innovations in accounting to enhance their decision-making and in operation management (Gosselin, 1997). Thus, organisational strategies are associated with advanced MAP adoption. Interviewees of company B stated:

"...as differentiation strategy; we tell everyone that we are unique. The unique will be decided by customer's value. Therefore, we do a customer satisfaction survey." – Head of corporate communications division

"Benchmarking is one of a direction to achieve our mission. We have to check our competitors' growth and then we will know what our target looks like; then plan how to compete our competitors and gain our targeted market share..." – Head of accounting division

"From the company's point of view, customers are the most important for us… Thus, we do more on customer relationship management…" – Head of IT division

Nevertheless, when business environment changes organisations in a group may tend to reject an advanced MAP and render a conventional MAP which may be less technically efficient in closing these organisations' performance gaps (Abrahamson, 1991, p. 593). Due to organisations changes of knowledge may introduce innovative substitutes that reveal new performance gaps or close old ones more efficiently (Ibid.). Interviewees revealed that

"…to reach a customer target group, we use social media such as Twitter or Facebook. Management accounting information such as budgeting and break-even point is only one part of decision-making. Personally, I'm focusing on commission and marketing perspectives…" – Direct sale director, Company A

"We have been using management accounting techniques which may not be called as balanced scorecard for management purposes – at least top management knows that what we are doing and what is our target." – CFO, Company A

"We don't actually implement balanced scorecard to be a real scorecard. In my opinion, Key Performance Indicator (KPI) is our scorecard but we don't call it such. It's pretty obsolete." – Head of accounting division, Company B

"I think management accounting information is useful but it's not necessary for me. I don't need the information to assist me day-to-day jobs in order to make decisions, planning and control. I have been using other tools instead." – Head of IT division, Company C

"For management accounting information, we don't think it'll yield any benefits to our organization. Also, we already have other administrative factors to be considered such as sales, cost, (or promotion), and strategies." – Vice president accounting and finance, Company D

Bjørnenak (1997) and Chongruksut (2005) argued that a "lack of knowledge" may be a possible reason for not adopting advanced MAPs as well as an "uncertainty of the advanced MAP benefits" (Nassar *et al.*, 2011). Some interviewees reported:

"…however, we might need some systems at least better than what we are doing now." – CFO, Company A

"...we also think about implementing advanced management accounting practices such as activity-based costing, but we aren't sure about their application." – Accounting manager, Company A

"...I think we don't have good enough understanding about advanced management accounting techniques...personally, I think the techniques provide a small (less) benefit because it is too abstract to apply at the division level…" – Head of IT division, Company B

"I think management accounting information is useful even though our company is sensitive about it. I don't get how to design cost centre and a responsibility centre. I just want to know how many resources use for making products or services..." – Vice president IT divisions, Company D

Innes *et al.* (2000) also suggested that non-advanced MAP users concerned financial benefits outweighed implementation costs and doubted about technical credibility as well as adequacy of resources was required during implementation processes (Sandra *et al.*, 2005). These lead to non-adoption in a Thai organisation as a CFO of company A said:

"Balance Scorecard needs a lot of resources to support it; we have a long way to go. Without adopting a lot of resources, we are doing it in the sense of we link our region, strategic and position to Key Performance indicator (KPI)."

Malmi (1999) and (Nassar *et al.* (2011)) indicated that reasons for advanced MAP diffusion could be because of "existing system not reliable or not useful for management". Interviewees argued that they believe in their current management accounting information in term of sufficient enough to use as part of decision-making and for management as remarked:

> "Our company is quite large and sells a lot of various goods. Today, standard costing is just ok to provide management accounting information." – Accounting manager, Company A

> "…If we want to improve our products or bring superior experiences to customers, they can be definitely approved by our traditional management accounting techniques. The advantages of the traditional management accounting techniques help us make a decision for spending or investing quickly and possess competitive advantages over our rivals." – Head of IT division, Company B

> "We don't use Balance scorecard (BSC), target costing because our cost is not complicated and we don't compare with benchmarking that isn't exposed. Especially, BSC isn't worked with our business." – CFO, Company D

> "…although we have authority to make a decision in our department, we have not used Activity-based Costing (ABC) techniques. Our system has still been traditional management accounting. If we want to develop a new product, the freeze project or general processing will be possible." – Head of division, Company D

As efficient-choice perspective, motives for adopting advanced MAPs could be "process organisation requires new accounting", "gain competitive advantages" and "adopting differentiation strategy". However, the possible reasons for rejection of the advanced MAPs may be "substitute innovations", "lack of knowledge", "uncertainty of the advanced MAP benefits", "cost-benefits concern" and "existing system reliable and useful for management".

6.3.2 Forced Perspective

Abrahamson (1991, p. 594) explained reasons for rejections based on forced-selection perspective as "a group of organisations will tend to reject a technically efficient innovation when organisations, outside this group, exert political pressures to reject this innovation, have greater power than those exerting pressures to retain it.". Interviewees indicate that a "lack of autonomy" may be a reason against advanced MAP adoption:

> "We are one company in a group which must adopt International Financial Reporting Standards (IFRS) for standardised issue… an accounting standard of our business type does not ask for activity-based costing techniques." – Head of accounting division, Company B

> "...we have to do accounting with a standard because our company is a member of the Stock Exchange of Thailand...the accounting standard does not mention for management accounting which should be used in a company as our business sector" – Vice president IT divisions, Company D

6.3.3 Fad and Fashion Perspective

Fad and fashion perspectives assume that diffusion of innovation occurs under conditions of uncertainty because organisations imitate other organisations' adoption decisions Abrahamson (1991, p. 597).

➢ *Fad Perspective*

Fad perspective occurs when organisations within a group imitate other organisations within that group. Nassar et al. (2011, p.193) indicated that organisations imitate other organisations because of three reasons: communication of knowledge, social interactions, or economic interests. According to the interview findings, a head of IT division of company B stated:

"…as a group, every year our company hires an outsourcing company to do a benchmark of our industry. We can know how much money each company in our group spends. From this benchmark, business units can see where their targets are and what they will do."

Similarly, the SOEs that had Joint Ventures (JV) with foreign partners tended to have higher diffusion indices than did their non-JV partner (USA and Europe versus others) due to the diffusion of accounting ideas from foreign enterprises to local organisations (Firth, 1996).

In addition, organisations imitate advanced MAP in order to avoid risk that their competitors will gain a competitive advantage by using those MAPs (Zbaracki, 1998; Nassar *et al.*, 2011). Interviewees from company C were consistent in their views:

"Activity-based budgeting has been used in our company the same as a leading company within the same industry sector." – Assistant vice president in accounting

"Our organisation aims to be at least the second company on the resource sector ranking. Thus, the top rank amongst resource companies is used for benchmarking." – Head of division B

"BSC has been used in our company as same as the way of the leading companies within similar industry." – Head of division B

The fad perspective seems to influence advanced MAP adoption, benchmarking, ABB and BSC in particular in case companies.

➢ *Fashion Perspective*

Fashion perspective occurs when organisations in a group imitate other organisations (i.e. management consulting firms). Modell (2009) suggested that learning entails important elements of serendipity and rationality as organisations experiment with various innovations as same as the fashion perspective which provide important inputs to diffusion processes. Interviewees underlined these views as follow:

> "I have applied Japanese management accounting techniques (i.e. target costing) in our company. I received Japan scholarship and have trained in Japan for 2 times. The techniques are tools to help us manage the production process and make a decision precisely." – Senior factory director, Company A

> "We use performance evaluation – customer satisfaction survey called NPS (Net Promoter Scores) as a part of satisfaction survey or loyalty survey. I study it from a textbook and I applied it in my previous company." – Head of IT division, Company B

A summary of interview findings illustrates in table 6.7. It seems that efficient-choice perspective is dominant facilitators advanced MAP adoption, followed by attribute of fad and fashion perspectives. The barriers, in turn, are attributes of efficient-choice and forced perspectives. In terms of position aspect, it seems that advanced MAPs diffuse amongst only head of division position. A majority of employees who have been working in accounting department declared against the advanced MAP adoption. These differ from employees who have been working in non-accounting departments. In terms of company aspect, interviewees of company A and D placed considerable emphasis on rejection of advanced MAPs whereas company B and C had a great concern with advanced MAP diffusion. It could be noted that company B has foreign CEO (USA) and more than half of Board of Director are not of Thai nationality (Table 6.5). Moreover, the possible reasons behind these phenomenon may be because of different organisational culture in each case organisation. Therefore, organisational culture is further investigated in the next section.

Table 6.7: The Frequency of Motives for Adopting/Non-adopting Advanced MAPs

Perspectives	Position						Total
	Executive officer		Senior director		Senior manager		
	IT	Accounting	Non-Accounting	Accounting	Non-Accounting	Accounting	
Efficient-choice	-1(D)	-3(A) -2(D)	+2(B) +3(C) -2(B) -1(C) -1(D)	+1(B) -1(B)	-1(A)	-2(A)	
Total	-1	-5	+5/-4	+1/-1	-1	-2	+6/ -14
Forced	-1(D)			-1(B)			
Total	-1			-1			-2
Fad		+1(C)	+1(B) +2(C)				
Total		+1	+3				+4
Fashion			+1(A) +1(B)				
Total			+2				+2
Accounting/non-accounting department	-2	+1/-5	+10/-4	+1/-2	-1	-2	

Note: + diffusion, - rejection and (A, B, C, D) = company A, company B, company C and company D

6.4 Culture Perspective

Organisational culture which is a set of beliefs and values shared amongst employees in an organisation may emerge through forms of training, working practice, leadership style and perception (Reynolds, 1986; Hofstede et al., 1990; Modell, 2009, p. 71). It may influence employee's perceptions of the success of MA systems changes (Bhimani, 2003; Henri, 2006).

6.4.1 Interview Findings

As such, there exists a set belief or culture amongst staff members. Interviewees conform to the familiar ways of completing tasks, or the so called norm. Any deviation from the norm is difficult to be implemented. In this context, interviewees explain reasons for adopting advanced MAPs as mentioned:

"A trend of using non-financial performance measures is dependent on executive's opinion. He tells us that it's possible, we will do it….. If CFO approves to adopt any advanced management accounting practices, we are willing to do. Sometimes, we may not understand their functions profoundly." – Accounting manager, Company A

"…when employees aren't willing to do the way their manager's decided, they won't tell managers how they feel. It's Thai style. They do a job because manager gives them orders." – Accounting manager, Company A

"In the past, everyone thought that we only care about financial results. The CEO said that we may lose a chance to do something if we depend on only money. Therefore, we have combined marketing programmes with the financial in the real business." – Vice president accounting and finance, Company D

"The CEO issues a policy. Paying bonus for each division depends on performances which are based on net profit, gross margin and sales compared with previous year. A weighted average is used to measure performance which is compared with the average of company performance. Then, we evaluate each division performance to get its level." – Vice president accounting and finance, Company D

Yet, there are some reasons against advanced MAP adoption as stated:

"We've not used Balanced Scorecard because we think it is not suitable for our people and our organisation processes. Relationship, belief, and hope in organization which must remain in employees' minds are more important than performance measurement." – Direct sales director, Company A

"Personally, I think, it's hard to make some change happen in our organisation. If activity-based costing is used by some groups or factories, it won't be a good idea. It affects costing differently when we have to close accounting every month….we don't think it's a suitable time to adopt any advance management accounting techniques." – Accounting manager, Company A

"Our company style is drawn 80% from Thai culture. It's inflexible when we want to change something. The change can be made when employees are professional enough to promote their perspectives." –Head of corporate communications division, Company B

"We don't use BSC because CEO tells us to believe in our executives. They control the old generation to follow their direction. Members of the new generation who are assertive can't work here and they quit their jobs." – Vice president accounting and finance, Company D

"BSC isn't worked with our business because we have our own concept. Someone tells us that we should write a mission and an objective that are compatible with BSC; but they still oppose with our concept." – Vice president accounting and finance, Company D

It is evident that Thai's organisational culture affects practically every decision on advanced MAP adoption such as ABC, BSC and non-financial performance measurements.

6.4.2 Interview Questionnaire Findings

This section presents the possible existence of association between organisational culture and MAP adoption based on studies of (Reynolds, 1986)[49], (Bhimani, 2003) and (Henri, 2006)[50].

The interviewees were asked to complete an organisational culture questionnaire (see Appendix H) at the end of the interview. In the analysis section an interviewee's position is classified as executive officer (including vice president, assistant vice president and CFO), senior director (head of division and senior director) and senior manager (manager and director) (Chapter three, Table 3.1) to test Reynolds's (1986) findings. However, to test previous findings of Bhimani (2003) and Henri (2006) interviewees were classified as accounting or non-accounting to examine whether different groups of MAPs users have a different perception on the usage. The accounting group includes CFO and accounting manager whereas other positions of interviewees are classified as the non-accounting group.

A non-parametric test, the Kuskul-Wallis one way ANOVA, is used to discover differences amongst the four case studies in relation to perception of work contexts and the perceived success of MA systems. The Kruskul-Wallis test established statistically significant differences on four out of twenty dimensions based upon the mean ranks. The results are shown in table 6.8. However, the comparisons between individual pairings of company groups have not been tested by the Kruskul-Wallis statistic. Thus, each pair having a significant difference has to be identified by calculating critical difference and comparing the critical difference with the absolute difference of the pairing. The results indicate that there are substantive differences on four dimensions: external versus internal emphasis on organisational activities, individual versus collective decision making, simple versus complex organisation, and ignorance versus knowledge of organisational expectations. Firstly, it can be seen that on the external versus internal dimension there are significant differences between company A and company B, and between company B and both company C and company D. This can be explained as company A concentrates on a combination of both external and internal activities during the organisational meeting whereas company B seems to concentrate more on external organisation issues than company C and company D (Table 6.9). Secondly,

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[49] Reynold (1986) indicated that there was an association between organisational position and perceived work context.

[50] Studies of Bhimani (2003) and Henri (2006) drawn on a competing value model (chapter two, section 2.7.3) proposed that there was a relationship between a number of MAP usage and groups of user who reflecting different competing value.

the results of the Kruskal-Wallis test shown in table 6.8 indicate that a significant difference exists between the four companies in relation to either individual decision-making or group decision-making. The pairwise comparison test indicates significant differences between company D and companies A, B and C. The Median test (Table 6.9) suggests that there are individual decisions which are made and processed by key individuals in company D, while company B emphasises group decisions collected from various levels of individuals. An emphasis on both individual decisions and group decisions has been found in company A and C. Thirdly, the pairwise comparisons reveal a significant difference between company A and company C, and between company A and company D on simplicity versus complexity dimensions (Table 6.8). These results suggest a tendency for company A to develop elaborate procedures and structures. Most employees in company A seem to know what is going on in the company and are knowledgeable of the company's policies after a few years, but some never figure it out whereas employees in company C and D take about a year to learn structures and political processes within the companies and get to know the people (Table 6.9). Lastly, the pairwise comparisons show significant differences between company A and company C and between company C and company D in relation to either ignorance of organisation or knowledge of organisation (Table 6.8). These suggest that individual members in company A and D know about what they are expected to do and have some ideas about how their work will contribute to the accomplishment of organizational tasks, while individual members in company C know what they are expected to do and how their work will contribute to the accomplishment of organizational tasks (Table 6.9).

No organisation identifies with only one culture, different organisations might have different organisational characteristics (Bhimani, 2003). Table 6.8 (number 17-20) shows, the mean ranks of the organisational culture based on competing value model regarding Bhimani's (2003) study. The interviewees were asked to distribute 100 points amongst four descriptions based on how similar the description is to the interviewees' department. The results indicate that none of the four organisational dimensions has a significant association with advanced MAPs. It implies that there is no difference between perceptions of advanced MAPs usage amongst case companies regarding competing value model. However, the difference between organisational positions including accounting and non-accounting perception in each company has been further investigated.

Table 6.8: Results of Kruskal-Wallis One-way ANOVA for Different between Work Context and Case Organisations

	Aspects of work context		Company A (n=4)	Company B (n=3)	Company C (n=5)	Company D (n=5)	K-W statistic (df=3)
1	External vs. Internal emphasis						
		Mean rank	10.75	2.83	11.10	9.20	6.832*
		Pairwise comparisons					
		Company A		7.92**	0.35	1.55	
				(3.21)	(0.22)	(0.9)	
		Company B			8.27**	6.37*	
					(3.73)	(3.2)	
		Company C				1.9	
						(1.2)	
2	Task vs. Social focus						
		Mean rank	7.63	7.17	12.5	7.7	4.313
3	Safety vs. Risk						
		Mean rank	8.75	11.5	8	8.7	1.157
4	Conformity vs. Individuality						
		Mean rank	7.25	10.33	7.3	11.3	2.744
5	Individual Rewards vs. Group rewards						
		Mean rank	10.38	9	5.2	11.7	5.025
6	Individual- vs. group decision-making						
		Mean rank	10.63	14.17	9.5	4.1	8.684**
		Pairwise comparisons					

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	Aspects of work context		Company A (n=4)	Company B (n=3)	Company C (n=5)	Company D (n=5)	K-W statistic (df=3)
		Company A		3.25	5.38	7.00**	
				(5.00)	(4.70)	(3.40)	
		Company B			6.17	7.00**	
					(3.50)	(3.00)	
		Company C				7.30**	
						(3.70)	
7	Centralised vs. Decentralised decision-making						
		Mean rank	7.25	10.17	9.8	8.9	1.06
8	Ad Hockery vs. Planning						
		Mean rank	8.5	6.17	11.6	8.5	3.644
9	Stability vs. Innovation						
		Mean rank	8.63	12.83	7.3	8.7	2.95
10	Simple vs. Complex organisation						
		Mean rank	12.75	11.67	6.7	6.7	6.555*
		Pairwise comparisons					
		Company A		4.25	6.75*	6.75*	
				(3.67)	(3.60)	(3.60)	
		Company B			6.00	6.00	
					3.60	3.60	
		Company C				5.50	
						(5.50)	

	Aspects of work context		Company A (n=4)	Company B (n=3)	Company C (n=5)	Company D (n=5)	K-W statistic (df=3)
11	Informal vs. Formalised procedures						
		Mean rank	6.25	8	11.2	9.6	4.232
12	High vs. Low Loyalty						
		Mean rank	6.5	9.33	10.5	9.3	1.632
13	Ignorance of Organisation vs. Knowledge of Organisation						
		Mean rank	6.88	10.83	12.7	5.9	7.266*
		Pairwise comparisons					
		Company A		3.25	3.25*	5.38	
				(5.00)	(6.40)	(4.70)	
		Company B			3.83	6.00	
					4.90	(3.60)	
		Company C				7.40**	
						(3.60)	
14	Manager vs. professional dominant						
		Mean rank	7.75	7	10.1	10.1	1.341
15	Internal Competitive vs. Internal Co-operative						
		Mean rank	7.13	13.17	7.4	9.6	3.487

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	Aspects of work context		Company A (n=4)	Company B (n=3)	Company C (n=5)	Company D (n=5)	K-W statistic (df=3)
16	Co-operative (facing external competition) vs. Non-Co-operative						
		Mean rank	11.13	4.83	8.1	10.7	4.453
17	Group Culture Orientation						
		Mean rank	4.63	12	8.2	11.5	5.439
18	Developmental Culture Orientation						
		Mean rank	11.13	9.33	7.7	8.4	1.139
19	Hierarchical Culture Orientation						
		Mean rank	10.88	7.83	9.2	8	0.918
20	Rational Culture Orientation						
		Mean rank	10.13	7.17	10.5	7.7	1.378

Note: Values in cells of pairwise comparisons are mean rank between the pair. For example, a pairwise comparison between company A and company B are presented as mean rank of company A and (mean rank of company B); *p-value <0.10; **p-value<0.05

Table 6.9: Median of Work Context amongst Case Studies

	Aspects of work context	Company A (n=4)	Company B (n=3)	Company C (n=5)	Company D (n=5)
1	External vs. Internal	3.00	1.00	3.00	2.00
2	Task vs. Social	2.00	2.00	3.00	2.00
3	Safety vs. Risk	2.50	3.00	2.00	3.00
4	Conformity vs. Individuality	3.00	4.00	3.00	4.00
5	Individual Rewards vs. Group Rewards	3.50	3.00	2.00	4.00
6	Individual Decisions vs. Group Decisions	3.00	5.00	3.00	1.00
7	Centralised vs. Decentralised	2.00	2.00	2.00	2.00
8	Ad Hock vs. Planning	3.00	1.00	3.00	3.00
9	Stability vs. Innovation	3.00	4.00	3.00	3.00
10	Simple vs. Complex organisation	2.50	2.00	2.00	2.00
11	Informal vs. Formalised procedures	3.00	3.00	3.00	3.00
12	High vs. Low Loyalty	1.50	2.00	2.00	2.00
13	Ignorance of Organisation vs. Knowledge of Organisation	4.00	4.00	5.00	4.00
14	Manager -vs. professional dominant	4.00	3.00	4.00	5.00
15	Internal Competitive vs. Internal Co-operative	3.00	4.00	2.00	3.00
16	Co-operative (facing external competition) vs. Non-Co-operative	2.00	1.00	2.00	2.00
17	Group Culture Orientation*	8.75	56.25	25.00	32.50
18	Developmental Culture Orientation*	24.38	21.25	15.00	15.00
19	Hierarchical Culture Orientation*	36.25	22.50	35.00	22.50
20	Rational Culture Orientation*	31.25	3.75	35.00	15.00

* Organisational culture dimensions based on competing value model

Regarding, Reynolds (1986) found that there were differences of work value amongst different organisational positions. Moreover, studies of (Bhimani, 2003) and (Henri, 2006) indicated that organisational culture elements which changed as a result of the design of MA system innovation may influence MA usage. Thus, the following section aims to test the perceived work context amongst different positions (executive officer, senior director and senior manager) using the Kruskal Wallis test.

As shown in table 6.10, there are significant differences between different positions and organisational culture in three dimensions: informal vs. formalised procedures, "hierarchical" and "rational" culture. The degree of difference is explained in table 6.11.

First, it can be seen that on the informal vs. formalised procedures there is a significant difference only between executive officer and senior director. It can be implied that although executive officer and senior director would involve verbal discussions and approval on major issues, executive officer may place greater emphasis on discussion regarding minor matters more than senior director.

Second, "hierarchical" culture which reflects the values and norms associated with bureaucracy influences organisational positions. It seems that senior manager may play an important role on formal rules and regulations more than executive officer and senior director, respectively. Thus, senior director and executive officer may tend to use more advanced MAPs than senior manager in order to focus organisational attention.

Third, a dimension called "rational" culture focuses on achievement and individual motivation comes from the meritocracy-based belief associates with organisational positions. Regarding a pairwise comparison, it seems that a senior director position perceive "rational" culture more than a senior manager position. It may imply that the senior director puts more emphasis on achievement and organisational rewards than does the senior manager.

Table 6.10: Results of Kruskal-Wallis One-way ANOVA for Different between Work Context and Organisational Positions

	Aspects of work context		Positions			K-W statistic (df=2)
			Executive officer (n=4)	Senior director (n=9)	Senior manager (n=4)	
1	External vs. Internal emphasis					
		Mean rank	8.00	10.14	9.00	0.788
2	Task vs. Social focus					
		Mean rank	9.50	7.93	10.75	0.798
3	Safety vs. Risk					
		Mean rank	7.88	10.36	8.75	1.096
4	Conformity vs. Individuality					
		Mean rank	8.44	9.79	8.50	0.345
5	Individual Rewards vs. Group rewards					
		Mean rank	9.31	9.43	6.25	0.743
6	Individual- vs. group decision-making					
		Mean rank	9.38	8.86	8.00	0.134
7	Centralised vs. Decentralised decision-making					
		Mean rank	7.44	10.00	11.75	2.255
8	Ad Hockery vs. Planning					
		Mean rank	7.63	10.71	8.50	2.194
9	Stability vs. Innovation					
		Mean rank	8.63	8.36	12.75	1.592
10	Simple vs. Complex organisation					
		Mean rank	9.00	9.29	8.00	0.184

	Aspects of work context		Executive officer (n=4)	Senior director (n=9)	Senior manager (n=4)	K-W statistic (df=2)
				Positions		
11	Informal vs. Formalised procedures					
		Mean rank	11.50	6.00	9.50	5.003*
		Pairwise comparisons				
		Executive officer		10.13**	5.88	
				(5.57)	(4.00)	
		Senior director			4.43	
					(7.00)	
12	High vs. Low Loyalty					
		Mean rank	8.25	9.36	10.75	0.509
13	Ignorance of Organisation vs. Knowledge of Organisation					
		Mean rank	8.63	10.50	5.25	2.261
14	Manager vs. professional dominant					
		Mean rank	10.25	7.71	8.50	1.061
15	Internal Competitive vs. Internal Co-operative					
		Mean rank	8.56	8.43	12.75	1.605
16	Co-operative (facing external competition) vs. Non-Co-operative					
		Mean rank	10.31	7.43	9.25	1.567
17	Group Culture Orientation					
		Mean rank	9.44	9.71	4.75	1.625

	Aspects of work context		Positions			K-W statistic (df=2)
			Executive officer (n=4)	Senior director (n=9)	Senior manager (n=4)	
18	Developmental Culture Orientation					
		Mean rank	9.50	7.79	11.25	0.892
19	Hierarchical Culture Orientation					
		Mean rank	10.06	5.79	16.00	7.051**
		Pairwise comparisons				
		Executive officer		9.94*	4.63*	
				(5.79)	(9.00)	
		Senior director			4.00**	
					(8.50)	
20	Rational Culture Orientation					
		Mean rank	7.88	11.86	3.50	5.054*
		Pairwise comparisons				
		Executive officer		6.38	6.00	
				(9.86)	(3.50)	
		Senior director			6.00**	
					(1.50)	

Note: Values in cells of pairwise comparisons are mean rank between the pair. For example, a pairwise comparison between company A and company B are presented as mean rank of company A and (mean rank of company B); *p-value <0.10; **p-value<0.05

Table 6.11: Median of Work Context amongst Different Positions

	Aspects of work context	Executive officer (n=8)	Director (n=7)	Manager (n=2)
1	External vs. Internal	2.50	3.00	2.50
2	Task vs. Social	3.00	2.00	3.00
3	Safety vs. Risk	2.00	3.00	2.50
4	Conformity vs. Individuality	3.00	3.00	3.50
5	Individual Rewards vs. Group Rewards	3.00	3.00	2.50
6	Individual Decisions vs. Group Decisions	3.00	2.00	2.50
7	Centralised vs. Decentralised	2.00	2.00	3.00
8	Ad Hock vs. Planning	3.00	3.00	3.00
9	Stability vs. Innovation	3.00	3.00	4.00
10	Simple vs. Complex organisation	2.00	2.00	2.00
11	Informal vs. Formalised procedures	2.50	1.00	2.00
12	High vs. Low Loyalty	4.00	4.00	4.50
13	Ignorance of Organisation vs. Knowledge of Organisation	4.00	4.00	3.50
14	Manager -vs. professional dominant	3.50	3.00	3.00
15	Internal Competitive vs. Internal Co-operative	2.00	2.00	2.50
16	Co-operative (facing external competition) vs. Non-Co-operative	3.00	3.00	3.00
17	Group Culture Orientation*	28.75	31.25	13.75
18	Developmental Culture Orientation*	19.37	15.00	20.00
19	Hierarchical Culture Orientation*	28.75	15.00	61.25
20	Rational Culture Orientation*	21.25	32.50	5.00

On the basis of results presents in table 6.8 – 6.11, an association between nature of organisations, organisational positions and organisational culture (perceived work context and perceived system success) has been found. As the nature of organisation aspect, company A seems to develop elaborate procedure and structure and take longer for employees to learn than company C and D. Company A may take a longer time to implement any advanced

MAPs than company C and D due to its nature. Company B, in turn, tends to focus on external tasks such as satisfying customers and clients more than other companies. This is consistent with the company's strategy which is presented in section 6.2.2. Hence, advanced MAPs related to customer satisfaction would be perceived as yielding high benefits and success in company B. The statistical evidence indicates company C has higher degree to which individual members know what the company expects them to do and how their efforts will contribute to the accomplishment of organisational tasks than company A and D. It seems that company C has a higher possibility of success in management accounting practice adoption compared with company A and D. Lastly, the nature of company D is that individuals make the major decisions and proceed with implementation. This statistical test is consistent with an interviewee's view which is stated in section 6.4.1. It would suggest that advanced MAP could be diffused or rejected in company D based on top management – CEO, in particular.

In the aspect of organisational position (Table 6.10 – 6.11), seventeen interviewees were classified into three groups based on level of their positions: executive officer, senior director and senior manager. The statistical evidence illustrates the relationship between organisational positions and three organisational dimensions: informal vs. formalised procedures, "hierarchical" and "rational" culture. These would suggest that a senior director position is involved in verbal discussions and has little discussion regarding minor issues more than an executive officer position. However, it could note that both positions perceived an informal procedure. Next, a senior manager reflects the highest "hierarchical" culture element. It seems that this position focuses on the relevance of control and internal concern. Individuals' actions are directed by formal roles and work situations with sufficient co-ordination and a sense of security. Thus, employees who work in this position tend to use few advanced MAPs to support strategic decision-making and organisational interests. Lastly, a group of senior directors reflects "rational" culture element more than a group of senior managers. The senior director focuses more on external factors and stresses control more than the senior manager. Regarding Henri's (2006) study, top manager who reflect a control dominant – "rational" and "hierarchical" – seems to use few advanced MAPs. It may be suggested that senior directors and senior managers tend to perceive less benefits from and use fewer advanced MAP.

The next section aims to investigate whether different groups of MA systems users had significantly influenced the perceived success of the new system as suggested by (Bhimani, 2003; Henri, 2006). Four organisational culture elements namely "group", "developmental",

"hierarchical" and "rational" culture became embedded in the design of advanced MA system has been further examined in the following section.

Table 6.12 – 6.15 reveal dimensions of organisational culture perceptions compared with people from two departments, accounting and non-accounting (i.e. managers from information technology, sales and marketing) departments. The median of the four culture elements amongst different top manager departments presents in table 6.16. The interpretation of the Mann-Whitney test are following:

First, the different "group" culture perception between accounting department and non-accounting department has been shown in table 6.12. "Group" culture is based on norms and values associated with affiliation. It emphasises cohesion, morale, member participation in decision making and human resource development (Bhimani, 2003). The findings indicate in company B people from the accounting department perceive "group" culture differently from the non-accounting department. It implies that the CFO might emphasis flexibility and member participation in decision making less than non-accounting officers (Table 6.16).

Table 6.12: Mann-Whitney Test of "Group" Culture Orientation of Accounting and Non-accounting Departments

Company	Department	Mean rank	Sum of ranks	Mann-Whitney	Wilcoxson	Z	Asymp. Sig. (2-tailed)
A	Accounting	7.69	61.50	25.50	61.50	-0.785	0.432
	Non-Accounting	9.31	74.50				
B	Accounting	3.63	14.50	4.50	14.50	-1.985	0.047
	Non-Accounting	7.94	63.50				
C	Accounting	7.63	30.50	20.50	30.50	-1.107	0.268
	Non-Accounting	11.22	179.50				
D	Accounting	9.31	74.50	38.50	74.50	-0.743	0.457
	Non-Accounting	11.29	135.50				

Second, table 6.13 illustrates a comparison of "developmental" culture perceptions between people from the accounting department: a CFO and an accounting manager and the non-accounting department. It can be seen that no significant differences between accounting department officers and non-accounting department officers were exhibited in companies A, C and D. However, findings suggest that accounting positions, will indicate lower developmental culture scores than non-accounting positions in company B (Table 6.16). Top managers in organisations which reflect a developmental culture orientation – stresses flexibility and an external focus is permeated by assumptions of dynamic change – tend to more highly use performance measures (Henri, 2006). These might imply that non-accounting officers in company B perceived advanced management accounting procedures to provide more useful information than do accounting officers.

Table 6.13: Mann-Whitney Test of "Developmental" Culture Orientation of Accounting and Non-accounting Departments

Company	Department	Mean rank	Sum of ranks	Mann-Whitney	Wilcoxson	Z	Asymp. Sig. (2-tailed)
A	Accounting	6.88	55	19	55	-1.46	0.144
	Non-Accounting	10.13	81				
B	Accounting	3.63	14.50	4.50	14.50	-2.021	0.043
	Non-Accounting	7.94	63.50				
C	Accounting	9.13	36.50	26.50	36.50	-0.56	0.575
	Non-Accounting	10.84	173.50				
D	Accounting	9.94	79.50	43.50	79.50	-0.358	0.721
	Non-Accounting	10.88	130.50				

Next, "hierarchical" culture reflects values and norms associated with bureaucracy, individuals' actions are directed by formally delineated roles and enforced by rules and regulations (Bhimani, 2003). Actions are associated with the use of advanced MAP namely performance measurement systems (PMS) (Henri, 2006). The hierarchical culture perceptions differences between accounting and non-accounting officers in four companies are presented in table 6.14. There is a significant difference of perception on a hierarchical orientation between accounting officers, CFOs and accounting managers, and non-accounting officers in company A and D. It seems that CFO and accounting managers focus more on orderly work situations with sufficient co-ordination and distribution to provide organisational participants with a sense of security, continuity and stability than non-accounting officers (Table 6.16).

Table 6.14: Mann-Whitney Test of "Hierarchical" Culture Orientation of Accounting and Non-accounting Departments

Company	Department	Mean rank	Sum of ranks	Mann-Whitney	Wilcoxson	Z	Asymp. Sig. (2-tailed)
A	Accounting	11	88	12	48	-2.12	0.034
	Non-Accounting	6	48				
B	Accounting	8	32	10	46	-1.065	0.287
	Non-Accounting	5.75	46				
C	Accounting	11.75	47	27	163	-0.491	0.624
	Non-Accounting	10.19	163				
D	Accounting	14	112	20	98	-2.204	0.028
	Non-Accounting	8.17	98				

Lastly, the "rational" culture findings illustrate significant difference between accounting and non-accounting departments in company A, B and C (Table 6.15). The CFOs and accounting managers in company A and C perceive "rational" culture less important than managers from non-accounting departments contrary to the findings for company B. As table 6.16, it might imply that the CFO and the accounting managers in company A and C place an emphasis on achievement and individual motivation which comes from competent performance and organisational rewards less than managers from non-accounting departments. The findings in company B might be the reverse.

Table 6.15: Mann-Whitney Test of "Rational" Culture Orientation of Accounting and Non-accounting Departments

Company	Department	Mean rank	Sum of ranks	Mann-Whitney	Wilcoxson	Z	Asymp. Sig. (2-tailed)
A	Accounting	6.38	51.00	15.00	51.00	-1.871	0.061
	Non-Accounting	10.63	85.00				
B	Accounting	10.25	41.00	1.00	37.00	-2.841	0.004
	Non-Accounting	4.63	37.00				
C	Accounting	4.00	16.00	6.00	16.00	-2.526	0.012
	Non-Accounting	12.13	194.00				
D	Accounting	10.56	84.50	47.50	125.50	-0.040	0.968
	Non-Accounting	10.46	125.50				

Table 6.16: Median of Culture Elements amongst Different Top Manager Departments

Company		Organizational culture elements			
A		Group	Developmental	Hierarchical	Rational
	Non-accounting managers (n=2)	15.63	24.38	20.00	40.00
	Accounting managers (n=2)	8.75	16.25	60.00	15.00
B					
	Non-accounting managers (n=2)	56.25	22.50	19.38	1.88
	Accounting managers (n=1)	13.75	13.75	32.50	40.00
C					
	Non-accounting managers (n=4)	23.75	13.75	25.00	36.25
	Accounting managers (n=1)	25.00	25.00	50.00	0.00
D					
	Non-accounting managers (n=3)	32.50	23.75	17.50	15.00
	Accounting managers (n=2)	31.25	13.75	36.25	18.75

To sum up, there are significant differences between managers from accounting and non-accounting departments across different organisational culture types. The CFOs and the accounting managers, the accounting department, will indicate lower "developmental" cultures scores than the managers from non-accounting departments in company A, B and D. In contrast, "group" culture might be indicated by the CFOs and the accounting managers higher than employees from non-accounting departments in company C and D, "hierarchical" culture in company D and "rational" culture in company C.

6.5 Synergy between MAPs and IISs

From the questionnaire findings in chapter five, the results indicated that IIS has a positive impacted on MAP adoption. IIS implementation also has a positive significant impact on organisational performance. However, there is no interaction effect of MAPs and IISs on organisational financial performance. Interviewees declared possible supplementary explanations as follows:

Interview findings confirmed that IIS implementation facilitate MAP usage in areas of reporting, data collection and analysis. For instance,

> "Before implementing Oracle, we could not do reports such as budgeting, cash flow, and financial KPI as fast as after Oracle was implemented." – CFO, Company A

> "Oracle is used as a database which helps us to collect loads of organisational information." – CFO, Company A

> "Oracle supports data collection and reporting. After implementing Oracle, we have more information to do comparisons between budget and actual costs than before. It also supports us with tools. We can print expense analysis report up-to-date every day, but in the past we had to wait for an accounting close." – Accounting manager, Company A

> "Oracle is supporting our work. For example, when they do budget or forecast, it will fix in Oracle automatically. As a result, nobody can spend over budget." – Head of accounting division, Company B

Although questionnaire findings revealed that IIS implementation facilitated MAP adoption, some interviewees argued that:

"Oracle is not intensive. We have to group some accounts that are of the same nature. Grouping may not support our analysis or do whatever because they're retrieved in a pool view." – Head of accounting division, Company B

Additionally, some evidence reveals that accounting legacy systems may impede IIS implementation to support MAP adoption. One of interviewees mentioned that

"Previously, an accounting manager used to adjust an account code's structure that had been used at the beginning. When the company was enlarged, the account code couldn't support a job….because of having many systems it's hard to fix. We have to change all systems' mapping that relate to a group account code….There are a lot of effects." – Accounting manager, Company D

To conclude, questionnaire results and some interviewees indicate that IIS implementation supports MAP adoption. However, accounting legacy systems may be an obstacle of IIS to facilitate advanced MAP adoption.

Lastly, no significant interaction of MAP adoption and IIS implementations on organisational performance have been found from this survey. Possible explanations suggested by interviewees are generic features of IIS such as 'standardisation and user friendly' were not suitable for their organisations; IISs did not provide all information to support manager requirements for decision-making as mentioned:

"I think the standardisation on the Oracle system is awful. It might be good for a database but we do have some customization requirements to serve our users and we have to import by excel because the standard report is not quite user friendly."— CFO, Company A

"The data in Oracle cannot immediately be used for decision making. Oracle simply shows the total revenue and cost, but it does not indicate how much cost increases or decreases nor why. … So, we need other systems to facilitate our decision making." – Head of accounting division, Company B

"Although we have implemented integrated information system, we still use Excel for some parts of reporting and analysis….to retrieve information that provides multiple perspectives for executives, Excel is flexible and beneficial." – Vice President Accounting and Finance, Company D

As stated above, communication between accounting users and the implementation team during collecting requirements may be a concern. Then, accounting users should have appropriate training after IIS is implemented to be able to retrieve data that they need from the system. As changing from manual to electronic database, users who are not familiar with the new systems and lack training may not be able to use data efficiently to enhance organisational performance. Another explanation is MA (either conventional or advanced) systems are separately operating from IIS systems. Thus, the IIS systems cause relatively small changes in the MA and control procedures (Granlund and Malmi, 2002).

6.6 Conclusion

This chapter has presented the qualitative (interview) findings from four case studies focusing on advanced MAP diffusion based on Abrahamson's (1991) framework (section 6.3). Culture perspective which was measured by both qualitative (interviews) and quantitative (drawn on studies of (Reynolds, 1986; Bhimani, 2003; Henri, 2006)) has also included (section 6.4). In section 6.5 supplementary information was presented, which unveils more insights into the interaction effect of MAPs and IISs on organisational performance. The interview aims to give the interviewees the chance to express their views on reasons for or against MAP adoption and reveal linkages between MAPs and IISs. Overall, results could be summarised as follows:

First, based on Abrahamson's (1991) typology, efficient-choice is a dominant reason for management accounting diffusion in Thailand. For example, intensity of market competition and differentiation strategy have been found as influencing advanced MAP adoption. Whilst the advanced MAPs have been rejected because of a "lack of expertise", "uncertainty of the

advanced MAP benefits", economic concerns, and existing system reliability and useful information for management. Other possible reasons for rejection of advanced MAP may be a "lack of autonomy" (forced perspective). The advanced MAP diffusion, in turn, may be changed because of communication of knowledge and economic interests (fad perspective), and learning from textbook and training (fashion perspective).

Second, organisational culture has been found as a significant influencing factor on changes of advanced management accounting system:

- A "lack of top management support" (culture perspective) as an explanation for either diffusion or rejection of advanced MAP has been found.
- The nature of organisation has been found to have a significant association with four dimensions of organisational culture namely external vs. internal emphasis, individual and collective decision-making, simple vs. complex organisation and ignorance vs. knowledge of organisational expectation.
- Organisational positions have an association with three organisational culture dimensions: informal vs. formalised procedures, "hierarchical" and "rational" culture.
- The uses of advanced MAP have been found compatible with four organisational culture elements namely "group", "developmental", "hierarchical" and "rational" culture.

Lastly, IISs support accounting systems in term of data collection, reporting and analysing. Yet, the systems are not intensive implemented and used. Accounting legacy systems do not support IISs. These may be possible explanations for questionnaire findings in chapter five – no significant interaction effects of MAPs and IISs on organisational performance.

The next chapter will present a discussion and summary of the research findings that have emerged from an analysis of the questionnaire and interviews.

Chapter 7. Discussions and Conclusions

7.1 Introduction

This chapter summarises and discusses the research questions, hypotheses tests and interview findings of this study. First, a reiteration of research objectives is presented. The second section begins with a comprehensive overview of MAP changes including the adoption of and the perceived benefits from MAPs, a comparison of those findings with two previous studies Phadoongsitthi (2003) and Nimtrakoon (2009), then follows. Next a section deals with the relationships between contingent factors namely PEU, MCI, organisational strategy, organisational structure, organisational culture, and IIS and MAP adoption. Then, the interaction impacts of MAP adoption and IIS implementation on organisational performance are reported. Interview findings which are explained with the survey analysis are presented. Lastly, contributions, implication, limitations of this study and some suggestions for further research are provided.

7.2 Research Objectives

The study aims to investigate MAPs in Thailand in 2012, supplementing the results with the two earlier studies in order to build up a picture of MAP change in Thai context. Furthermore, this study aims to increasing an understanding of the possible reasons for MAP changes and revealing the underlying contingent factors. Therefore, the major objectives of this study are as follows:

1. Explore the current state of management accounting practices in Thai companies;
2. Identify the reasons and factors which have motivated/prevented the adoption of management accounting practices in Thai companies;
3. Evaluate the impact on organisational performance of the adoption of management accounting practices, integrated information systems and their interaction effect.

To address the objectives above, a contingency theory and a diffusion of innovation theory were employed in order to build a theoretical framework, identifying antecedents influencing MAP adoption and motivation of MAP diffusion (chapter two). A mixed methods approach using a survey and case studies was undertaken to collect data (chapter three). The first phase of data collection used a questionnaire survey (chapter four and five) followed by four case studies using interviews with key personnel to explain motivation/prevention of MAP diffusion (chapter six).

The following section begins with summations of both questionnaire and interview findings including discussions. Next, links between the questionnaire and interview findings are provided. Implication and conclusion then follows. Limitations and future research possibilities are outlined at the end of this chapter.

7.3 Discussion of the Major Survey Findings

The main survey findings with respect of the three objectives of this study will be highlighted as follow:

First, the current state of MAPs in Thailand was investigated based on a comparison with previous studies conducted in 2001 and 2008 (Phadoongsitthi, 2003; Nimtrakoon, 2009).

The following are the key findings of this study:

- The most popular MAPs adopted in Thai companies are
    - Budgeting systems (B) – controlling costs, - planning cash flows, and – coordinating activities across the business unit
    - Product costing (PC) – absorption costing, standard costing and ABC
    - Long-term planning (LTP) – capital budgeting techniques (IRR, NPV and payback period) and formal strategic planning
    - Performance evaluations (PE) – budget variance analysis and BSC
    - Decision support systems (DSS) - product profitability analysis
- Most highly adopted practices are conventional MAPs whereas advanced MAPs are starting to become increasingly adopted.
- Thai companies gain a relatively high level of benefit from every adopted MAPs. Most of them are conventional MAPs.
- However, a few advanced MAPs such as product profitability analysis, ABC, performance evaluations-customer satisfaction survey and BSC are perceived to have increasing benefits.

Conclusions based on comparison with the previous studies:

- Product costing-ABC and performance evaluation-BSC were showing a continued increase in adoption rates.
- The level of perceived benefits from ABC increased from 2001 (ranked 27) to 2008 (ranked 10) but dropped in 2012 (ranked 16).

- The level of perceived benefits from BSC dropped from 2001 (ranked 23) to 2008 (ranked 28) but increased in 2012 (ranked 11).

Additionally, the effects of organisational type and size were investigated, the results are

- Non-manufacturing organisations were high MAP adopters.
- Large organisations had an increased number of MAP adoption.

Without undertaking statistical analysis the findings indicated that the conventional MAPs that are internal to the organisation and which are financially-oriented are predominant. This could be due to two possible reasons. First, it may relate to availability of information, knowledge, and skills and cost-benefit for development of new practices. Second, the main MAPs which were based on cybernetic controls where goals and standards are set, and appropriate corrective actions are taken, or the goals and standards are revised involved in financial data due to stability and tractable technologies (Chenhall and Moers, 2015). The findings are consistent with many countries such as in Australia (Chenhall and Langfield-Smith, 1998a), India (Joshi, 2001), Finland (Hyvönen, 2005) and Turkey (Yalcin, 2012).

Although this study indicated that advanced MAPs adoption are likely low, the adoption rates of ABC and BSC are likely to increase. This finding would suggest that a combination of financial and non-financial information and organisational strategy have initially been emphasised by Thai managers. Any doubts about technical credibility of ABC and BSC may be expelled. Joshi *et al.* (2011) explained BSC usage can imply that organisations are concerned about monitoring and enhancing their performance. Since there are low rates of advanced MAP adoption except for ABC and BSC, organisations may have been considering or were doubtful of the relevance of benefits from them. A lack of awareness of advanced MAPs and prohibitive cost may be other possible reasons why the advanced MAPs have not been widely adopted yet.

The level of perceived benefits from ABC, in turn, were fluctuating against BSC. This finding would imply that Thai managers believed advanced MA information as surveillance function. The economic crisis which had subjected firms to increasing competition and costs resulted in an increased benefits from ABC. Chongruksut (2005) explained that the Thai organisations increased their efficiency of operation and profitability using information from ABC during the economic crisis. Once business environment changes, however, accurate product cost information may be inadequate for determine selling prices, improving decision-making and enhancing organisational performance. Thai managers then observed decreased benefits from

ABC. They may prefer customer satisfaction, part of BSC, as a key performance indicator in order to enhance organisational performance. Bisbe and Malagueño (2012) proposed that strategic performance measurement systems including BSC and comprehensiveness of strategic decision influence organisational performance under dynamic environments. Thus, level of perceived benefits from BSC increased from 2008 to 2012.

Overall, this study is consistent with a study of (Pavlatos and Kostakis, 2015). Budgeting techniques are still commonly used before (2008) and during the (2013) economic crisis in Greece. Organisations turned to advanced MAPs such as ABC during the crisis to gain better quality information – accurate information for cost control and cost management for accurate management decisions.

Additionally, large organisation tend to adopt more MAPs than small ones. Possible reasons may be of the adequacy of resources and facilities in large organisations. The large organisation may also require varieties and sophisticated MAPs to manage complex tasks. Non-manufacturing organisations adopted MAPs more highly than manufacturing ones. The nature of non-manufacturing organisations like service entities may require them to respond to customer needs quicker than manufacturing organisations due to higher intensity of competition. Therefore, MA information may be useful for planning and making decisions under rapid business environmental changes. These support contingency theory that posits organisational size and business type are associated with MAP adoption.

Second, the hypotheses development influencing factors that impact on MAP adoption were reported in chapter two. The binary logistic regression was tested to identify antecedents to MAP changes in chapter five. The statistical test results which identify the relationship between the probability of organisations adopting MAPs and potential variables were as follow:

1. Positive significant results
   - Perceived environmental uncertainty (PEU)
   - Differentiation strategy
   - Integrated Information Systems (IISs)
2. An inconclusive result
   - Intensity of market competition (MCI)

3. Negative significant results
   - Decentralised structure (Organic organisations)
   - Organisational culture – power distance

As a positive significance, the findings indicated that as test variables increase, the probability of an organisation adopting MAPs becomes more likely. It could be a possible explanation for the positive associations between MAP adoption and three variables: PEU, differentiation strategy and IIS. First, managers require an internal information source to monitor and for making decisions when periods of high uncertainty exist. In this case, MA information appears to be endured to stabilising organisational competitive position. These findings are similar to (Chongruksut, 2005; Pavlatos and Kostakis, 2015). Second, product differentiation strategy is a source of differences as to superior quality, product flexibility, customer service, prompt delivery and product design. With the application of the differentiation strategy, accounting' strategic decision making participates and places a greater emphasis on SMA. Therefore organisations which operate under this strategy may place an emphasis on MAPs such as benchmarking, strategic planning techniques and activity-based techniques to gain their competitive advantage as suggested by (Chenhall and Langfield-Smith, 1998b; Cadez and Guilding, 2008; Joiner *et al.*, 2014). Third, adequate resources, including accounting information, may be one of the factors for success in MAP implementation. Equally IIS implementation would help organisations to collect accounting information as a database which may facilitate both MAP implementation and MAP usage. These findings are consistent with previous studies (Baines and Langfield-Smith, 2003; Rom and Rohde, 2006; Chapman and Kihn, 2009), but in contrast with Al-Omiri and Drury (2007)'s findings, which suggest that there was no association between IIS and product costing – ABC in particular – due to no relationship existing between product diversity and quality of information technology.

On the other hand, there is inconclusive evidence in this study to support a significant relationships between MCI and the probability of MAP adoption. The finding is consistent with Hoque and James (2000) and Lee and Yang (2011). A possible reason is that organisations use other tools or techniques instead of MA techniques to enhance their competitiveness when they face high competition in a business market. However, a possible explanation for positive results could be because deregulation of economies and rapid change in business circumstances may cause increasing competition in the market which would lead to a greater use of MAPs by decision makers (Mia and Clarke, 1999).

Lastly, the findings indicate that the probability of MAP adoption tends to decrease when two factors, organic organisations and organisational culture increase. Inconsistent with the expectation, this study found that organic organisations which contain few hierarchical layers, greater decentralisation, few formal rules and a horizontal mode of communication did not give impetus to the probability of MAP adoption. A possible explanation is MA information may not be essential for some employees. Decentralisation provides local managers with discretion in managing their operations; therefore, when problems emerge, managers may prefer to have other solutions or tools for their decisions (Kaplan and Atkinson, 1998, p. 330). This finding is also consistent with (Malmi, 1997; Lee and Yang, 2011) but argue to the contrary (Chenhall, 2008; Tuan Mat and Smith, 2014). As expected a high level of organisational culture (power distance) causes a decrease of probability of MAP adoption. One possible reason is both top managers and local managers in Thailand obey their leaders/a CEO as bureaucratic systems which rely on someone in a higher position. In this respect, the CEO may not place emphasis on MAP usage or may be unaware of the benefits (or highly concerned with cost-benefits) from management accounting information. Therefore, when the CEO does not support MAP adoption the result is that MAPs are not diffused across an organisation. Another possible reason may be a resistance to new systems. If advanced MAPs such as ABC and BSC have been adopted without system modifications, organisations may have been failures at the implementation stage due to resistance against the systems. The level of the resistance may depend on whether or not the systems cause greater empowerment and redistribution of power. This finding is consistent with (Morakul and Wu, 2001; O'Connor *et al.*, 2004; Kittiya and James, 2009; Schäffer *et al.*, 2014).

The findings stated above support the contingency theory (selection fit/congruence fit) belief − no universally appropriate management accounting system exists. This study investigated the impact of influencing factors namely PEU, MCI, differentiation strategy, organic structure, organisational culture and IIS on MAP adoption. Next, the form of contingency theory − the interaction fit is examined.

Third, multiple regression was used to test the interaction of MAP adoption and IIS implementation on organisational performance in chapter five. To address the third objects, there are three steps to hypotheses testing: direct effect between MAP adoption and organisational performance, direct effect between IIS implementation and organisational

performance, and the interaction between MAP adoption and IIS implementation on organisational performance. The following are summary findings:

1. Positive significant results

    *   An association between the number of MAP adoption except PC and firm's financial performance *before* IIS implementation

    *   An association between the number of MAP adoption except B and a firm's non-financial performance *before* IIS implementation

    *   An association between the number of MAP adoption except PC, DSS, and advanced PE and firm's financial performance *after* IIS implementation

    *   An association between the number of MAP adoption except B, DSS, advanced PE and PC and firm's non-financial performance after IIS implementation

    *   An association between the adoption of IIS and a firm's non-financial performance

2. No significant result

    *   Association between the adoption of IIS and a firm's financial performance

    *   The effect of MAPs adoption and IIS implementations on the financial (or non-financial) performance of organisations

Although this study has not found the interaction effect of MAP adoption and IIS implementation on organisational performance (both financial and non-financial performance), the findings indicate that either MAP adoption or IIS implementation enhance the organisational performance. On one hand, the number of MAPs employed influence organisational performance. A possible explanation is organisational participants make use of MA information they receive for controlling, planning and making decision purposes to maximise organisational profits. The accurate and up-to-date MA information may help managers reach informed economic decisions and substantially influence organisational wealth. This finding supports studies of (Schoute, 2009; Macinati and Anessi-Pessina, 2014; Speklé and Verbeeten, 2014; Harlez and Malagueño, 2015). On the other hand, IIS implementation may enhance organisational performance. IIS implementation enables process automation and provides ability to disseminate timely and accurate information which support employee decision-making. It integrates accounting function and management control, for example, general ledger, accounts receivable, accounts payable, financial control, asset manager, profit centres, product cost accounting and performance analysis. Consequently,

there is a real-time information flow from the back office to the front office supporting quick and appropriate decisions. These may improve organisational performance. The findings as predicted confirm studies of (Galy and Sauceda, 2014; Wu and Chen, 2014).

As MAPs were classified into groups using factor analysis (chapter five, table 5.7), there are two main groups. Conventional MAPs consist of budgeting systems, long-term planning and conventional performance evaluation. Another group is advanced MAPs including decision support systems, advanced performance evaluations and product costing. The findings indicate that after IIS was implemented the association between groups of advanced MAPs and organisational performance disappeared. A possible explanation is a lack of training for employees/users. Before IIS is implemented, employees/users in each department know where and how to manage their information effectively. However, after IIS systems were implemented, organisational data was integrated into individual systems (one database). Without proper training, users may not be able to extract data they need due to changes of user interface. Another possible explanation is advanced MAPs in Thailand may be at an early adoption stage. Malmi (2001) suggested that the idea of linking information systems and use of advanced MAP namely BSC was not well understood by the early adopters of BSC systems. This may lead to inadequate information to support advanced MAP usage. This study confirms (Booth *et al.*, 2000) against (Rom and Rohde, 2006; Rom and Rohde, 2007; Kallunki *et al.*, 2011; Maiga *et al.*, 2014).

The interaction effect between MAP adoption and a contingency factor, namely IIS, on organisational performance was traced based on interaction fit or contingency fit. However, only positive direct impacts of either MAPs or IIS on organisational performance have been found in this study.

The following section presents qualitative findings which were conducted in order to achieve the second research objective in this study based on diffusion of innovation theory.

7.4 Discussion of the Major Findings from Case Studies

The following conclusions are of interview findings drawn from diffusion of innovation theory using Abrahamson's (1991) framework with respect to the second objective of this study. Additionally, an organisational culture perspective is highlighted based on studies of Reynolds (1986), Bhimani (2003) and Henri (2006).

A teleological and dialectic explanation of management accounting diffusion may come from either inside organisations (efficient-choice and fad perspectives) or outside organisations

(forced and fashion perspectives). The findings indicate that attributes from the efficient-choice-choice perspective are dominant causes for MAP diffusion across four case studies, followed by fad, fashion and forced perspectives.

Regarding the respondents' point of view, it seems that facilitating factors to the diffusion of advanced MAPs are attributes from efficient-choice perspective: environmental uncertainty, intensity of market competition, organisational strategy, from fad perspective: communication of knowledge and following other lead companies, and from fashion perspective: learning from textbook and training. Interviewees in case organisations would like to close gaps between the organisation's goals and the goals that their organisation can realistically attain. Thus, when business environment changes such as changes of customer requirements, an organisation may change their organisational strategy to gain competitive advantages. Some interviewees claimed to have adopted benchmarking, performance evaluation-customer satisfaction surveys, ABB and BSC due to changes of organisation knowledge and economic interests. Some interviewees were educated about advanced MAPs by being sent to training courses. These findings support (Malmi, 1999) who claims that efficient-choice perspective may be a great explanation for the earliest adoption of advanced MAP, whereas fashion-setting organisations exert considerable influence in the take-off stage. Then, the influence of fashion-setting organisations diminishes. Fad and fashion perspective as explanations for diffusion of management accounting innovation and change were not particularly significant. Modell (2009) argues that fashion perspective was clearly valid in explaining the initial adoption of advanced MAPs; experimenting with organisational learning processes on fashionable management innovations entails important learning aspects. The findings are consistent with a study of Leftesi (2008) which suggested that advanced MAPs have been considered for implementation among Libyan companies because the companies wish to gain a competitive advantage as to other lead companies. The extent of the intensity of competition and changes of organisational factors – differentiation strategy influenced advanced MAP adoption (Al-Omiri and Drury, 2007; Askarany and Yazdifar, 2015).

However, interviewees declared that barriers of diffusion to advanced MAPs are attributes from efficient-choice perspective namely "substitute innovations", "lack of expertise", "uncertainty of benefits from advanced MAPs", "cost-benefits concern", and "reliability of an existing system useful for management" and an attribute from forced perspective which is a "lack of autonomy". Level of bandwagon pressures is a possible explanation which is influenced by level of ambiguity of organisational assessments on innovations' efficiency and returns and competitive pressures. Gosselin (2007) revealed that over 20 years the diffusion

process of ABC had not been as intense as expected due to some confusion about exactly what ABC is and that it is difficult to guarantee an implementation of ABC improves performance and organisational value. A lack of common understanding of ABC systems contributed to a mixed report of ABC adoption rates and impact of ABC on organisational performance (Askarany and Yazdifar, 2012). Similarly, Askarany and Yazdifar (2015) confirmed that barriers to diffusion of advanced MAP, namely benchmarking, were employees who lacked an awareness regarding availability and the uncertainty associated with the outcomes (potential benefits) of advanced MAP adoption. However, the inconsistency of this study's findings with Chiwamit *et al.* (2014) who argue that decision support system-(EVA had a positive association with Thai governing pressures. As the bureaucratic interests in making EVA operational persisted despite the waning of strong political pressures for privatisation after 2006, it was seen as a potentially useful governance mechanism supported by the regulatory framework established through previous reforms (Ibid.).

As regards culture perspective, the findings from organisational culture questionnaires are that:

- The nature of organisations and different organisational positions are associated with perceived work context.
- The use of MAPs are compatible with four organisational culture elements.

Based on studies of Reynolds (1986), Bhimani (2003) and Henri (2006), the findings from this study (chapter six, section 6.4.2) indicated that there are substantive differences on four dimensions: external versus internal emphasis on organisational activities, individual versus collective decision making, simple versus complex organisation, and ignorance versus knowledge of organisational expectations. The major differences of an organisational nature are:

- Company A tended to develop elaborate procedures and structures; most employees know what is going on in the company but according to those interviewed some never figure it out.
- Company B concentrated on external organisational issues.
- Company C, individual members know what they are expected to do and how to complete their organisational tasks.
- Company D emphasised individual decision-making.

Regarding different type of business, each case company has individual nature. Comparisons of other key constructs which provide in chapter six, table 6.5 may supplement the findings above.

- Company A produces home and office products and had a rehabilitation plan resulting from the financial crisis; only half of Board of Directors (BoD) had experience/graduated abroad; the number of main management layers are at least seven layers which highest amongst case companies. The various levels of a hierarchy may imply as high power distance (Hofstede, 2001; House *et al.*, 2004, p. 529). This culture accept commensurate privileges and status. Employees are duty bound to be respectful. Therefore, employees in a lower level might ignore things if their superiors did not ask about them.

- Company B is a technology company; has an American CEO, 58% of BoD are not Thai citizens and more than 90% of BoD had experiences/graduated abroad; at least four main management layers and focus on customer needs. As this company concentrates on external issues, possible reasons are organisational strategy which focus on customer requirements. The company would place emphasis on performance evaluation which relates to customer satisfaction. Moreover, managers who had experiences/graduated abroad could bring international knowledge to this organisation's practices.

- Company C is a resource company providing several learning channels (e.g. Knowledge Management (KM)). Although this company has a Thai CEO, 79% of BoD had experiences/graduated abroad. At least three main management layers and mainly focus on social and environmental friendly strategy. The KM is a possible reason that this company contains individual members who know what they are expected to do and how to complete their organisational tasks. Employees would communicate and learn cross-functional and cross-individual group activities. A fewer number of management layers results in autonomy which is an opportunity for independent thought and action in management positions (House *et al.*, 2004, p. 527).

- Company D is in consumer products – fashion. The company establishes relationships with trading partners to prevent the impact of intense marketing competition, a Thai CEO and BoDs are Thai citizens. More than 60% of BoD had experiences/graduated abroad. Company D employs a mixed differentiation and cost leadership organisational strategy, focusing on customer needs. That the company emphasised

individual decision-making is confirmed by some of interviewees (chapter six, section 6.4.1) – the CEO makes the major decisions and proceeds with implementation.

As positions differ, the evidence showed that different positions (executive officer, senior director and senior manager) were associated with organisational culture in three dimensions: informal vs. formalised procedures, "hierarchical" and "rational" culture. It could be summarised that:

- The higher position (executive officers) tended to involve more verbal discussion even about minor matters than do lower position (senior directors).
- Executive officers believed in bureaucracy, stability, formal delineated roles enforced by rules and regulations than senior directors but less than senior managers.
- Senior directors focused more than senior managers on achievement and the meritocracy-based belief that competent performance and achievement of designated organisational objectives are to be rewarded.

Regarding the competing value model (chapter two, section 2.7.3), the relationships between organisational culture and use of MAPs by top management teams was examined. Bhimani (2003) indicated that different users' organisational culture elements affected their perception of the success of the newly implemented MA system. Similarly, Henri (2006) suggested that top managers of organisations reflecting a flexibility dominant type tend to use more advanced MAPs than top managers of organisations reflecting a control dominant type. As findings from organisational culture questionnaire in chapter six reveal, it seems that different employee groups (accounting managers and non-accounting managers) can subscribe to different organisational values that reflect on the success of design and use of MAPs.

- Company B which were reflecting flexibility dominant type (flexible to dynamic change) tended to have a group of non-accounting managers who use more MAPs to focus organisational attention and support strategic decision-making than do accounting managers.
- Company A and D, in turn, was reflecting control dominant type which included hierarchical culture, individual's action, motivation and emphasis on individual achievement. Accounting managers in company A tended to use and perceive benefits from MAPs less than non-accounting managers.

- Company C which was partially reflecting control dominant type tended to have accounting managers who place less emphasis on MAP usages than non-accounting managers.

These findings imply that organisations may be encouraged to define their expected use of MAPs before implementing particular MAPs as a guidance toward the diversity of MAPs in their organisations. The implementation of MAPs in company B and D with a group of non-accounting managers may have a greater chance of success than the implementation in company A due to the managers' perception about MAP adoption.

Overall, the findings suggested that the nature of organisations like company B which are external focused and have an emphasis on individual decision-making seem to implement advanced MAPs more successfully with non-accounting managers. Possible explanations are company B is only one case organisation whose CEO nationality is USA and more than 50% of people on the board of directors are not Thai citizens (chapter six, table 6.5). These may be explained by studies of (Firth, 1996) and (Wu *et al.*, 2007) who proposed that the state-owned enterprises (SOEs) that had Joint Ventures (JV) with foreign partners tended to have higher diffusion indices than did their non-JV partner (USA and Europe versus others) due to the diffusion of accounting ideas from foreign enterprises to local organisations. Wu and Boateng (2010) argue that level of knowledge of senior managers was influencing changes in MAPs. However, in company D some interviewees mentioned that employees seem to rely on a CEO who tends to reject advanced MAPs (chapter six, section 6.4.1). It could imply, in organisation D which emphasised individual decision-making, if CEO proposes the use of advanced MAPs, those practices tend to be successfully diffused in the organisation. Similarly, top management support seems to be a significant factor influencing advanced MAP adoption (Liu and Pan, 2007; Lee *et al.*, 2014; Morelli and Lecci, 2014). Additionally, it can be seen that managers at both levels in organisation C perceived equally benefits from and use of advanced MAPs. Therefore, advanced MAPs tend to be diffused across the organisation as suggested by (Malmi, 1997; Henri, 2006).

The findings above confirm the diffusion of innovation theory which suggests that diffusion of innovation is communicated/participated/shared information through channels. As typology of change in MA based on Sulaiman and Mitchell's (2005) study, this study concerned only two types of change: addition and replacement due to the objective to identify the reasons for adoption or non-adoption of MAP in Thai companies.

The following section presents significant findings linking questionnaires and interviews.

7.5 Discussion of the Major Findings of Survey and Case Studies

The following conclusions present linkages between questionnaire and interview findings regarding objectives of this study.

The evidence from this study are:

- MAPs in Thailand tend to have little change.
- The MAP changes observed are affected by both exogenous factors (environmental uncertainty and intensity of market competition) and endogenous factors (differentiation strategy, organic structure, organisational culture and integrated information systems)
- MAPs and IIS cause a direct impact on organisational performance but there is no evidence of an interaction effect of them on organisational performance.

The evidence of conventional MAPs which focus on financial orientation remains dominant in Thailand. Thai managers may believe that the conventional MAPs provide enough management accounting information for their companies. Advanced MAPs might also have less perceived benefits than it should. Therefore, the managers will not seek new practices.

However, there is a sign of increased advanced MAP adoption namely ABC and BSC, as evident in survey results. Diffusion of additional advanced MAPs such as ABB and benchmarking was also indicated by case organisations. These findings place the level of diffusion of advanced MAPs in Thailand similar to those experienced in other developing countries in Gulf Cooperation Council Countries and Turkey, but higher than India (see Appendix S). Such similarity demonstrates that there are clearly varying levels of attributions from those aforementioned endogenous and exogenous factors, which may be worthy of further investigation (see no. 5 in section 7.8).

The findings clearly point out possible root causes of MAP changes as stated in section 7.3 and 7.4. Organisations tend to place a significant role on MA information when employing differentiation strategy and implementing IIS in order to close gaps between organisational goals and standards. As the importance of competitiveness, the influence of market competition intensity and increased environmental uncertainty were recognised, most Thai organisations focused on innovation technology and developing strategies instead of advanced MA information to a gain competitive advantage. However, when business environment changes organisations may reject advanced MAPs and remain conventional ones due to developing organisational knowledge that efficiently close performance gaps. Moreover,

organisational culture was not designed to support the requirements for innovations in effective ways. It is apparent that Thai management style is high power distance, preferring stability and believing in hierarchical order. The advanced MAPs will be implemented successfully and use the efficiency and effectives of top managers of organisations which are associated with affiliation, flexibility, readiness and emphasised on human resource development. If organisational culture is the cause of MAP adoption, this study could clarify absence of advanced MAPs adoption in Thai organisations.

Lastly, the questionnaire findings indicated that IIS implementation enhances organisational performance. Interviewees revealed that IIS systems support the use of MAPs in areas of data collection, reporting and analysing. Consequently, the interaction of MAPs and IISs should enhance organisational performance. Yet, interviewees declared that the IISs that they have has been using are not intensive and accounting legacy systems do not support IISs. This evidence therefore explains the causes of the lack of an interaction effect between MAP adoption and IIS implementation on organisational performance.

Research objectives, research questions and the conclusions from the findings are illustrated in table 7.1. Then, the next section presents contributions that this study has made to knowledge in management accounting and information technology fields in the context of Thailand and other developing countries.

Table 7. 1: Summary of Research Objectives, Research Questions and Findings

Research Objectives	Research Questions	Summary of Survey's Findings	Summary of Case Study's Findings
1. To explore the current state of adoptions and perceived benefits from MAPs in Thai companies	1.1 Which MAPs are commonly used in Thai companies? (comparisons between this study, conducted in 2012, and previous studies conducted in 2001 and 2008) *(section 7.3)*	• Most highly adopted practices are conventional MAPs whereas advanced MAPs are increasingly adopted *(section 4.3.1)*	
	1.2 What is the extent of the degree of perceived benefits from the adoption of MAPs? (comparisons between this study, conducted in 2012, and previous studies conducted in 2001 and 2008) *(section 7.3)*	• Thai companies gain a relatively high level of benefit from every adopted MAPs. Most of them are conventional MAPs. • Advanced MAPs – BSC is perceived to have increasing benefits whereas ABC is slightly perceived to have decreasing benefits. *(section 4.3.2)*	
2. To identify the reasons and factors which have enabled/prevented the adoptions of MAPs in Thai companies	2.1 What are the factors influencing/impeding MAP adoptions in Thai companies? *(section 7.3)*	• *Some findings supported H1:* the higher level of perceived environmental uncertainty (PEU) the probability of firms adopting MAPs including budgeting systems (B), product costing (PC), decision support systems (DSS) and performance evaluations (PE) is higher than that of firms facing low PEU • *Inconclusive results for H2:* firms under high intensity of market competition (MCI) are more/less likely to adopt MAPs whereas there is no impact of MCI on the adoption of product costing.	

Research Objectives	Research Questions	Summary of Survey's Findings	Summary of Case Study's Findings
		• *Some findings supported H3:* Firms adopting a differentiation strategy will more likely adopt MAPs except PE than firms not adopting this strategy. • *Some findings rejected H4:* organic firms have a lesser probability of MAP adoption including B, DSS and PE than mechanistic firms. • *Findings supported H5:* The more power distance in organisations lead to less probability of MAP adoptions. • *Findings supported H6:* Firms implemented IISs are more likely to adopt MAPs *(section 5.4)*	
	2.2 Why organisations adopt/not adopt management accounting practices? *(section 7.4)*		• Conventional MAPs are dominant in Thai context because managers believe that conventional MAPs provide enough management accounting information for their companies. • Advanced MAPs might have less perceived benefits than desired. Therefore, the advanced MAPs have a low adoption rate. • Most interview findings support survey results. Moreover, interview findings provided further explanation for the survey results which were inconclusive and for which there was no evidence.

Research Objectives	Research Questions	Summary of Survey's Findings	Summary of Case Study's Findings
			For example, – Although a high intensity of market competition may increase demands for management accounting information, some managers focus more on the marketing perspective instead. • Organisational culture is one of root cause of MAP diffusion. *(Chapter 6)*
3. To evaluate the impact on organisational performance of adoption of MAPs, IISs and their interaction effect	3.1 What are the interaction effects of MAP adoptions and IIS implementations on organisational financial performance? *(section 7.3)* 3.1.1 What are the impacts of MAP adoptions on financial performance of organisations?	• *Some findings supported H7:* there is a positive association between the number of MAP adoptions except PC and firm's financial performance *before* IIS implementation *(section 5.5.2)* • *Some findings supported H9:* there is a positive association between the number of MAP adoptions except PC, DSS, and advanced PE and firm's financial performance *after* IIS implementation *(section 5.5.3)*	

Research Objectives	Research Questions	Summary of Survey's Findings	Summary of Case Study's Findings
	3.1.2 What are the impacts of IIS implementations on financial performance of organisations?	• *No findings supported H11:* there is no association between the adoption of IIS and a firm's financial performance	
	3.1.3 What are the combination effects of MAP adoptions and IIS implementations on financial performance of organisations?	• *No findings supported H13:* there is no evidence supporting the effect of MAPs adoptions and IIS implementations on the financial performance of organisations	
	3.2 What are the interaction effect of MAP adoptions and IIS implementations on organisational non-financial performance? *(section 7.3)*		
	3.2.1 What are the impacts of MAP adoptions on non-financial performance of organisations?	• *Some findings supported H8:* there is a positive association between the number of MAP adoption except B and a firm's non-financial performance *before* IIS implementation *(section 5.5.2)* • *Some findings supported H10:* there is a positive association between the number of MAP adoptions except B, DSS, advanced PE and PC and firm's non-financial performance *after* IIS implementation *(section 5.5.3)*	

Research Objectives	Research Questions	Summary of Survey's Findings	Summary of Case Study's Findings
	3.2.2 What are the impacts of IIS implementations on non-financial performance of organisations?	• *Findings supported H12:* there is a positive association between the adoption of IIS and a firm's non-financial performance *(section 5.5.3)*	
	3.2.3 What are the combination effects of MAP adoptions and IIS implementations on non-financial performance of organisations?	• *No findings supported H14:* there is no evidence supporting the effect of MAPs adoptions and IIS implementations on the non-financial performance of organisations	• IISs such as Oracle and SAP, which have been implemented in case companies, facilitate MAP usage in the area of data collection but do not support reporting and analysis. • The systems are not intensive implemented and used in a few case companies. Therefore, there is no interaction effect between IISs and MAPs on organisational performance. *(Chapter 6)*

7.6 Contributions of the Research

Given the aforementioned reasons, it is worthwhile conducting an empirical study on MAP changes covering periods of rapid changes in the business environment in order to shed light on MAP development in the unique cultural setting of Thailand also filling in the gap of interaction effects of MAPs and IIS on organisational performance. The contingency framework and diffusion theory are used to investigate the underlying factors that influence Thai companies' choices on certain types of MAPs and consequential interaction effects of IISs implementation and MAPs on organisational performance.

1. Although this study repeated two previous studies conducted in Thailand (Phadoongsitthi, 2003; Nimtrakoon, 2009), additional MAPs were investigated and a comparison made between this study and those two prior studies. No previous research has exclusively addressed a comparison between the use of and the perceived benefits from MAPs in Thailand.

2. Most previous studies examine the adoption of and the perceived benefits from MAPs in two categories: conventional- and advanced MAPs. Whist this study adopted broad ranges of MAPs conducted by (Chenhall and Langfield-Smith, 1998a; Joshi, 2001; Hyvönen, 2005; Angelakis *et al.*, 2010). MAPs were divided into five categories: budgeting systems, decision support systems, product costing, long-term planning and performance evaluations.

3. It seems there is no existing study in the literature conducted using contingency theory to investigate the relationship between contingent factors and those five MAP categories.

4. Selected contingent factors employed in this study are not a new endeavour. An organisational culture was measured by a combination of three main perspectives: power distance (Pratt and Beaulieu, 1992; Hofstede, 2001), organisational culture dimensions (Reynolds, 1986) and competing values model (Bhimani, 2003; Henri, 2006). These may provide the first critical measurements of organisational culture in line with contingency theory.

5. There has not been much research on the interaction effects of MAP adoption and IIS implementations on organisational performance particularly organisational non-financial performance. This study investigated not only the combination between MAP adoption and IIS implementations impact on organisational performance including financial- and non-financial performance. Moreover, each group of MAP adoption: budgeting systems , decision support systems, product costing, long-term planning and performance evaluations was taken into account.

7.7 Implications for Practice

The study shows one of the major antecedents to MA change is organisational culture. Top managers tend to lack awareness or uncertainty about yield benefits of advanced MAPs to organisations. As a result, the advanced MAPs are still in an early stage of implementation. Moreover, the controlling dominant type of culture which includes hierarchical culture causes employees to obey managers in higher positions. It is difficult to adopt or implement any innovation without a suggestion from top managers. As a consequence, providing advanced MAPs know-how to top managers, CEOs in particular, would facilitate MAP adoption. Given the benefits from MAPs, organisational performance could then be enhanced. This implication is an unmet need for Thai state-owned enterprises. The suggestion may not be appropriate for joint-venture organisations.

As suggested by Rom and Rohde (2006), IIS systems namely Enterprise Resource Planning (ERP) enhance management accounting tasks for data collection. IISs-Strategic Enterprise Management (SEM) systems have supported reporting and analysis. Consequently, those linkages between MAPs and IIS systems might impact on organisational performance (Rom and Rohde, 2007). However, the evidence indicates no such impact of a combination between MAP adoption and IIS implementation on organisational performance. Only a direct impact of either MAP or IIS on organisational performance has been found. Implementation success of the MA system is not associated with IIS systems. The highlight here is for making a decision on new systems investment. It may not be worth the cost for organisations to invest in synergic systems. These should just suggest to organisations in considering implementing either IIS or advanced MA systems.

Tucker and Lowe (2014) suggested that professional accounting bodies would demonstrate the mutual value to both academics and practitioners lead to a closer engagement between MA academic researchers and practitioners. As professional body of management accountants - CIMA is narrowly interested by supply side. Thai students may focus on academic pathways (Bachelors, Masters, PhD) rather than the professional pathways such as CIMA qualifications. MA development is still rather new in Thailand. Consequently, employers have no active MA knowledge which are benefits of having CIMA. CIMA provides academic journals, conferences and training programmes for practitioners. If these were available in Thailand, there may be a much broader awareness of MA development.

The validity and reliability of the study were of concern. Therefore, measures were emphasised and put in place during the research design stage, the data collection and analysis

phase. Despite these efforts, this study still has limitations which are outlined in the next section.

7.8 Limitations and Future Research

This study has fulfilled its objectives. Like any other study, however, it is subject to a number of limitations which may as a consequence present opportunities for future research. Some specific limitations of this study are follows:

1. This study is only representative of the population of the SET. Financial organisations were excluded from the sample. Therefore, the findings would not generalise to financial organisations listed on SET and other organisations that have not been listed on the SET. Future research could extend this study to small and medium size organisations which are not listed on the SET as well as to other countries.

2. The limitations of an online questionnaire which was employed by this study may lead to a sizeable response failure and thus low response rates. Follow-up techniques were applied to avoid the disadvantages of the online survey (chapter three, section 3.6.1)

3. An ambiguity of terminology may affect the results as this study as it relied on a translation between English and Thai languages. Expressions and practices could be misinterpreted or misunderstood particularly those which may not have received much visibility in Thailand. The translation processes (back-translation approach), however, were carefully followed along with multi-frequencies consulting (chapter three, section 3.6.1). The multilingual glossary (Appendix E) was provided to avoid or reduce any potential ambiguity related to management accounting terminologies.

4. This study employed a contingency theory approach to understand the relationship between five attributes of MAPs (i.e. budgeting system, long-term planning, product costing, decision support systems and performance evaluations) and six contingent factors (i.e. environmental uncertainty, the intensity of market competition, organisational strategy, organisational structure, organisational culture, integrated information system). Future research could increase the number of contingent variables to investigate wider associations between the contingent factors and the adoption of MAPs.

5. This study used two forms of fit congruence and contingency (Gerdin and Greve, 2004) to investigate the direct effect of selected contingent variables on MAP adoption and to examine the interaction effect of MAP adoption and IIS implementation on organisational performance using multiple regression analysis. Although, no combination effect was found, there are some sign of an association between MAP adoption and IIS

implementation (Table 5.9). This gives opportunities for future studies to investigate this issue using advanced statistical analysis such as structure equation modelling.

6. A self-rating scale[51] which was used in this study could be criticised in terms of objective, reliability and validity (Abernethy and Guthrie, 1994). The concept of multidimensionality has reduced those disadvantages of the self-rating scale particularly in the management accounting field (Lee and Yang, 2011; Fayard *et al.*, 2012; Maiga *et al.*, 2014).

7. This study has limits on identification of organisational performance and isolation from other aspects. Organisational performance (financial and non-financial) was understood in this study as the degree of respondent's perception of success along several dimensions adapted from previous studies (i.e. Bisbe and Otley (2004), Hyvönen (2007) and Hoque (2011)). Due to an ethical issue, this study did not force respondents to identify their company's name on a questionnaire, therefore some returned questionnaires were anonymous. Thus, these limitations could be minimised by conducting a different sort of study. For example, market-based reaction to accounting choices.

8. This study focused on whether contingent factors impact MAP adoption, while a typology of MA changes of (Sulaiman and Mitchell, 2005) namely replacement, output modification and operational modification was beyond the scope of this study. Future research would consider the impact of contingent factors, organisational culture in particular on a simple typology of management accounting change (i.e. addition, replacement, output modification, operational modification and reduction).

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[51] This study has employed a five-point Likert Scale.

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Appendices

Appendix A: A Comparison of Lists of MAPs in Different Studies

	Phadoo ngsitthi (2003)[a]	Nimtra koon and Tayles (2010)[b]	Angelakis *et al.* (2010)[c]	Hyvönen (2005)[d]	Abdel Al and McLellan (2013)[e]	Joshi (2001)[f]	Chenhall and Langfield-Smith (1998)[g]	This study	
								Categories	Functions **
Absorption costing	C	C	C				C	C	PC
ABB						A	A	A	B
ABC	A	A	A	A	A	A	A	A	PC
ABM		A	A	A			A	A	DS
BSC separately from performance evaluation								A	DS
Benchmarking - carried out within the wider organisation	A		A	A		A	A	A	DS
Benchmarking - management process	A	A	A	A	A		A	A	DS
Benchmarking - operational process	A	A	A	A	A	A	A	A	DS
Benchmarking - product/service	A	A	A	A	A	A	A	A	DS

characteristics	Phadoongsitthi (2003)[a]	Nimtrakoon and Tayles (2010)[b]	Angelakis *et al.* (2010)[c]	Hyvönen (2005)[d]	Abdel Al and McLellan (2013)[e]	Joshi (2001)[f]	Chenhall and Langfield-Smith (1998)[g]	This study Categories	This study Functions **
Benchmarking - strategic priorities	A	A		A	A		A	A	DS
Benchmarking - with outside organisations	A		A	A			A	A	DS
Budgeting systems - compensating managers		C	C				C	C	B
Budgeting systems - controlling costs		C	C	C	C		C	C	B
Budgeting systems - coordinating activities across the business unit	C	C	C				C	C	B
Budgeting systems - evaluating managers' performance			C				C	C	B
Budgeting systems - planning cash flows	C	C	C	C	C		C	C	B
Budgeting systems - planning day-to-day operations		C	C	C	C		C	C	B

	Phadoo ngsitthi (2003)[a]	Nimtra koon and Tayles (2010)[b]	Angelakis *et al.* (2010)[c]	Hyvönen (2005)[d]	Abdel Al and McLellan (2013)[e]	Joshi (2001)[f]	Chenhall and Langfield-Smith (1998)[g]	This study	
								Categories	Functions **
Budgeting systems - planning financial position			C	C	C		C	C	B
Capital budgeting techniques - IRR	C	C	C		C		C	C	LTP
Capital budgeting techniques - NPV	C	C	C		C		C	C	LTP
Capital budgeting techniques - Payback period	C	C	C		C		C	C	LTP
Cost modelling								A	PC
Cost of quality		A						A	PC
CVP	C	C	C				C	C	DS
CPA								A	DS
EVA		A	A					A	DS
Formal strategic planning	A	C	C			A	C	C*	LTP
JIT	A			A			A	A	DS
Kaizen costing	A	A						A	PC
Long range forecasting	C	C	C				C	A	LTP
Operations research techniques	A	A	A					A	DS

	Phadoongsitthi (2003)[a]	Nimtrakoon and Tayles (2010)[b]	Angelakis *et al*. (2010)[c]	Hyvönen (2005)[d]	Abdel Al and McLellan (2013)[e]	Joshi (2001)[f]	Chenhall and Langfield-Smith (1998)[g]	This study	
								Categories	Functions **
Performance evaluation - BSC	A	A	A	A			A	A	PE
Performance evaluation - budget variance analysis	C	C	C		C		C	C	PE
Performance evaluation -CFROI	C	C	C					C	PE
Performance evaluation - controllable profit	C	C	C		C		C	C	PE
Performance evaluation - customer satisfaction surveys	A	A	A	A	A			A	PE
Performance evaluation - divisional profit	C	C	C	C			C	C	PE
Performance evaluation - employee attitudes		A	A	A	A		A	A	PE
Performance evaluation - non-financial measures	A		A					A	PE
Performance evaluation - ongoing supplier evaluations		A	A		A			A	PE

	Phadoongsitthi (2003)[a]	Nimtrakoon and Tayles (2010)[b]	Angelakis et al. (2010)[c]	Hyvönen (2005)[d]	Abdel Al and McLellan (2013)[e]	Joshi (2001)[f]	Chenhall and Langfield-Smith (1998)[g]	This study Categories	This study Functions **
Performance evaluation - production processes			A					A	PE
Performance evaluation - qualitative measures			A			A		A	PE
Performance evaluation - residual income (e.g. interest adjusted profit)		C	C				C	C	PE
Performance evaluation - return (profit) on investment	C	C	C	C	C		C	C	PE
Performance evaluation - team performance	A	A	A	A	A		A	A	PE
Product life cycle analysis	A	A	A	A	A		A	A	DS
Product profitability analysis	A	A	A		A			A	DS
SVA	A	A	A	A			A	A	DS
Standard costing	C	C						C	PC
Strategic plans developed separately from budgets			C	C			C	C	LTP

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	Phadoongsitthi (2003)[a]	Nimtrakoon and Tayles (2010)[b]	Angelakis et al. (2010)[c]	Hyvönen (2005)[d]	Abdel Al and McLellan (2013)[e]	Joshi (2001)[f]	Chenhall and Langfield-Smith (1998)[g]	This study Categories	This study Functions **
Strategic plans developed with budgets			C	C			C	C	LTP
Target costing	A	A	A	A			A	A	PC
Throughput accounting		A						A	PC
TQM	A			A			A	A	DS
Value chain analysis	A	A	A	A		A	A	A	DS
Variable costing		C	C	C			C	C	PC
Zero-based budgeting						A		A	B

Note:
1. [a] conducted in Thailand (collected data in 2001), [b] conducted in Thailand (collected data in 2008), [c] conducted in Greece, [d] conduced in Finland, [e] conducted in Egypt, [f] conducted in India and [g] conducted in Australia.
2. C = "conventional", A = advanced
3. [*] called "conventional" based on recent studies e.g. Nimtrakoon and Tayles (2010) and Angelakis et al. (2010).
4. [**] Based on studies of Chenhall (1998a) and Angelakis et al. (2010); LTP = Long term planning, B = Budgeting systems, PC = Product costing, PE = Performance evaluation, DS = Decision support systems

Appendix B: A Comparative View of Demographic Data between the Three Studies Conducted in Thailand

Year of conducting	2002[a]	2008[b]	2012[c]
Collected data period	2001	2008	2012
Industry types (number of responses received):			
Agro and Food Industry	11	16	18
Consumer Products	11	8	9
Financial	-	15	13[**]
Industrials	16	21	25
Property and Construction	10	32	15
Resources	3	7	5
Services	8	24	15
Technology	4	12	11
Companies under rehabilitation*	7	N/A	Excluded
Totals	70	135	98
Number of listed companies on SET	317	451	350[***]

[*] A company which distress from financial crisis operates under debt restructuring.

[**]Thirteen financial companies were excluded from this study

[***] There are 350 companies which agreed to complete the questionnaire, out of 460 companies in total

[a] Phadoongsitthi (2003), [b] Nimtrakoon (2009), [c] this study

Appendix C: Questionnaires cover letter

Subject: PhD Research as to Management Accounting Development, Integrated Information Systems, and their Joint Impact on Firm Performance: Evidence from Thailand

Dear: Chief Financial Officer/Accounting manager,

This survey is conducted under the aegis of the Newcastle University (UK) business school as part of the requirements for my Doctor of Philosophy degree. The main objectives are; (1) to reveal the extent to which practitioners are advancing knowledge in management accounting practices (MAPs), also Integrated Information Systems (IISs) such as Enterprise Resource Planning (ERP), by Thai businesses (2) to examine relationships between MAPs and IISs adoption and (3) to evaluate the impacts of adoption of MAPs and IISs on firms' performance.

The questionnaire is 11 pages long and should take about 20 minutes for you to complete. There is absolutely no risk to participants as this study is solely for academic purposes and all participation is strictly voluntary. No one's identity will be disclosed. Only aggregate results of voluntary responses will be recorded and reported. To achieve the objective of this study, a small number of chief financial officers or accounting managers will be interviewed in person. Regardless of the extent of your involvement, your completion of the questionnaire is absolutely necessary to assure an acceptable response rate for valid results.

Please answer the questions during the next one to two week period and return the completed questionnaire as soon as practicable. To avoid redundant and unnecessary follow up with non-respondents please provide your company's name on the last page. In addition, if you would like to receive an executive summary of this study once the work is complete; please provide your email address on the last page also. This study will provide one of the first accounts of IISs and MAPs development in Thailand.

If you have any questions or concerns regarding this study please feel free to contact me at one of the email addresses or office addresses provided below.

As I stated the success of this study depends on your participation. Therefore, your contribution to this effort will be greatly appreciated.

Yours truly,
Nuatip Sumkaew, Ph.D. Candidate

	Office Address in Thailand:
	(available from 1-30 April 2012 inclusive)
Ph.D. Candidate in Accounting	Faculty of Management and Information
Newcastle University Business School	Sciences
Newcastle University	Naresuan University
5 Barrack Road,	99/9 T. Thapo, A. Muang
Newcastle upon Tyne	Phitsanulok, 65000, Thailand
NE1 4SE, United Kingdom	Tel: 055962098
Tel. +44 (0) 191 208 1600	Fax: 055962097
Email:N.Sumkaew@newcastle.ac.uk	Email: Nuatips@nu.ac.th

Appendix D: Questionnaires for data collection

MANAGEMENT ACCOUNTING AND INTEGRATED INFORMATION SYSTEMS

QUESTIONNAIRE

To be answered by a Chief Financial Officer or Other accounting staff

Please complete this questionnaire by selecting or writing in the appropriate boxes for the appropriate answers. (Select one only)

Section 1 Organisational and personal backgrounds

Part 1.1 Personal Background

1. Position:

    ☐ Chief Financial Officer (CFO)　　☐ Assistant Accounting
    　　　　　　　　　　　　　　　　　　　Supervisor

    ☐ Accounting Manager　　　　　　　☐ Accountant

    ☐ Assistant Accounting Manager　　☐ Assistant Accountant

    ☐ Accounting Supervisor　　　　　 ☐ Other (Please specify)
    　　　　　　　　　　　　　　　　　　　……

2. How long have you served in this position? :

    ☐ Less than 1 year　　　　　　　　☐ 6 – 10 year

    ☐ 1 – 5 year　　　　　　　　　　　☐ More than 10 years

3. How long have you worked for this organisation? :

    ☐ Less than 1 year　　　　　　　　☐ 6 – 10 year

    ☐ 1 – 5 year　　　　　　　　　　　☐ More than 10 years

4. Highest level of education :

    ☐ PhD or equivalent　　　　　　　☐ Post Graduate Diploma

    ☐ Master Degree　　　　　　　　　☐ Other (Please specify)
    　　　　　　　　　　　　　　　　　　　……

    ☐ Bachelor Degree

5. Have you studied in an accounting field? :

    ☐ Yes　　　　　　　　　　　　　　☐ No (Go to Q#7)

6. Which of the following qualifications do you hold? (select more than one answer):

☐ A certificated public accountant (CPA)   ☐ Other (Please specify)

                                                    ……

☐ A certificated internal auditor (CIA)   ☐ No

7. Have you ever had education or training abroad?? :

☐ Yes   ☐ No (Go to Q#9)

8. [Q9] In which country or countries have you been educated or trained?:

☐ A European country   ☐ An Asian country

☐ An American country   ☐ Other (Please specify)

                                                    ……

Part 1.2 Organisational Background in Thailand (Please select one only)

9. Business Type :

☐ Agro and Food Industry Food and Beverage   ☐ Property and Construction Property Development

☐ Agro and Food Industry Agribusiness   ☐ Property and Construction Property Fund

☐ Consumer Products Fashion   ☐ Property and Construction Construction Materials

☐ Consumer Products Home and Office Products   ☐ Resources Energy and Utilities

☐ Consumer Products Personal Products and Pharmaceuticals   ☐ Resources Mining

☐ Financials Banking   ☐ Services Commerce

☐ Financials Finance and Securities   ☐ Services Health Care Services

☐ Financials Insurance   ☐ Services Media and Publishing

☐ Industrials Automotive   ☐ Services Professional Services

☐ Industrials Packaging   ☐ Services Tourism and Leisure

☐ Industrials Paper and Printing Materials   ☐ Services Transportation and Logistics

☐ Industrials Petrochemicals   ☐ Technology Electronic Components

and Chemicals

☐ Industrials Industrial   ☐ Technology Information

     Materials and Machinery   and Communication Technology

☐ Industrials Steel   ☐ Other (Please specify) ……

10. Nationality of organization:

     ☐ Thai state-owned   ☐ American-owned

     ☐ Japanese-owned   ☐ Other (Please specify) ……

     ☐ British-owned

11. Nationality of Chief Executive Officer (CEO):

     ☐ Thai state-owned   ☐ American-owned

     ☐ Japanese-owned   ☐ Other (Please specify) ……

     ☐ British-owned

12. Average total assets located in Thailand in 2012 (Million Baht):

     ☐ Less than 1,000   ☐ 15,001 – 25,000

     ☐ 1,000 – 5,000   ☐ Over 25,000

     ☐ 5,001 – 15,000

13. The number of company employees in company located in Thailand in 2012:

     ☐ Less than 250   ☐ 1,251 – 2,500

     ☐ 251 - 750   ☐ Over 2,500

     ☐ 751 – 1,250

14. Net sales in 2011 (Million Baht):

     ☐ Less than 1,000   ☐ 10,001 – 50,000

     ☐ 1,000 – 5,000   ☐ Over 50,000

     ☐ 5,001 – 10,000

Section 2 Management Accounting Practices (MAPs) diffusion in your organisation

15. Please indicate the degree of perceived satisfaction from the MAPs that your organisation relies upon based on a scale of 1 (Extremely Dissatisfied) to 5 (Extremely Satisfied) (Please leave MAPs which are not be used blank)

Management accounting practices (MAPs) (see glossary for interpretation)	The degree of perceived satisfaction from using MAPs				
	Extremely *Dissatisfied*				**Extremely** **Satisfied**
	1	2	3	4	5
1. Absorption costing	☐	☐	☐	☐	☐
2. Activity-based budgeting (ABB)	☐	☐	☐	☐	☐
3. Activity-based costing (ABC)	☐	☐	☐	☐	☐
4. Activity-based management (ABM)	☐	☐	☐	☐	☐
5. Balance Scorecard (BSC) separately from performance evaluation	☐	☐	☐	☐	☐
6. Benchmarking - product/service characteristics	☐	☐	☐	☐	☐
7. Benchmarking – operational processes	☐	☐	☐	☐	☐
8. Benchmarking – management processes	☐	☐	☐	☐	☐
9. Benchmarking - strategic priorities	☐	☐	☐	☐	☐
10. Benchmarking – carried out within the wider organisation	☐	☐	☐	☐	☐
11. Benchmarking – with outside organisations	☐	☐	☐	☐	☐
12. Budgeting systems – compensating managers	☐	☐	☐	☐	☐
13. Budgeting systems - controlling costs	☐	☐	☐	☐	☐
14. Budgeting systems - coordinating activities across the business unit	☐	☐	☐	☐	☐
15. Budgeting systems – panning day-to-day operations	☐	☐	☐	☐	☐
16. Budgeting systems - planning cash flows	☐	☐	☐	☐	☐

17. Budgeting systems – evaluating managers' performance	☐	☐	☐	☐	☐
18. Budgeting systems – planning financial position	☐	☐	☐	☐	☐
19. Capital budgeting techniques - Net present value (NPV)	☐	☐	☐	☐	☐
20. Capital budgeting techniques - Internal rate of return (IRR)	☐	☐	☐	☐	☐
21. Capital budgeting techniques - Payback period	☐	☐	☐	☐	☐
22. Cost modelling	☐	☐	☐	☐	☐
23. Cost of quality	☐	☐	☐	☐	☐
24. Cost-volume-profit analysis (CVP)	☐	☐	☐	☐	☐
25. Customer profitability analysis (CPA)	☐	☐	☐	☐	☐
26. Economic value added (EVA)	☐	☐	☐	☐	☐
27. Formal strategic planning	☐	☐	☐	☐	☐
28. Just-in-Time Costing (JIT)	☐	☐	☐	☐	☐
29. Kaizen costing	☐	☐	☐	☐	☐
30. Long range forecasting	☐	☐	☐	☐	☐
31. Operations research techniques	☐	☐	☐	☐	☐
32. Performance evaluation based on – balanced scorecard (BSC)	☐	☐	☐	☐	☐
33. Performance evaluation based on – return (profit) on investment	☐	☐	☐	☐	☐
34. Performance evaluation based on – customer satisfaction surveys	☐	☐	☐	☐	☐
35. Performance evaluation based on – budget variance analysis	☐	☐	☐	☐	☐
36. Performance evaluation based on – cash flow return on investment (CFROI)	☐	☐	☐	☐	☐
37. Performance evaluation based on – controllable profit	☐	☐	☐	☐	☐
38. Performance evaluation based on – team performance	☐	☐	☐	☐	☐

39. Performance evaluation based on - divisional profit	☐	☐	☐	☐	☐
40. Performance evaluation based on – employee attitude	☐	☐	☐	☐	☐
41. Performance evaluation based on – non-financial measures	☐	☐	☐	☐	☐
42. Performance evaluation based on – ongoing supplier evaluations	☐	☐	☐	☐	☐
43. Performance evaluation based on – production processes	☐	☐	☐	☐	☐
44. Performance evaluation based on – qualitative measures	☐	☐	☐	☐	☐
45. Performance evaluation based on – residual income (e.g. interest adjusted profit)	☐	☐	☐	☐	☐
46. Product cycle analysis	☐	☐	☐	☐	☐
47. Product profitability analysis	☐	☐	☐	☐	☐
48. Shareholder value added (SVA)	☐	☐	☐	☐	☐
49. Standard costing	☐	☐	☐	☐	☐
50. Strategic plans developed separately from budgets	☐	☐	☐	☐	☐
51. Strategic plans developed with budgets	☐	☐	☐	☐	☐
52. Target costing	☐	☐	☐	☐	☐
53. Throughput accounting	☐	☐	☐	☐	☐
54. Total Quality Management (TQM)	☐	☐	☐	☐	☐
55. Value chain analysis	☐	☐	☐	☐	☐
56. Variable costing	☐	☐	☐	☐	☐
57. Zero-based budgeting	☐	☐	☐	☐	☐

Section 3 Organisational Structure and Organisational Culture

16. Description of organisational structure is provided below. To what extent is your organisational structure? Please select the best description of your organisation based on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree)

Organisations	Extent to what is your organisational structure				
	Strongly _Disagree_				**Strongly Agree**
	1	2	3	4	5
1. Your company has a clear organisation structure, standard rules and policies	☐	☐	☐	☐	☐
2. Every employee knows company rules in formal way e.g. letter or internal email	☐	☐	☐	☐	☐
3. Employees can make suggestions to their bosses or colleagues in order to improve at work	☐	☐	☐	☐	☐
4. Employees can share opinions with their boss who involves them with decision making	☐	☐	☐	☐	☐
5. Staffs and managers in your company are be able to work cross-function teams	☐	☐	☐	☐	☐
6. Department goals are set by employees in and out of departments	☐	☐	☐	☐	☐
7. Your company shares or exchanges resources and information across departments	☐	☐	☐	☐	☐
8. There are more than six organisational layers between operating staff and CEO	☐	☐	☐	☐	☐
9. There are few layers on your organisational chart	☐	☐	☐	☐	☐
10. There are many authority levels and a hierarchical order	☐	☐	☐	☐	☐
11. Middle managers or supervisors are usually supportive their staff's work team	☐	☐	☐	☐	☐
12. Most employees in your company prefer working at a routine more than at challenging assignments	☐	☐	☐	☐	☐
13. Formal written communication is preferred more than	☐	☐	☐	☐	☐

Organisations	Extent to what is your organisational structure				
	Strongly *Disagree*				Strongly Agree
	1	2	3	4	5
face-to-face or telephone communication					
14. Seminars and sharing opinion meetings are set up often in order to share idea between operation employees and different levels of managers	☐	☐	☐	☐	☐
15. Every decision needs to be approved by head of organisation	☐	☐	☐	☐	☐
16. Every manager has authority to approve any issues under their business unit	☐	☐	☐	☐	☐

Section 4 Organisational Strategy

17. Description of organisational strategy is provided below. Which of the following descriptions most fits your organisation? Please select the best describe strategies used in your organisation based on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree)

Organisational Strategy	Extent to what is your organisational strategy				
	Strongly *Disagree*				Strongly Agree
	1	2	3	4	5
1. Your organisation is (1) Operating in a stable environment with a more limited range of products and/or services than your competitors, (2) Offering high quality and lower prices, (3) A small percentage of the forefront of adopting new products/services.	☐	☐	☐	☐	☐
2. Your organisation is (1) More diversifies in products and/or service than competitors, (2) Always 'first in' in new products and/or services even if not all highly profitable, (3) Seeking to support customer needs	☐	☐	☐	☐	☐

Organisational Strategy	Extent to what is your organisational strategy				
	Strongly _Disagree_				Strongly Agree
	1	2	3	4	5
3. Your organisation is (1) Operating in a stable market base providing a limited range of products and/or services But, (2) Focusing on research and development (R&D) in competitive areas, (3) Frequently be 'second in' with more cost-efficient	☐	☐	☐	☐	☐
4. Your company is (1) Maintaining established products and/or services as same as competitors But (2) Responds to competitive market when it forced	☐	☐	☐	☐	☐
5. Your organisation is (1) Broadening of products/services market scope, (2) Rapid customisation products/services response to customer's needs	☐	☐	☐	☐	☐
6. Your organisation is (1) The low-cost leader, (2) Making products/services more Cost-efficient	☐	☐	☐	☐	☐

Section 5 Perceived Environmental Uncertainty (PEU) and Intensity of Market Competition

18. Please indicate a change to the following environment in your company caused by the factors shown on a scale of 1 (Not change) to 5 (Sudden change)

Business Environment	Extent to how is your organisation affected				
	Not Change				Sudden Change
	1	2	3	4	5
1. Product and Service Development and Innovation investment	☐	☐	☐	☐	☐
2. Customer requirements	☐	☐	☐	☐	☐
3. Competitors' action	☐	☐	☐	☐	☐
4. Market share	☐	☐	☐	☐	☐
5. Political and economic influences surrounding your company	☐	☐	☐	☐	☐

19. Please evaluate the degree of intensity of competition using on a scale of 1 (Not Competitive) to 5 (High Competitive) or N/A if the items are not applicable in your company as follows:

Market Competition	Intensity of Competition			
	2008	2010	2012	Next 3 years
1. Competitive Environment: Raw materials, parts and Equipment				
2. Competitive Environment: Products and/or Services Development				
3. Competitive Environment: Customer requirements				
4. Competitive Environment: Price competition				
5. Competitive Environment: Distribution channels and market Share				

Section 6 To study the impact of Integrated Information Systems (IISs) on MAPs

20. Has your organisation been using any software? (You may select more than once in the completion of this section)

☐	ACCPAC	☐	Express	☐	Navigator
☐	Attain	☐	Formula or Forma	☐	MAC 4
☐	AutoFlight	☐	Great Plains	☐	PeopleSoft
☐	Microsoft Dynamic AX/Axaptar	☐	Happy Soft	☐	QuickBooks
☐	BAAN/JD Edwards	☐	Hyperion	☐	Sage
☐	EasyAcc	☐	IBM-Cognos	☐	SAP R/3
☐	Oracle Application	☐	In-house	☐	WinSpeed
☐	Other (Please specify) ……				
☐	No (Please specify) ……				

21. Have people from accounting department been part of any software application implementations?

☐ Yes   ☐ No

22. Has your organisation been using spreadsheet (e.g. Microsoft Excel) in your accounting processes?

☐ Yes   ☐ No

23. Do software applications help in practices? Please explain Why or Why NOT? Your responses are entirely confidential

………………………………………………………………………………………………

………………………………………………………………………………………………

Section 7 Performance Measurement

Base on financial and nonfinancial performance measurement used by your organisation BEFORE and AFTER software applications in Q#20 are implemented:

24. Please rank the degree of perceived benefit from organisational performance measurement below (1 is 'Not at all important' to 5 as 'Very important')

Organisational Performance	The degree of perceived benefits **BEFORE** software are implemented				
	Not at all important			Very important	
	1	2	3	4	5
1. Return on Investment (ROI)	☐	☐	☐	☐	☐
2. Return on Assets (ROA)	☐	☐	☐	☐	☐
3. Sales growth rate	☐	☐	☐	☐	☐
4. Cash flow from operations	☐	☐	☐	☐	☐
5. Controlling cost	☐	☐	☐	☐	☐
6. Customer Satisfaction	☐	☐	☐	☐	☐
7. Market Share	☐	☐	☐	☐	☐
8. Number of warranty claims or customer complaints	☐	☐	☐	☐	☐
9. Number of new product launches	☐	☐	☐	☐	☐
10. Number of employee taking education or training	☐	☐	☐	☐	☐
11. Other (please specify)…………………………………	☐	☐	☐	☐	☐

25. When software applications are implemented, how would you describe the degree of perceive benefit in each measurement based on a scale 1 (High Decrease) to 5 (High Increase)

Organisational Performance	The degree of perceived benefits **AFTER** software are implemented				
	Not at all important			Very important	
	1	2	3	4	5
12. Return on Investment (ROI)	☐	☐	☐	☐	☐
13. Return on Assets (ROA)	☐	☐	☐	☐	☐
14. Sales growth rate	☐	☐	☐	☐	☐
15. Cash flow from operations	☐	☐	☐	☐	☐
16. Controlling cost	☐	☐	☐	☐	☐
17. Customer Satisfaction	☐	☐	☐	☐	☐
18. Market Share	☐	☐	☐	☐	☐
19. Number of warranty claims or customer complaints	☐	☐	☐	☐	☐
20. Number of new product launches	☐	☐	☐	☐	☐
21. Number of employee taking education or training	☐	☐	☐	☐	☐
22. Other (please specify)…………………………………	☐	☐	☐	☐	☐

26. Would you be possible to further discuss any issues raised by this questionnaire? (Optional)

☐ Meeting possible (please provide email address and telephone number) ☐ Meeting NOT possible

E-mail: …………..

Telephone no.:   ……………..

27. Would you like to receive an executive summary when this study is completed? (Optional)

    ☐ Yes (please provide email address)   ☐ No

    E-mail: …………..

28. Would you mind telling me your company's name? (Optional)

    Organisation/Company Name: ……………..

---Thank you for your cooperation---

Appendix E: Glossary of Management Accounting Practice Terms

Absorption costing Stock costing method in which all variable manufacturing costs and all fixed manufacturing costs are included as inventoriable costs

Activity-based budgeting Approach to budgeting that focuses on the costs of activities necessary to produce and sell products and services

Activity-based costing Approach to costing that focus on activities as the fundamental cost objects It uses the cost of these activities as the basis for assigning costs to other cost objects such as products, services or customers

Activity-based management Management system which uses activity-based costing information to improve profits and enhance value to customers

Balanced scorecard A measurement and management system that views a business unit's performance from four perspectives: financial, customer, internal business process, and learning and growth

Benchmarking The continuous process of measuring products, services or activities against the best levels of performance

Budgeting systems The quantitative expression of a plan of action and an aid to the coordination and implementation of the plan

Capital budgeting The process of making long-term planning decisions for investments

Net present value Discount cash-flow method that calculates the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time, using the requires rate of return

International rate of return Discount rate at which the present value of expected cash inflows from a project equals the present value of expected cash outflows of the project. The IRR is the discount rate that makes net present value equal to zero. Also called *the time-adjusted rate of return*

Payback period Measures the time it will take to recoup, in the form of net cash inflows, the net initial investment in a project

Cost modelling Method of constructing and implementing cost models to improve profitability. Cost models give a clear view of the unit cost and profitability of products/services, support a better understanding of the organisation's main cost drivers, and foster evolution towards a margin-driven business

Cost of quality Costs incurred to prevent or rectify the production of a low-quality product

Cost-volume-profit analysis Examines the behaviour of total revenues, total costs and operating profit as changes occur in the output level, selling price, variable costs or fixed costs; a single revenue driver and a single cost driver are used in this analysis

Customer profitability analysis Examines how individual customers or groupings of customers, differ in their profitability

Economic value added A residual income measure calculating the amount of income generated by the company or its divisions in excess of stockholders' and long term creditors' expectations

Just-in-Time costing A standard costing system that starts with output completed and then assigns manufacturing costs to units sold and to inventories.

Kaizen costing Making improvements by frequent small amounts rather than having major changes at longer intervals. The aim in kaizen costing is to reduce variable costs below the cost level in the base period. It is based on nothing ever perfect so it will always be some way of making a small improvement.

Product life cycle Spans the time from initial R&D to the time at which support to customers is withdrawn

Product profitability analysis Analysis of the revenue streams and costs associated with specific products or product groups

Residual income Income minus a required monetary return on the investment or operating profit less an interest charge based on assets used and controlled by the division

Return on Investment Accounting measure on income divided by an accounting measure on investment. Also called *accounting rate of return (ARR)* It is calculated by taking profit controllable by the division as a percentage of the investment in assets which produces that profit

Shareholder value added Total return to the shareholders in terms of both dividends and share price growth, calculated as the present value of future free cash flows of the business discounted at the weighted average cost of the capital of the business less the market value of its debt

Standard costing Costing method that traces direct costs to a cost object by multiplying the standard price(s) or rate(s) times the standard inputs allowed for actual outputs achieved and allocates indirect costs on the basis of the standard indirect rate(s) times the standard inputs allowed for the actual outputs achieved

Strategic planning Involves preparing, evaluating and selecting strategies to achieve objectives of a long-term plan of action

Target cost Product cost estimate derived by subtracting a desired profit margin from a competitive market price

Throughput accounting Stock costing method that treats all costs except those related to variable direct materials as costs of the accounting period in which they are incurred; only variable direct materials costs are inventoriable also called *super variable costing*

Total Quality Management A philosophy of delight customer by providing them with superior products and services requires improving quality and eliminating defects and waste throughout the value chain

Value chain analysis The sequence of business functions in which utility (usefulness) is added to the products or services of an organisation

Variable costing Stock costing method in which all variable manufacturing costs are included as inventoriable costs. All fixed manufacturing costs are excluded from inventoriable costs; they are costs of the period in which they are incurred. All called *direct costing*.

Variance costing Difference between an actual result and a budgeted amount when that budgeted amount is a financial variable reported by the accounting system

Zero-based budgeting Budgeting from the ground up, as though the budget were being prepared for the first time. Every proposed expenditure comes under review

Appendix F: Interviews Cover Letter

Dear Sir/Mam

I am a final year PhD candidate under the aegis of the Newcastle University (UK) business school. My research topic is entitled "management accounting development, integrated information systems, and their impact on firm performance". The objectives of my research are as follows:

1. to examine the interconnection between the advancement of management accounting practices and the adoption of integrated information systems such as Enterprise Resource Planning (ERP)
2. to examine their impact on organisational performance.

Empirical evidence so far has been in the context of Western countries but very little in the context of Thailand. I therefore hope to investigate any unique evidence from Thai companies. The empirical aspect of my research requires undertaking interviews with key personnel of organisations. Duration of one interview session is no more than one-hour. The main interview questions are:

1. Why have you adopted your current management accounting practices?
2. How do you envisage any changes to your current MAPs? Why?
3. Why integrated information systems have (not) been changed?
4. How the changes affect organisation's performance?

I will very grateful if you could give me a time that is convenient to you. I am currently in Thailand to collect research data until 23rd September 2013. So please contact me at one of the email addresses or mobile phone provided below. In return, I will send you a report of my findings.

Your prompt reply will be very much appreciated.

Sincerely yours,

Nuatip Sumakew

PhD candidate in Accounting

Newcastle University Business School

United Kingdom

E-mail: n.sumkaew@newcastle.ac.uk; nuatips@nu.ac.th

Mobile: (66) 88 281 4268

Appendix G: Interviews Questions

Part One:

A) Background information

1) Would you please give me a brief summary of your career history? (i.e. working experiences, position held, period in)

2) Would you please give me detail of the nature of your work now?

3) What is your business goal? If so, what are key success factors?

4) Do you find the management accounting information (in management report or other forms) useful? If so, how? If not, why?

5) Are you able to use Integrated Information systems (IISs) (i.e. SAP, Oracle etc.) to get the information you want yourself or ask your accounting manager(s) to do that? If yes, can you give some examples? If not, why?

6) Do you think that you need additional information to assist your day-to-day jobs for making decisions, planning and control? Why?

B) Management Accounting Practices (MAPs)

1) To what extent are MAPs such as cash flow, budgeting systems, benchmarking, balance scorecard, and activity-based costing used in your organisation?

2) Do you have changed or will be changed MAPs such as budgeting systems, benchmarking, product costing, and performance evaluation? How? And why?

3) To what extent the use of non-financial techniques such as balanced scorecard, benchmarking, target costing and activity-based costing are more emphasis in the future?

C) Integrated Information Systems (IISs) *(a CFO and a head of IT department only)*

1) Has your organisation implemented ERP systems or in-house software? Why?

2) What are purposes of implanting ERP systems above?

3) Have people who have accounting background/knowledge been part of the ERP systems implantations?

4) Has your organisation been using Microsoft Excel in *accounting process*? If so, the process can be replaced with ERP systems?

5) Do you have changed or will be changed IIS systems as above? How? And Why?

6) Have the changes affect organisational performance?

7) Please indicate the degree of perceived benefits from the same systems above (from 1 = extremely dissatisfied to 5 = extremely satisfied)

D) Synergy between MAPs and IISs

    1) How do you find the use of IISs have affected your MAPs so far?

    2) Do you think there are between IISs and management accounting; their association impact on organisational performance?

    3) Why did you choose these MAPs? (for decision making, performance evaluation on departments and managers (for their bonuses), and planning (e.g. pricing))

    4) Why did you or did you not choose to implement IISs?

Appendix H: Organisational culture questionnaire

<u>Part Two: organisational Culture</u>

To understand your organisational culture, could you please circle one number on the following questions?

1. At work ...(select one number)

    1) Major emphasis is on meeting outside demands of customers, clients, or whatever.

    2) Most emphasis is on meeting outside demands; some attention is given to organisation routines.

    3) There is a balanced emphasis: outsiders' demands and organisational routines get equal attention.

    4) Most emphasis is on organisational routines; some is given to clients, customers, etc.

    5) Major emphasis is on organisational routines; paperwork, meetings, rules, procedures, and the like.

2. At work ...(select one number)

    1) Fulfilling organisational task is the only priority.

    2) Fulfilling organisational task is the priority; some attention is given to people's social and personal needs.

    3) There is a balanced focus: organisational task and social/personal needs get equal attention.

    4) Social/personal needs get the priority; some is given to conduct the organisational task.

    5) The only priority is on fulfilling social and personal needs.

3. At work ....(select one number)

   1) No risk of any kind is ever taken.

   2) There is a willingness to accept a minimal risk.

   3) Familiar and predictable risks are acceptable.

   4) There is some acceptance of unfamiliar risk.

   5) Any kind of risk is readily accepted.

4. At work ...(select one number)

   1) No variation in clothing, work styles, and personal activities within and away from the job site.

   2) No variation in clothing, work styles, and personal activities only within the job site.

   3) There is a willingness to accept some variation in clothing, work styles, and personal activities.

   4) Only some limitation variation in clothing and work- style within the job site.

   5) No limitation of clothing, work styles, and personal activities.

5. At work ...(select one number)

   1) Organisation provides rewards (job continuity, systematic rises and prestige status) only based on individual's performance.

   2) Organisation provides rewards based on individual performance; some rewards are given to all members of a work unit (a team that meets a sales, production, or research goal).

   3) There is a balanced rewarding emphasis: individual and the work unit get fair share of the rewards.

   4) Most rewards may be distributed to the work unit based on it's work performance; some rewards are given to individual based on his/her contributions to the performance.

   5) All of the rewards are associated with work unit's performance.

6. At work ...(select one number)

   1) Key individuals make the major decisions and proceed with implementation.

   2) Key individuals make the major decisions but not proceed with implementation.

   3) Decisions are collected from various levels of individuals (difference background, different department and mixture of different level in the hierarchy of organisation).

   4) Decisions are collected from various levels of individuals; other individuals are responsible for implementation.

5) Decisions are collected from various levels of individuals and the same group of individuals is responsible for implementation.

7. At work ....(select one number)

   1) Headquarters makes all decisions on the programmes and actions of the organisation and local situation.

   2) Headquarters makes some decisions; some decisions are remained with local offices/departments to decide about their own situation.

   3) Headquarters and local offices jointly make decisions on the programmes and actions of the organisation and local situation.

   4) Local offices/departments make decisions on most of local situation; some still remain with the headquarters.

   5) Local offices/departments make all decisions.

8. At work ....(select one number)

   1) No planning takes place only ad hoc responses to all changes.

   2) Ad hoc responses are useful to some of the changes; minimal effort to anticipate and plan for change.

   3) A balanced effort is put into: ad hoc responses to unforeseeable changes and some anticipation and plans developed for change.

   4) Minimal use of ad hoc responses to changes.

   5) Organisation creates elaborate plans that anticipate most future scenarios.

9. At work ...(select one number)

   1) A reluctance to adopt any new procedure that is not well established.

   2) Precaution is given to any new procedure that is not well established; a search effort is given to reduce the uncertain.

   3) A willingness to adopt any new procedure as long as well recommended by others and pilot tested.

   4) Some efforts are put to find new procedures.

   5) A constant search for novel and distinctive goods, services, and procedures to changes.

10. At work...(select one number)

   1) Anybody can quickly learn the company and the people.

   2) It takes about a year to learn the company and get to know the people.

   3) After a year or two, most people seem to know what is going on, but some never figure it out.

4) Only a few people seem to understand the company and the politics - and it takes them a long time.

5) Nobody seems to fully understand both the company and internal politics.

11. At work ....(select one number)

1) No formal, extensive and detailed rules and procedures and elaborate forms and written document to justify any and all actions.

2) Verbal discussions and approval on major issues, little or no discussion regarding minor matters.

3) Verbal discussions, some written documents and approval on major issues, verbal discussions on minor matters.

4) Verbal discussions, some written documents and approval on both major issues and minor matters.

5) Extensive and detailed rules and procedures and elaborate forms and written documents to justify all actions.

12. At work ...(select one number)

1) The interests of organisation are most important.

2) The interests of organisation are important; some of personal interests (family, professional colleagues, personal career) are also need to be considered.

3) The interests of organisation and personal are equally important and need to be considered in a balance.

4) Personal interests are important; the interests of organisation also need to be considered.

5) Only personal interests are most important.

13. At work ....(select one number)

1) Individual members pay no attention on that they are expected to do and how their work will contribute to the accomplishment of organisational tasks

2) Individual members do not know what they are expected to do and how their work will contribute to the accomplishment of organisational tasks

3) Individual members have some ideas about what they are expected to do and but do not know how their work will contribute to the accomplishment of organisational tasks

4) Individual members know about what they are expected to do and have some ideas about how their work will contribute to the accomplishment of organizational tasks

5) Individual members know what they are expected to do and how their work will contribute to the accomplishment for organisational tasks

14. At work ...(select one number)

1) Anybody can be a manager in this workplace.

2) A person who has professional knowledge but no managerial skills can be a manager.

3) A person who has managerial skills but no professional knowledge can be a manager.

4) A person who has both professional knowledge and managerial skills can be a manager.

5) A managerial person needs to be fully competent in terms of professional knowledge, managerial skills, and other qualities (prestige status in the workplace, loyalty to the organisation, etc.)

15. Please selecting the following statement:

1) In order to get scarce rewards (salary increases, bonuses and promotion), individual members enter into fierce competition among each other.

☐	☐	☐	☐	☐
Entirely true	True	Sometimes true	False	False entirely

2) When competing with outsiders (other units in the corporation, other businesses, government agencies, and the like), individual members trust colleagues because they can assist to each other very well.

☐	☐	☐	☐	☐
Entirely true	True	Sometimes true	False	False entirely

16. Please distribute 100 points among the four descriptions (based on the describing which is similar to your department, please use all 100 points)

For example, if department A seems to describe your department, department B is somewhat similarity whereas department C and D are not describing your department at all. Thus, you may give department A 70 points and 30 points to department B.

1) Department Character (Please distribute 100 points)

_____ Department A is a very personal place. It is a lot like an extended family. People seem to share a lot of themselves.

_____ Department B is a very dynamic and entrepreneurial place. People are willing to stick their necks out

_____ Department C is a very formalized and structured place. Bureaucratic procedures generally govern what people do.

_____ Department D is very production-oriented. A major concern is with getting the job done. People are not very personally involved.

2) Department Leader (Please distribute 100 points)

_____ The head of Department A is generally considered to be a mentor, a sage, or a father or mother figure.

_____ The head of Department B is generally considered to be an entrepreneur, an innovator, or a risk taker.

_____ The head of Department C is generally considered to be a coordinator, an organiser, or an administrator.

_____ The head of Department D is generally considered to be a producer, a technician, or a hard driver.

3) Department ''Glue'' (Please distribute 100 points)

_____ The glue that holds Department A together is loyalty and tradition. Commitment to this institution runs high.

_____ The glue that holds Department B together is commitment to innovation and development. There is an emphasis on being first.

_____ The glue that holds Department C together is formal rules and policies. Maintaining a smooth running operation is important here.

_____ The glue that holds Department D together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.

4) Department Emphases (Please distribute 100 points)

_____ Department A emphasises human resources. High cohesion and morale in the institution are important.

_____ Department B emphasises growth and acquiring new resources. Readiness to meet new challenges is important.

_____ Department C emphasises performance and stability. Efficient, smooth operations are important.

_____ Department D emphasises competitive action and achievement. Measurable goals are important.

----Thank you for your cooperation-----

Appendix I: Budgeting System Adoption and Types of Industry

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Budgeting systems - controlling costs	Not Adopted	Count	7	2	13	3	1	8	2	36
		% within Industrial Type	38.9%	22.2%	52.0%	20.0%	20.0%	53.3%	18.2%	36.7%
		% of Total	7.1%	2.0%	13.3%	3.1%	1.0%	8.2%	2.0%	36.7%
	Adopted	Count	11	7	12	12	4	7	9	62
		% within Industrial Type	61.1%	77.8%	48.0%	80.0%	80.0%	46.7%	81.8%	63.3%
		% of Total	11.2%	7.1%	12.2%	12.2%	4.1%	7.1%	9.2%	63.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Budgeting systems - planning cash flows	Not Adopted	Count	10	4	15	5	1	9	4	48
		% within Industrial Type	55.6%	44.4%	60.0%	33.3%	20.0%	60.0%	36.4%	49.0%
		% of Total	10.2%	4.1%	15.3%	5.1%	1.0%	9.2%	4.1%	49.0%
	Adopted	Count	8	5	10	10	4	6	7	50
		% within Industrial Type	44.4%	55.6%	40.0%	66.7%	80.0%	40.0%	63.6%	51.0%
		% of Total	8.2%	5.1%	10.2%	10.2%	4.1%	6.1%	7.1%	51.0%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Budgeting systems - compensating managers	Not Adopted	Count	14	8	20	8	4	12	4	70
		% within Industrial Type	77.8%	88.9%	80.0%	53.3%	80.0%	80.0%	36.4%	71.4%
		% of Total	14.3%	8.2%	20.4%	8.2%	4.1%	12.2%	4.1%	71.4%
	Adopted	Count	4	1	5	7	1	3	7	28
		% within Industrial Type	22.2%	11.1%	20.0%	46.7%	20.0%	20.0%	63.6%	28.6%
		% of Total	4.1%	1.0%	5.1%	7.1%	1.0%	3.1%	7.1%	28.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Budgeting systems - coordinating activities across the business unit	Not Adopted	Count	11	6	19	7	1	10	8	62
		% within Industrial Type	61.1%	66.7%	76.0%	46.7%	20.0%	66.7%	72.7%	63.3%
		% of Total	11.2%	6.1%	19.4%	7.1%	1.0%	10.2%	8.2%	63.3%
	Adopted	Count	7	3	6	8	4	5	3	36
		% within Industrial Type	38.9%	33.3%	24.0%	53.3%	80.0%	33.3%	27.3%	36.7%
		% of Total	7.1%	3.1%	6.1%	8.2%	4.1%	5.1%	3.1%	36.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Budgeting systems - planning day-to-day operations	Not Adopted	Count	15	7	21	8	4	10	7	72
		% within Industrial Type	83.3%	77.8%	84.0%	53.3%	80.0%	66.7%	63.6%	73.5%
		% of Total	15.3%	7.1%	21.4%	8.2%	4.1%	10.2%	7.1%	73.5%
	Adopted	Count	3	2	4	7	1	5	4	26
		% within Industrial Type	16.7%	22.2%	16.0%	46.7%	20.0%	33.3%	36.4%	26.5%
		% of Total	3.1%	2.0%	4.1%	7.1%	1.0%	5.1%	4.1%	26.5%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
ABB	Not Adopted	Count	16	8	23	12	5	11	3	78
		% within Industrial Type	88.9%	88.9%	92.0%	80.0%	100.0%	73.3%	27.3%	79.6%
		% of Total	16.3%	8.2%	23.5%	12.2%	5.1%	11.2%	3.1%	79.6%
	Adopted	Count	2	1	2	3	0	4	8	20
		% within Industrial Type	11.1%	11.1%	8.0%	20.0%	0.0%	26.7%	72.7%	20.4%
		% of Total	2.0%	1.0%	2.0%	3.1%	0.0%	4.1%	8.2%	20.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Budgeting systems - planning financial position	Not Adopted	Count	17	7	22	11	3	11	7	78
		% within Industrial Type	94.4%	77.8%	88.0%	73.3%	60.0%	73.3%	63.6%	79.6%
		% of Total	17.3%	7.1%	22.4%	11.2%	3.1%	11.2%	7.1%	79.6%
	Adopted	Count	1	2	3	4	2	4	4	20
		% within Industrial Type	5.6%	22.2%	12.0%	26.7%	40.0%	26.7%	36.4%	20.4%
		% of Total	1.0%	2.0%	3.1%	4.1%	2.0%	4.1%	4.1%	20.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Budgeting systems - evaluating managers' performance	Not Adopted	Count	16	7	21	11	4	10	5	74
		% within Industrial Type	88.9%	77.8%	84.0%	73.3%	80.0%	66.7%	45.5%	75.5%
		% of Total	16.3%	7.1%	21.4%	11.2%	4.1%	10.2%	5.1%	75.5%
	Adopted	Count	2	2	4	4	1	5	6	24
		% within Industrial Type	11.1%	22.2%	16.0%	26.7%	20.0%	33.3%	54.5%	24.5%
		% of Total	2.0%	2.0%	4.1%	4.1%	1.0%	5.1%	6.1%	24.5%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Zero-based budgeting	Not Adopted	Count	15	8	24	11	4	9	7	78
		% within Industrial Type	83.3%	88.9%	96.0%	73.3%	80.0%	60.0%	63.6%	79.6%
		% of Total	15.3%	8.2%	24.5%	11.2%	4.1%	9.2%	7.1%	79.6%
	Adopted	Count	3	1	1	4	1	6	4	20
		% within Industrial Type	16.7%	11.1%	4.0%	26.7%	20.0%	40.0%	36.4%	20.4%
		% of Total	3.1%	1.0%	1.0%	4.1%	1.0%	6.1%	4.1%	20.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

Appendix J: Decision Support Systems Adoption and Types of Industry

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Product profitability analysis	Not Adopted	Count	12	7	16	10	2	10	8	65
		% within Industrial Type	66.7%	77.8%	64.0%	66.7%	40.0%	66.7%	72.7%	66.3%
		% of Total	12.2%	7.1%	16.3%	10.2%	2.0%	10.2%	8.2%	66.3%
	Adopted	Count	6	2	9	5	3	5	3	33
		% within Industrial Type	33.3%	22.2%	36.0%	33.3%	60.0%	33.3%	27.3%	33.7%
		% of Total	6.1%	2.0%	9.2%	5.1%	3.1%	5.1%	3.1%	33.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
TQM	Not Adopted	Count	13	7	17	9	2	8	8	64
		% within Industrial Type	72.2%	77.8%	68.0%	60.0%	40.0%	53.3%	72.7%	65.3%
		% of Total	13.3%	7.1%	17.3%	9.2%	2.0%	8.2%	8.2%	65.3%
	Adopted	Count	5	2	8	6	3	7	3	34
		% within Industrial Type	27.8%	22.2%	32.0%	40.0%	60.0%	46.7%	27.3%	34.7%
		% of Total	5.1%	2.0%	8.2%	6.1%	3.1%	7.1%	3.1%	34.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Benchmarking - product/service characteristics	Not Adopted	Count	15	7	18	9	1	11	8	69
		% within Industrial Type	83.3%	77.8%	72.0%	60.0%	20.0%	73.3%	72.7%	70.4%
		% of Total	15.3%	7.1%	18.4%	9.2%	1.0%	11.2%	8.2%	70.4%
	Adopted	Count	3	2	7	6	4	4	3	29
		% within Industrial Type	16.7%	22.2%	28.0%	40.0%	80.0%	26.7%	27.3%	29.6%
		% of Total	3.1%	2.0%	7.1%	6.1%	4.1%	4.1%	3.1%	29.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
CPA	Not Adopted	Count	15	8	17	11	4	11	6	72
		% within Industrial Type	83.3%	88.9%	68.0%	73.3%	80.0%	73.3%	54.5%	73.5%
		% of Total	15.3%	8.2%	17.3%	11.2%	4.1%	11.2%	6.1%	73.5%
	Adopted	Count	3	1	8	4	1	4	5	26
		% within Industrial Type	16.7%	11.1%	32.0%	26.7%	20.0%	26.7%	45.5%	26.5%
		% of Total	3.1%	1.0%	8.2%	4.1%	1.0%	4.1%	5.1%	26.5%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
CVP	Not Adopted	Count	14	8	18	7	2	10	7	66
		% within Industrial Type	77.8%	88.9%	72.0%	46.7%	40.0%	66.7%	63.6%	67.3%
		% of Total	14.3%	8.2%	18.4%	7.1%	2.0%	10.2%	7.1%	67.3%
	Adopted	Count	4	1	7	8	3	5	4	32
		% within Industrial Type	22.2%	11.1%	28.0%	53.3%	60.0%	33.3%	36.4%	32.7%
		% of Total	4.1%	1.0%	7.1%	8.2%	3.1%	5.1%	4.1%	32.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
BSC separately from performance evaluation	Not Ado pted	Count	16	7	21	12	3	10	6	75
		% within Industrial Type	88.9%	77.8%	84.0%	80.0%	60.0%	66.7%	54.5%	76.5%
		% of Total	16.3%	7.1%	21.4%	12.2%	3.1%	10.2%	6.1%	76.5%
	Ado pted	Count	2	2	4	3	2	5	5	23
		% within Industrial Type	11.1%	22.2%	16.0%	20.0%	40.0%	33.3%	45.5%	23.5%
		% of Total	2.0%	2.0%	4.1%	3.1%	2.0%	5.1%	5.1%	23.5%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Benchmarking - strategic priorities	Not Adopted	Count	14	7	18	9	4	12	6	70
		% within Industrial Type	77.8%	77.8%	72.0%	60.0%	80.0%	80.0%	54.5%	71.4%
		% of Total	14.3%	7.1%	18.4%	9.2%	4.1%	12.2%	6.1%	71.4%
	Adopted	Count	4	2	7	6	1	3	5	28
		% within Industrial Type	22.2%	22.2%	28.0%	40.0%	20.0%	20.0%	45.5%	28.6%
		% of Total	4.1%	2.0%	7.1%	6.1%	1.0%	3.1%	5.1%	28.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Benchmarking - management process	Not Adopted	Count	17	7	20	9	4	12	8	77
		% within Industrial Type	94.4%	77.8%	80.0%	60.0%	80.0%	80.0%	72.7%	78.6%
		% of Total	17.3%	7.1%	20.4%	9.2%	4.1%	12.2%	8.2%	78.6%
	Adopted	Count	1	2	5	6	1	3	3	21
		% within Industrial Type	5.6%	22.2%	20.0%	40.0%	20.0%	20.0%	27.3%	21.4%
		% of Total	1.0%	2.0%	5.1%	6.1%	1.0%	3.1%	3.1%	21.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Benchmarking - operational process	Not Adopted	Count	15	7	18	9	4	12	4	69
		% within Industrial Type	83.3%	77.8%	72.0%	60.0%	80.0%	80.0%	36.4%	70.4%
		% of Total	15.3%	7.1%	18.4%	9.2%	4.1%	12.2%	4.1%	70.4%
	Adopted	Count	3	2	7	6	1	3	7	29
		% within Industrial Type	16.7%	22.2%	28.0%	40.0%	20.0%	20.0%	63.6%	29.6%
		% of Total	3.1%	2.0%	7.1%	6.1%	1.0%	3.1%	7.1%	29.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Benchmarking - carried out within the wider organization	Not Adopted	Count	18	7	24	12	4	12	7	84
		% within Industrial Type	100.0%	77.8%	96.0%	80.0%	80.0%	80.0%	63.6%	85.7%
		% of Total	18.4%	7.1%	24.5%	12.2%	4.1%	12.2%	7.1%	85.7%
	Adopted	Count	0	2	1	3	1	3	4	14
		% within Industrial Type	0.0%	22.2%	4.0%	20.0%	20.0%	20.0%	36.4%	14.3%
		% of Total	0.0%	2.0%	1.0%	3.1%	1.0%	3.1%	4.1%	14.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
ABM	Not Adopted	Count	15	8	23	12	5	10	5	78
		% within Industrial Type	83.3%	88.9%	92.0%	80.0%	100.0%	66.7%	45.5%	79.6%
		% of Total	15.3%	8.2%	23.5%	12.2%	5.1%	10.2%	5.1%	79.6%
	Adopted	Count	3	1	2	3	0	5	6	20
		% within Industrial Type	16.7%	11.1%	8.0%	20.0%	0.0%	33.3%	54.5%	20.4%
		% of Total	3.1%	1.0%	2.0%	3.1%	0.0%	5.1%	6.1%	20.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
EVA	Not Adopted	Count	14	8	22	11	2	8	7	72
		% within Industrial Type	77.8%	88.9%	88.0%	73.3%	40.0%	53.3%	63.6%	73.5%
		% of Total	14.3%	8.2%	22.4%	11.2%	2.0%	8.2%	7.1%	73.5%
	Adopted	Count	4	1	3	4	3	7	4	26
		% within Industrial Type	22.2%	11.1%	12.0%	26.7%	60.0%	46.7%	36.4%	26.5%
		% of Total	4.1%	1.0%	3.1%	4.1%	3.1%	7.1%	4.1%	26.5%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Value chain analysis	Not Adopted	Count	15	8	23	12	4	8	7	77
		% within Industrial Type	83.3%	88.9%	92.0%	80.0%	80.0%	53.3%	63.6%	78.6%
		% of Total	15.3%	8.2%	23.5%	12.2%	4.1%	8.2%	7.1%	78.6%
	Adopted	Count	3	1	2	3	1	7	4	21
		% within Industrial Type	16.7%	11.1%	8.0%	20.0%	20.0%	46.7%	36.4%	21.4%
		% of Total	3.1%	1.0%	2.0%	3.1%	1.0%	7.1%	4.1%	21.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Benchmarking - with outside organizations	Not Adopted	Count	17	7	23	12	4	13	8	84
		% within Industrial Type	94.4%	77.8%	92.0%	80.0%	80.0%	86.7%	72.7%	85.7%
		% of Total	17.3%	7.1%	23.5%	12.2%	4.1%	13.3%	8.2%	85.7%
	Adopted	Count	1	2	2	3	1	2	3	14
		% within Industrial Type	5.6%	22.2%	8.0%	20.0%	20.0%	13.3%	27.3%	14.3%
		% of Total	1.0%	2.0%	2.0%	3.1%	1.0%	2.0%	3.1%	14.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Product life cycle analysis	Not Adopted	Count	18	8	22	11	4	13	8	84
		% within Industrial Type	100.0%	88.9%	88.0%	73.3%	80.0%	86.7%	72.7%	85.7%
		% of Total	18.4%	8.2%	22.4%	11.2%	4.1%	13.3%	8.2%	85.7%
	Adopted	Count	0	1	3	4	1	2	3	14
		% within Industrial Type	0.0%	11.1%	12.0%	26.7%	20.0%	13.3%	27.3%	14.3%
		% of Total	0.0%	1.0%	3.1%	4.1%	1.0%	2.0%	3.1%	14.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Operations research techniques	Not Adopted	Count	17	7	23	12	4	13	8	84
		% within Industrial Type	94.4%	77.8%	92.0%	80.0%	80.0%	86.7%	72.7%	85.7%
		% of Total	17.3%	7.1%	23.5%	12.2%	4.1%	13.3%	8.2%	85.7%
	Adopted	Count	1	2	2	3	1	2	3	14
		% within Industrial Type	5.6%	22.2%	8.0%	20.0%	20.0%	13.3%	27.3%	14.3%
		% of Total	1.0%	2.0%	2.0%	3.1%	1.0%	2.0%	3.1%	14.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
JIT	Not Adopted	Count	14	7	22	12	3	12	8	78
		% within Industrial Type	77.8%	77.8%	88.0%	80.0%	60.0%	80.0%	72.7%	79.6%
		% of Total	14.3%	7.1%	22.4%	12.2%	3.1%	12.2%	8.2%	79.6%
	Adopted	Count	4	2	3	3	2	3	3	20
		% within Industrial Type	22.2%	22.2%	12.0%	20.0%	40.0%	20.0%	27.3%	20.4%
		% of Total	4.1%	2.0%	3.1%	3.1%	2.0%	3.1%	3.1%	20.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
SVA	Not Adopted	Count	18	8	22	12	4	13	9	86
		% within Industrial Type	100.0%	88.9%	88.0%	80.0%	80.0%	86.7%	81.8%	87.8%
		% of Total	18.4%	8.2%	22.4%	12.2%	4.1%	13.3%	9.2%	87.8%
	Adopted	Count	0	1	3	3	1	2	2	12
		% within Industrial Type	0.0%	11.1%	12.0%	20.0%	20.0%	13.3%	18.2%	12.2%
		% of Total	0.0%	1.0%	3.1%	3.1%	1.0%	2.0%	2.0%	12.2%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

Appendix K: Long-term Planning Adoption and Types of Industry

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Capital budgeting techniques - NPV	Not Adopted	Count	12	6	16	9	1	11	5	60
		% within Industrial Type	66.7%	66.7%	64.0%	60.0%	20.0%	73.3%	45.5%	61.2%
		% of Total	12.2%	6.1%	16.3%	9.2%	1.0%	11.2%	5.1%	61.2%
	Adopted	Count	6	3	9	6	4	4	6	38
		% within Industrial Type	33.3%	33.3%	36.0%	40.0%	80.0%	26.7%	54.5%	38.8%
		% of Total	6.1%	3.1%	9.2%	6.1%	4.1%	4.1%	6.1%	38.8%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Long range forecasting	Not Adopted	Count	14	7	18	11	2	9	7	68
		% within Industrial Type	77.8%	77.8%	72.0%	73.3%	40.0%	60.0%	63.6%	69.4%
		% of Total	14.3%	7.1%	18.4%	11.2%	2.0%	9.2%	7.1%	69.4%
	Adopted	Count	4	2	7	4	3	6	4	30
		% within Industrial Type	22.2%	22.2%	28.0%	26.7%	60.0%	40.0%	36.4%	30.6%
		% of Total	4.1%	2.0%	7.1%	4.1%	3.1%	6.1%	4.1%	30.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%
Capital budgeting techniques - Payback period	Not Adopted	Count	12	5	17	9	1	11	6	61
		% within Industrial Type	66.7%	55.6%	68.0%	60.0%	20.0%	73.3%	54.5%	62.2%
		% of Total	12.2%	5.1%	17.3%	9.2%	1.0%	11.2%	6.1%	62.2%
	Adopted	Count	6	4	8	6	4	4	5	37
		% within Industrial Type	33.3%	44.4%	32.0%	40.0%	80.0%	26.7%	45.5%	37.8%
		% of Total	6.1%	4.1%	8.2%	6.1%	4.1%	4.1%	5.1%	37.8%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

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			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Capital budgeting techniques - IRR	Not Adopted	Count	12	5	16	9	1	9	5	57
		% within Industrial Type	66.7%	55.6%	64.0%	60.0%	20.0%	60.0%	45.5%	58.2%
		% of Total	12.2%	5.1%	16.3%	9.2%	1.0%	9.2%	5.1%	58.2%
	Adopted	Count	6	4	9	6	4	6	6	41
		% within Industrial Type	33.3%	44.4%	36.0%	40.0%	80.0%	40.0%	54.5%	41.8%
		% of Total	6.1%	4.1%	9.2%	6.1%	4.1%	6.1%	6.1%	41.8%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%
Formal strategic planning	Not Adopted	Count	14	7	17	10	2	7	6	63
		% within Industrial Type	77.8%	77.8%	68.0%	66.7%	40.0%	46.7%	54.5%	64.3%
		% of Total	14.3%	7.1%	17.3%	10.2%	2.0%	7.1%	6.1%	64.3%
	Adopted	Count	4	2	8	5	3	8	5	35
		% within Industrial Type	22.2%	22.2%	32.0%	33.3%	60.0%	53.3%	45.5%	35.7%
		% of Total	4.1%	2.0%	8.2%	5.1%	3.1%	8.2%	5.1%	35.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Strategic plans developed with budgets	Not Adopted	Count	16	8	22	12	3	11	6	78
		% within Industrial Type	88.9%	88.9%	88.0%	80.0%	60.0%	73.3%	54.5%	79.6%
		% of Total	16.3%	8.2%	22.4%	12.2%	3.1%	11.2%	6.1%	79.6%
	Adopted	Count	2	1	3	3	2	4	5	20
		% within Industrial Type	11.1%	11.1%	12.0%	20.0%	40.0%	26.7%	45.5%	20.4%
		% of Total	2.0%	1.0%	3.1%	3.1%	2.0%	4.1%	5.1%	20.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%
Strategic plans developed separately from budgets	Not Adopted	Count	18	8	23	11	3	14	7	84
		% within Industrial Type	100.0%	88.9%	92.0%	73.3%	60.0%	93.3%	63.6%	85.7%
		% of Total	18.4%	8.2%	23.5%	11.2%	3.1%	14.3%	7.1%	85.7%
	Adopted	Count	0	1	2	4	2	1	4	14
		% within Industrial Type	0.0%	11.1%	8.0%	26.7%	40.0%	6.7%	36.4%	14.3%
		% of Total	0.0%	1.0%	2.0%	4.1%	2.0%	1.0%	4.1%	14.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

Appendix L: Product Costing and Types of Industry

			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Absorption costing	Not Adopted	Count	5	4	13	8	1	9	4	44
		% within Industrial Type	27.8%	44.4%	52.0%	53.3%	20.0%	60.0%	36.4%	44.9%
		% of Total	5.1%	4.1%	13.3%	8.2%	1.0%	9.2%	4.1%	44.9%
	Adopted	Count	13	5	12	7	4	6	7	54
		% within Industrial Type	72.2%	55.6%	48.0%	46.7%	80.0%	40.0%	63.6%	55.1%
		% of Total	13.3%	5.1%	12.2%	7.1%	4.1%	6.1%	7.1%	55.1%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Types of Industry							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Standard costing	Not Adopted	Count	10	3	12	7	2	9	5	48
		% within Industrial Type	55.6%	33.3%	48.0%	46.7%	40.0%	60.0%	45.5%	49.0%
		% of Total	10.2%	3.1%	12.2%	7.1%	2.0%	9.2%	5.1%	49.0%
	Adopted	Count	8	6	13	8	3	6	6	50
		% within Industrial Type	44.4%	66.7%	52.0%	53.3%	60.0%	40.0%	54.5%	51.0%
		% of Total	8.2%	6.1%	13.3%	8.2%	3.1%	6.1%	6.1%	51.0%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Cost modelling	Not Adopted	Count	12	7	18	7	4	6	6	60
		% within Industrial Type	66.7%	77.8%	72.0%	46.7%	80.0%	40.0%	54.5%	61.2%
		% of Total	12.2%	7.1%	18.4%	7.1%	4.1%	6.1%	6.1%	61.2%
	Adopted	Count	6	2	7	8	1	9	5	38
		% within Industrial Type	33.3%	22.2%	28.0%	53.3%	20.0%	60.0%	45.5%	38.8%
		% of Total	6.1%	2.0%	7.1%	8.2%	1.0%	9.2%	5.1%	38.8%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Types of Industry							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
ABC	Not Adopted	Count	12	6	16	9	2	9	3	57
		% within Industrial Type	66.7%	66.7%	64.0%	60.0%	40.0%	60.0%	27.3%	58.2%
		% of Total	12.2%	6.1%	16.3%	9.2%	2.0%	9.2%	3.1%	58.2%
	Adopted	Count	6	3	9	6	3	6	8	41
		% within Industrial Type	33.3%	33.3%	36.0%	40.0%	60.0%	40.0%	72.7%	41.8%
		% of Total	6.1%	3.1%	9.2%	6.1%	3.1%	6.1%	8.2%	41.8%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Types of Industry							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Kaizen costing	Not Adopted	Count	14	8	19	12	2	14	8	77
		% within Industrial Type	77.8%	88.9%	76.0%	80.0%	40.0%	93.3%	72.7%	78.6%
		% of Total	14.3%	8.2%	19.4%	12.2%	2.0%	14.3%	8.2%	78.6%
	Adopted	Count	4	1	6	3	3	1	3	21
		% within Industrial Type	22.2%	11.1%	24.0%	20.0%	60.0%	6.7%	27.3%	21.4%
		% of Total	4.1%	1.0%	6.1%	3.1%	3.1%	1.0%	3.1%	21.4%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Types of Industry | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Variable costing	Not Adopted	Count	16	7	20	10	3	10	7	73
		% within Industrial Type	88.9%	77.8%	80.0%	66.7%	60.0%	66.7%	63.6%	74.5%
		% of Total	16.3%	7.1%	20.4%	10.2%	3.1%	10.2%	7.1%	74.5%
	Adopted	Count	2	2	5	5	2	5	4	25
		% within Industrial Type	11.1%	22.2%	20.0%	33.3%	40.0%	33.3%	36.4%	25.5%
		% of Total	2.0%	2.0%	5.1%	5.1%	2.0%	5.1%	4.1%	25.5%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Types of Industry							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Cost of quality	Not Adopted	Count	17	8	22	12	4	12	8	83
		% within Industrial Type	94.4%	88.9%	88.0%	80.0%	80.0%	80.0%	72.7%	84.7%
		% of Total	17.3%	8.2%	22.4%	12.2%	4.1%	12.2%	8.2%	84.7%
	Adopted	Count	1	1	3	3	1	3	3	15
		% within Industrial Type	5.6%	11.1%	12.0%	20.0%	20.0%	20.0%	27.3%	15.3%
		% of Total	1.0%	1.0%	3.1%	3.1%	1.0%	3.1%	3.1%	15.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Types of Industry							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
TC	Not Adopted	Count	18	7	22	12	4	12	8	83
		% within Industrial Type	100.0%	77.8%	88.0%	80.0%	80.0%	80.0%	72.7%	84.7%
		% of Total	18.4%	7.1%	22.4%	12.2%	4.1%	12.2%	8.2%	84.7%
	Adopted	Count	0	2	3	3	1	3	3	15
		% within Industrial Type	0.0%	22.2%	12.0%	20.0%	20.0%	20.0%	27.3%	15.3%
		% of Total	0.0%	2.0%	3.1%	3.1%	1.0%	3.1%	3.1%	15.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Types of Industry							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Throughput accounting	Not Adopted	Count	16	8	23	12	4	12	8	83
		% within Industrial Type	88.9%	88.9%	92.0%	80.0%	80.0%	80.0%	72.7%	84.7%
		% of Total	16.3%	8.2%	23.5%	12.2%	4.1%	12.2%	8.2%	84.7%
	Adopted	Count	2	1	2	3	1	3	3	15
		% within Industrial Type	11.1%	11.1%	8.0%	20.0%	20.0%	20.0%	27.3%	15.3%
		% of Total	2.0%	1.0%	2.0%	3.1%	1.0%	3.1%	3.1%	15.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

Appendix M: Performance Evaluation Adoption and Types of Industry

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - budget variance analysis	Not Adopted	Count	12	6	14	6	2	9	5	54
		% within Industrial Type	66.7%	66.7%	56.0%	40.0%	40.0%	60.0%	45.5%	55.1%
		% of Total	12.2%	6.1%	14.3%	6.1%	2.0%	9.2%	5.1%	55.1%
	Adopted	Count	6	3	11	9	3	6	6	44
		% within Industrial Type	33.3%	33.3%	44.0%	60.0%	60.0%	40.0%	54.5%	44.9%
		% of Total	6.1%	3.1%	11.2%	9.2%	3.1%	6.1%	6.1%	44.9%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
						Industrial Type				
Performance evaluation based on - controllable profit	Not Adopted	Count	15	8	19	7	4	10	7	70
		% within Industrial Type	83.3%	88.9%	76.0%	46.7%	80.0%	66.7%	63.6%	71.4%
		% of Total	15.3%	8.2%	19.4%	7.1%	4.1%	10.2%	7.1%	71.4%
	Adopted	Count	3	1	6	8	1	5	4	28
		% within Industrial Type	16.7%	11.1%	24.0%	53.3%	20.0%	33.3%	36.4%	28.6%
		% of Total	3.1%	1.0%	6.1%	8.2%	1.0%	5.1%	4.1%	28.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

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			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - customer satisfaction surveys	Not Adopted	Count	13	6	19	7	2	10	8	65
		% within Industrial Type	72.2%	66.7%	76.0%	46.7%	40.0%	66.7%	72.7%	66.3%
		% of Total	13.3%	6.1%	19.4%	7.1%	2.0%	10.2%	8.2%	66.3%
	Adopted	Count	5	3	6	8	3	5	3	33
		% within Industrial Type	27.8%	33.3%	24.0%	53.3%	60.0%	33.3%	27.3%	33.7%
		% of Total	5.1%	3.1%	6.1%	8.2%	3.1%	5.1%	3.1%	33.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - divisional profit	Not Adopted	Count	14	7	21	9	2	10	7	70
		% within Industrial Type	77.8%	77.8%	84.0%	60.0%	40.0%	66.7%	63.6%	71.4%
		% of Total	14.3%	7.1%	21.4%	9.2%	2.0%	10.2%	7.1%	71.4%
	Adopted	Count	4	2	4	6	3	5	4	28
		% within Industrial Type	22.2%	22.2%	16.0%	40.0%	60.0%	33.3%	36.4%	28.6%
		% of Total	4.1%	2.0%	4.1%	6.1%	3.1%	5.1%	4.1%	28.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

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			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Performance evaluation based on - team performance	Not Adopted	Count	15	6	20	6	4	11	8	70
		% within Industrial Type	83.3%	66.7%	80.0%	40.0%	80.0%	73.3%	72.7%	71.4%
		% of Total	15.3%	6.1%	20.4%	6.1%	4.1%	11.2%	8.2%	71.4%
	Adopted	Count	3	3	5	9	1	4	3	28
		% within Industrial Type	16.7%	33.3%	20.0%	60.0%	20.0%	26.7%	27.3%	28.6%
		% of Total	3.1%	3.1%	5.1%	9.2%	1.0%	4.1%	3.1%	28.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - BSC	Not Adopted	Count	11	7	18	8	2	10	5	61
		% within Industrial Type	61.1%	77.8%	72.0%	53.3%	40.0%	66.7%	45.5%	62.2%
		% of Total	11.2%	7.1%	18.4%	8.2%	2.0%	10.2%	5.1%	62.2%
	Adopted	Count	7	2	7	7	3	5	6	37
		% within Industrial Type	38.9%	22.2%	28.0%	46.7%	60.0%	33.3%	54.5%	37.8%
		% of Total	7.1%	2.0%	7.1%	7.1%	3.1%	5.1%	6.1%	37.8%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - return (profit) on investment	Not Adopted	Count	15	7	19	7	4	10	6	68
		% within Industrial Type	83.3%	77.8%	76.0%	46.7%	80.0%	66.7%	54.5%	69.4%
		% of Total	15.3%	7.1%	19.4%	7.1%	4.1%	10.2%	6.1%	69.4%
	Adopted	Count	3	2	6	8	1	5	5	30
		% within Industrial Type	16.7%	22.2%	24.0%	53.3%	20.0%	33.3%	45.5%	30.6%
		% of Total	3.1%	2.0%	6.1%	8.2%	1.0%	5.1%	5.1%	30.6%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Performance evaluation based on - CFROI	Not Adopted	Count	12	7	19	9	2	10	6	65
		% within Industrial Type	66.7%	77.8%	76.0%	60.0%	40.0%	66.7%	54.5%	66.3%
		% of Total	12.2%	7.1%	19.4%	9.2%	2.0%	10.2%	6.1%	66.3%
	Adopted	Count	6	2	6	6	3	5	5	33
		% within Industrial Type	33.3%	22.2%	24.0%	40.0%	60.0%	33.3%	45.5%	33.7%
		% of Total	6.1%	2.0%	6.1%	6.1%	3.1%	5.1%	5.1%	33.7%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - production processes	Not Adopted	Count	17	8	22	12	3	11	9	82
		% within Industrial Type	94.4%	88.9%	88.0%	80.0%	60.0%	73.3%	81.8%	83.7%
		% of Total	17.3%	8.2%	22.4%	12.2%	3.1%	11.2%	9.2%	83.7%
	Adopted	Count	1	1	3	3	2	4	2	16
		% within Industrial Type	5.6%	11.1%	12.0%	20.0%	40.0%	26.7%	18.2%	16.3%
		% of Total	1.0%	1.0%	3.1%	3.1%	2.0%	4.1%	2.0%	16.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

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| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - qualitative measures	Not Adopted	Count	17	8	22	12	3	12	7	81
		% within Industrial Type	94.4%	88.9%	88.0%	80.0%	60.0%	80.0%	63.6%	82.7%
		% of Total	17.3%	8.2%	22.4%	12.2%	3.1%	12.2%	7.1%	82.7%
	Adopted	Count	1	1	3	3	2	3	4	17
		% within Industrial Type	5.6%	11.1%	12.0%	20.0%	40.0%	20.0%	36.4%	17.3%
		% of Total	1.0%	1.0%	3.1%	3.1%	2.0%	3.1%	4.1%	17.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

| | | | Industrial Type | | | | | | | |
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - ongoing supplier evaluations	Not Adopted	Count	17	8	21	12	4	13	8	83
		% within Industrial Type	94.4%	88.9%	84.0%	80.0%	80.0%	86.7%	72.7%	84.7%
		% of Total	17.3%	8.2%	21.4%	12.2%	4.1%	13.3%	8.2%	84.7%
	Adopted	Count	1	1	4	3	1	2	3	15
		% within Industrial Type	5.6%	11.1%	16.0%	20.0%	20.0%	13.3%	27.3%	15.3%
		% of Total	1.0%	1.0%	4.1%	3.1%	1.0%	2.0%	3.1%	15.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - employee attitudes	Not Adopted	Count	17	8	24	12	3	13	8	85
		% within Industrial Type	94.4%	88.9%	96.0%	80.0%	60.0%	86.7%	72.7%	86.7%
		% of Total	17.3%	8.2%	24.5%	12.2%	3.1%	13.3%	8.2%	86.7%
	Adopted	Count	1	1	1	3	2	2	3	13
		% within Industrial Type	5.6%	11.1%	4.0%	20.0%	40.0%	13.3%	27.3%	13.3%
		% of Total	1.0%	1.0%	1.0%	3.1%	2.0%	2.0%	3.1%	13.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							Total
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	
Performance evaluation based on - non-financial measures	Not Adopted	Count	18	8	23	12	3	13	6	83
		% within Industrial Type	100.0%	88.9%	92.0%	80.0%	60.0%	86.7%	54.5%	84.7%
		% of Total	18.4%	8.2%	23.5%	12.2%	3.1%	13.3%	6.1%	84.7%
	Adopted	Count	0	1	2	3	2	2	5	15
		% within Industrial Type	0.0%	11.1%	8.0%	20.0%	40.0%	13.3%	45.5%	15.3%
		% of Total	0.0%	1.0%	2.0%	3.1%	2.0%	2.0%	5.1%	15.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

			Industrial Type							
			agro and food industry	consumer products	industrials	property and construction	resources	services	technology	Total
Performance evaluation based on - residual income (e.g. interest adjusted profit)	Not Adopted	Count	17	8	24	10	3	12	8	82
		% within Industrial Type	94.4%	88.9%	96.0%	66.7%	60.0%	80.0%	72.7%	83.7%
		% of Total	17.3%	8.2%	24.5%	10.2%	3.1%	12.2%	8.2%	83.7%
	Adopted	Count	1	1	1	5	2	3	3	16
		% within Industrial Type	5.6%	11.1%	4.0%	33.3%	40.0%	20.0%	27.3%	16.3%
		% of Total	1.0%	1.0%	1.0%	5.1%	2.0%	3.1%	3.1%	16.3%
Total		Count	18	9	25	15	5	15	11	98
		% within Industrial Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	18.4%	9.2%	25.5%	15.3%	5.1%	15.3%	11.2%	100.0%

Appendix N: Budgeting System Adoption and Size of Organisation

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Budgeting systems - controlling costs	Not Adopted	Count	10	10	4	4	8	36
		% within no. of employees	45.5%	40.0%	28.6%	30.8%	33.3%	36.7%
		% of Total	10.2%	10.2%	4.1%	4.1%	8.2%	36.7%
	Adopted	Count	12	15	10	9	16	62
		% within no. of employees	54.5%	60.0%	71.4%	69.2%	66.7%	63.3%
		% of Total	12.2%	15.3%	10.2%	9.2%	16.3%	63.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Budgeting systems - planning cash flows	Not Adopted	Count	13	12	5	6	12	48
		% within no. of employees	59.1%	48.0%	35.7%	46.2%	50.0%	49.0%
		% of Total	13.3%	12.2%	5.1%	6.1%	12.2%	49.0%
	Adopted	Count	9	13	9	7	12	50
		% within no. of employees	40.9%	52.0%	64.3%	53.8%	50.0%	51.0%
		% of Total	9.2%	13.3%	9.2%	7.1%	12.2%	51.0%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Budgeting systems - compensating managers	Not Adopted	Count	16	16	10	11	17	70
		% within no. of employees	72.7%	64.0%	71.4%	84.6%	70.8%	71.4%
		% of Total	16.3%	16.3%	10.2%	11.2%	17.3%	71.4%
	Adopted	Count	6	9	4	2	7	28
		% within no. of employees	27.3%	36.0%	28.6%	15.4%	29.2%	28.6%
		% of Total	6.1%	9.2%	4.1%	2.0%	7.1%	28.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

| | | | The number of company employees located in Thailand: | | | | | |
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Budgeting systems - coordinating activities across the business unit	Not Adopted	Count	15	17	9	6	15	62
		% within no. of employees	68.2%	68.0%	64.3%	46.2%	62.5%	63.3%
		% of Total	15.3%	17.3%	9.2%	6.1%	15.3%	63.3%
	Adopted	Count	7	8	5	7	9	36
		% within no. of employees	31.8%	32.0%	35.7%	53.8%	37.5%	36.7%
		% of Total	7.1%	8.2%	5.1%	7.1%	9.2%	36.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Budgeting systems - planning day-to-day operations	Not Adopted	Count	17	18	10	9	18	72
		% within no. of employees	77.3%	72.0%	71.4%	69.2%	75.0%	73.5%
		% of Total	17.3%	18.4%	10.2%	9.2%	18.4%	73.5%
	Adopted	Count	5	7	4	4	6	26
		% within no. of employees	22.7%	28.0%	28.6%	30.8%	25.0%	26.5%
		% of Total	5.1%	7.1%	4.1%	4.1%	6.1%	26.5%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
ABB	Not Adopted	Count	19	21	10	11	17	78
		% within no. of employees	86.4%	84.0%	71.4%	84.6%	70.8%	79.6%
		% of Total	19.4%	21.4%	10.2%	11.2%	17.3%	79.6%
	Adopted	Count	3	4	4	2	7	20
		% within no. of employees	13.6%	16.0%	28.6%	15.4%	29.2%	20.4%
		% of Total	3.1%	4.1%	4.1%	2.0%	7.1%	20.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Budgeting systems - planning financial position	Not Adopted	Count	19	21	11	8	19	78
		% within no. of employees	86.4%	84.0%	78.6%	61.5%	79.2%	79.6%
		% of Total	19.4%	21.4%	11.2%	8.2%	19.4%	79.6%
	Adopted	Count	3	4	3	5	5	20
		% within no. of employees	13.6%	16.0%	21.4%	38.5%	20.8%	20.4%
		% of Total	3.1%	4.1%	3.1%	5.1%	5.1%	20.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

| | | | The number of company employees located in Thailand: | | | | | |
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Budgeting systems - evaluating managers' performance	Not Adopted	Count	16	20	11	10	17	74
		% within no. of employees	72.7%	80.0%	78.6%	76.9%	70.8%	75.5%
		% of Total	16.3%	20.4%	11.2%	10.2%	17.3%	75.5%
	Adopted	Count	6	5	3	3	7	24
		% within no. of employees	27.3%	20.0%	21.4%	23.1%	29.2%	24.5%
		% of Total	6.1%	5.1%	3.1%	3.1%	7.1%	24.5%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Zero-based budgeting	Not Adopted	Count	17	24	11	9	17	78
		% within no. of employees	77.3%	96.0%	78.6%	69.2%	70.8%	79.6%
		% of Total	17.3%	24.5%	11.2%	9.2%	17.3%	79.6%
	Adopted	Count	5	1	3	4	7	20
		% within no. of employees	22.7%	4.0%	21.4%	30.8%	29.2%	20.4%
		% of Total	5.1%	1.0%	3.1%	4.1%	7.1%	20.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

Appendix O: Decision Support Systems Adoption and Size of Organisations

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Product profitability analysis	Not Adopted	Count	16	18	8	10	13	65
		% within no. of employees	72.7%	72.0%	57.1%	76.9%	54.2%	66.3%
		% of Total	16.3%	18.4%	8.2%	10.2%	13.3%	66.3%
	Adopted	Count	6	7	6	3	11	33
		% within no. of employees	27.3%	28.0%	42.9%	23.1%	45.8%	33.7%
		% of Total	6.1%	7.1%	6.1%	3.1%	11.2%	33.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
TQM	Not Adopted	Count	18	19	8	9	10	64
		% within no. of employees	81.8%	76.0%	57.1%	69.2%	41.7%	65.3%
		% of Total	18.4%	19.4%	8.2%	9.2%	10.2%	65.3%
	Adopted	Count	4	6	6	4	14	34
		% within no. of employees	18.2%	24.0%	42.9%	30.8%	58.3%	34.7%
		% of Total	4.1%	6.1%	6.1%	4.1%	14.3%	34.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Benchmarking - product/service characteristics	Not Adopted	Count	17	19	8	8	17	69
		% within no. of employees	77.3%	76.0%	57.1%	61.5%	70.8%	70.4%
		% of Total	17.3%	19.4%	8.2%	8.2%	17.3%	70.4%
	Adopted	Count	5	6	6	5	7	29
		% within no. of employees	22.7%	24.0%	42.9%	38.5%	29.2%	29.6%
		% of Total	5.1%	6.1%	6.1%	5.1%	7.1%	29.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
CPA	Not Adopted	Count	18	19	8	10	17	72
		% within no. of employees	81.8%	76.0%	57.1%	76.9%	70.8%	73.5%
		% of Total	18.4%	19.4%	8.2%	10.2%	17.3%	73.5%
	Adopted	Count	4	6	6	3	7	26
		% within no. of employees	18.2%	24.0%	42.9%	23.1%	29.2%	26.5%
		% of Total	4.1%	6.1%	6.1%	3.1%	7.1%	26.5%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
CVP	Not Adopted	Count	18	18	7	11	12	66
		% within no. of employees	81.8%	72.0%	50.0%	84.6%	50.0%	67.3%
		% of Total	18.4%	18.4%	7.1%	11.2%	12.2%	67.3%
	Adopted	Count	4	7	7	2	12	32
		% within no. of employees	18.2%	28.0%	50.0%	15.4%	50.0%	32.7%
		% of Total	4.1%	7.1%	7.1%	2.0%	12.2%	32.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
BSC separately from performance evaluation	Not Adopted	Count	17	23	11	7	17	75
		% within no. of employees	77.3%	92.0%	78.6%	53.8%	70.8%	76.5%
		% of Total	17.3%	23.5%	11.2%	7.1%	17.3%	76.5%
	Adopted	Count	5	2	3	6	7	23
		% within no. of employees	22.7%	8.0%	21.4%	46.2%	29.2%	23.5%
		% of Total	5.1%	2.0%	3.1%	6.1%	7.1%	23.5%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Benchmarking - strategic priorities	Not Adopted	Count	17	18	9	9	17	70
		% within no. of employees	77.3%	72.0%	64.3%	69.2%	70.8%	71.4%
		% of Total	17.3%	18.4%	9.2%	9.2%	17.3%	71.4%
	Adopted	Count	5	7	5	4	7	28
		% within no. of employees	22.7%	28.0%	35.7%	30.8%	29.2%	28.6%
		% of Total	5.1%	7.1%	5.1%	4.1%	7.1%	28.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					Total
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	
Benchmarking - management process	Not Adopted	Count	18	18	10	11	20	77
		% within no. of employees	81.8%	72.0%	71.4%	84.6%	83.3%	78.6%
		% of Total	18.4%	18.4%	10.2%	11.2%	20.4%	78.6%
	Adopted	Count	4	7	4	2	4	21
		% within no. of employees	18.2%	28.0%	28.6%	15.4%	16.7%	21.4%
		% of Total	4.1%	7.1%	4.1%	2.0%	4.1%	21.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Benchmarking - operational process	Not Adopted	Count	17	16	9	9	18	69
		% within no. of employees	77.3%	64.0%	64.3%	69.2%	75.0%	70.4%
		% of Total	17.3%	16.3%	9.2%	9.2%	18.4%	70.4%
	Adopted	Count	5	9	5	4	6	29
		% within no. of employees	22.7%	36.0%	35.7%	30.8%	25.0%	29.6%
		% of Total	5.1%	9.2%	5.1%	4.1%	6.1%	29.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

| | | | The number of company employees located in Thailand: | | | | | |
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Benchmarking - carried out within the wider organization	Not Adopted	Count	19	24	12	11	18	84
		% within no. of employees	86.4%	96.0%	85.7%	84.6%	75.0%	85.7%
		% of Total	19.4%	24.5%	12.2%	11.2%	18.4%	85.7%
	Adopted	Count	3	1	2	2	6	14
		% within no. of employees	13.6%	4.0%	14.3%	15.4%	25.0%	14.3%
		% of Total	3.1%	1.0%	2.0%	2.0%	6.1%	14.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
ABM	Not Adopted	Count	18	22	11	9	18	78
		% within no. of employees	81.8%	88.0%	78.6%	69.2%	75.0%	79.6%
		% of Total	18.4%	22.4%	11.2%	9.2%	18.4%	79.6%
	Adopted	Count	4	3	3	4	6	20
		% within no. of employees	18.2%	12.0%	21.4%	30.8%	25.0%	20.4%
		% of Total	4.1%	3.1%	3.1%	4.1%	6.1%	20.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					Total
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	
EVA	Not Adopted	Count	18	20	11	10	13	72
		% within no. of employees	81.8%	80.0%	78.6%	76.9%	54.2%	73.5%
		% of Total	18.4%	20.4%	11.2%	10.2%	13.3%	73.5%
	Adopted	Count	4	5	3	3	11	26
		% within no. of employees	18.2%	20.0%	21.4%	23.1%	45.8%	26.5%
		% of Total	4.1%	5.1%	3.1%	3.1%	11.2%	26.5%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Value chain analysis	Not Adopted	Count	17	23	11	10	16	77
		% within no. of employees	77.3%	92.0%	78.6%	76.9%	66.7%	78.6%
		% of Total	17.3%	23.5%	11.2%	10.2%	16.3%	78.6%
	Adopted	Count	5	2	3	3	8	21
		% within no. of employees	22.7%	8.0%	21.4%	23.1%	33.3%	21.4%
		% of Total	5.1%	2.0%	3.1%	3.1%	8.2%	21.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

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			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Benchmarking - with outside organizations	Not Adopted	Count	18	24	11	11	20	84
		% within no. of employees	81.8%	96.0%	78.6%	84.6%	83.3%	85.7%
		% of Total	18.4%	24.5%	11.2%	11.2%	20.4%	85.7%
	Adopted	Count	4	1	3	2	4	14
		% within no. of employees	18.2%	4.0%	21.4%	15.4%	16.7%	14.3%
		% of Total	4.1%	1.0%	3.1%	2.0%	4.1%	14.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Product life cycle analysis	Not Adopted	Count	18	25	11	11	19	84
		% within no. of employees	81.8%	100.0%	78.6%	84.6%	79.2%	85.7%
		% of Total	18.4%	25.5%	11.2%	11.2%	19.4%	85.7%
	Adopted	Count	4	0	3	2	5	14
		% within no. of employees	18.2%	0.0%	21.4%	15.4%	20.8%	14.3%
		% of Total	4.1%	0.0%	3.1%	2.0%	5.1%	14.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
			The number of company employees located in Thailand:				
Operations research techniques	Not Adopted	Count	18	24	11	12	19	84
		% within no. of employees	81.8%	96.0%	78.6%	92.3%	79.2%	85.7%
		% of Total	18.4%	24.5%	11.2%	12.2%	19.4%	85.7%
	Adopted	Count	4	1	3	1	5	14
		% within no. of employees	18.2%	4.0%	21.4%	7.7%	20.8%	14.3%
		% of Total	4.1%	1.0%	3.1%	1.0%	5.1%	14.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
JIT	Not Adopted	Count	19	20	12	11	16	78
		% within no. of employees	86.4%	80.0%	85.7%	84.6%	66.7%	79.6%
		% of Total	19.4%	20.4%	12.2%	11.2%	16.3%	79.6%
	Adopted	Count	3	5	2	2	8	20
		% within no. of employees	13.6%	20.0%	14.3%	15.4%	33.3%	20.4%
		% of Total	3.1%	5.1%	2.0%	2.0%	8.2%	20.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					Total
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	
SVA	Not Adopted	Count	19	25	11	11	20	86
		% within no. of employees	86.4%	100.0%	78.6%	84.6%	83.3%	87.8%
		% of Total	19.4%	25.5%	11.2%	11.2%	20.4%	87.8%
	Adopted	Count	3	0	3	2	4	12
		% within no. of employees	13.6%	0.0%	21.4%	15.4%	16.7%	12.2%
		% of Total	3.1%	0.0%	3.1%	2.0%	4.1%	12.2%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

Appendix P: Long-term Planning Adoption and Size of Organisations

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Capital budgeting techniques - NPV	Not Adopted	Count	16	17	8	6	13	60
		% within no. of employees	72.7%	68.0%	57.1%	46.2%	54.2%	61.2%
		% of Total	16.3%	17.3%	8.2%	6.1%	13.3%	61.2%
	Adopted	Count	6	8	6	7	11	38
		% within no. of employees	27.3%	32.0%	42.9%	53.8%	45.8%	38.8%
		% of Total	6.1%	8.2%	6.1%	7.1%	11.2%	38.8%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Long range forecasting	Not Adopted	Count	18	20	7	11	12	68
		% within no. of employees	81.8%	80.0%	50.0%	84.6%	50.0%	69.4%
		% of Total	18.4%	20.4%	7.1%	11.2%	12.2%	69.4%
	Adopted	Count	4	5	7	2	12	30
		% within no. of employees	18.2%	20.0%	50.0%	15.4%	50.0%	30.6%
		% of Total	4.1%	5.1%	7.1%	2.0%	12.2%	30.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Capital budgeting techniques - Payback period	Not Adopted	Count	16	17	7	8	13	61
		% within no. of employees	72.7%	68.0%	50.0%	61.5%	54.2%	62.2%
		% of Total	16.3%	17.3%	7.1%	8.2%	13.3%	62.2%
	Adopted	Count	6	8	7	5	11	37
		% within no. of employees	27.3%	32.0%	50.0%	38.5%	45.8%	37.8%
		% of Total	6.1%	8.2%	7.1%	5.1%	11.2%	37.8%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Capital budgeting techniques - IRR	Not Adopted	Count	16	15	8	6	12	57
		% within no. of employees	72.7%	60.0%	57.1%	46.2%	50.0%	58.2%
		% of Total	16.3%	15.3%	8.2%	6.1%	12.2%	58.2%
	Adopted	Count	6	10	6	7	12	41
		% within no. of employees	27.3%	40.0%	42.9%	53.8%	50.0%	41.8%
		% of Total	6.1%	10.2%	6.1%	7.1%	12.2%	41.8%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Formal strategic planning	Not Adopted	Count	18	18	8	9	10	63
		% within no. of employees	81.8%	72.0%	57.1%	69.2%	41.7%	64.3%
		% of Total	18.4%	18.4%	8.2%	9.2%	10.2%	64.3%
	Adopted	Count	4	7	6	4	14	35
		% within no. of employees	18.2%	28.0%	42.9%	30.8%	58.3%	35.7%
		% of Total	4.1%	7.1%	6.1%	4.1%	14.3%	35.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

| | | | The number of company employees located in Thailand: | | | | | |
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Strategic plans developed with budgets	Not Adopted	Count	17	23	11	10	17	78
		% within no. of employees	77.3%	92.0%	78.6%	76.9%	70.8%	79.6%
		% of Total	17.3%	23.5%	11.2%	10.2%	17.3%	79.6%
	Adopted	Count	5	2	3	3	7	20
		% within no. of employees	22.7%	8.0%	21.4%	23.1%	29.2%	20.4%
		% of Total	5.1%	2.0%	3.1%	3.1%	7.1%	20.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Strategic plans developed separately from budgets	Not Adopted	Count	18	23	11	12	20	84
		% within no. of employees	81.8%	92.0%	78.6%	92.3%	83.3%	85.7%
		% of Total	18.4%	23.5%	11.2%	12.2%	20.4%	85.7%
	Adopted	Count	4	2	3	1	4	14
		% within no. of employees	18.2%	8.0%	21.4%	7.7%	16.7%	14.3%
		% of Total	4.1%	2.0%	3.1%	1.0%	4.1%	14.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

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Appendix Q: Product Costing Adoption and Size of Organisations

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Absorption costing	Not Adopted	Count	8	13	5	5	13	44
		% within no. of employees	36.4%	52.0%	35.7%	38.5%	54.2%	44.9%
		% of Total	8.2%	13.3%	5.1%	5.1%	13.3%	44.9%
	Adopted	Count	14	12	9	8	11	54
		% within no. of employees	63.6%	48.0%	64.3%	61.5%	45.8%	55.1%
		% of Total	14.3%	12.2%	9.2%	8.2%	11.2%	55.1%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Standard costing	Not Adopted	Count	11	11	6	8	12	48
		% within no. of employees	50.0%	44.0%	42.9%	61.5%	50.0%	49.0%
		% of Total	11.2%	11.2%	6.1%	8.2%	12.2%	49.0%
	Adopted	Count	11	14	8	5	12	50
		% within no. of employees	50.0%	56.0%	57.1%	38.5%	50.0%	51.0%
		% of Total	11.2%	14.3%	8.2%	5.1%	12.2%	51.0%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Cost modeling	Not Adopted	Count	14	15	7	9	15	60
		% within no. of employees	63.6%	60.0%	50.0%	69.2%	62.5%	61.2%
		% of Total	14.3%	15.3%	7.1%	9.2%	15.3%	61.2%
	Adopted	Count	8	10	7	4	9	38
		% within no. of employees	36.4%	40.0%	50.0%	30.8%	37.5%	38.8%
		% of Total	8.2%	10.2%	7.1%	4.1%	9.2%	38.8%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
ABC	Not Adopted	Count	16	15	7	4	15	57
		% within no. of employees	72.7%	60.0%	50.0%	30.8%	62.5%	58.2%
		% of Total	16.3%	15.3%	7.1%	4.1%	15.3%	58.2%
	Adopted	Count	6	10	7	9	9	41
		% within no. of employees	27.3%	40.0%	50.0%	69.2%	37.5%	41.8%
		% of Total	6.1%	10.2%	7.1%	9.2%	9.2%	41.8%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Kaizen costing	Not Adopted	Count	18	22	9	12	16	77
		% within no. of employees	81.8%	88.0%	64.3%	92.3%	66.7%	78.6%
		% of Total	18.4%	22.4%	9.2%	12.2%	16.3%	78.6%
	Adopted	Count	4	3	5	1	8	21
		% within no. of employees	18.2%	12.0%	35.7%	7.7%	33.3%	21.4%
		% of Total	4.1%	3.1%	5.1%	1.0%	8.2%	21.4%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Variable costing	Not Adopted	Count	18	22	10	8	15	73
		% within no. of employees	81.8%	88.0%	71.4%	61.5%	62.5%	74.5%
		% of Total	18.4%	22.4%	10.2%	8.2%	15.3%	74.5%
	Adopted	Count	4	3	4	5	9	25
		% within no. of employees	18.2%	12.0%	28.6%	38.5%	37.5%	25.5%
		% of Total	4.1%	3.1%	4.1%	5.1%	9.2%	25.5%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Cost of quality	Not Adopted	Count	19	23	11	11	19	83
		% within no. of employees	86.4%	92.0%	78.6%	84.6%	79.2%	84.7%
		% of Total	19.4%	23.5%	11.2%	11.2%	19.4%	84.7%
	Adopted	Count	3	2	3	2	5	15
		% within no. of employees	13.6%	8.0%	21.4%	15.4%	20.8%	15.3%
		% of Total	3.1%	2.0%	3.1%	2.0%	5.1%	15.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
TC	Not Adopted	Count	19	24	11	11	18	83
		% within no. of employees	86.4%	96.0%	78.6%	84.6%	75.0%	84.7%
		% of Total	19.4%	24.5%	11.2%	11.2%	18.4%	84.7%
	Adopted	Count	3	1	3	2	6	15
		% within no. of employees	13.6%	4.0%	21.4%	15.4%	25.0%	15.3%
		% of Total	3.1%	1.0%	3.1%	2.0%	6.1%	15.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Throughput accounting	Not Adopted	Count	17	24	12	11	19	83
		% within no. of employees	77.3%	96.0%	85.7%	84.6%	79.2%	84.7%
		% of Total	17.3%	24.5%	12.2%	11.2%	19.4%	84.7%
	Adopted	Count	5	1	2	2	5	15
		% within no. of employees	22.7%	4.0%	14.3%	15.4%	20.8%	15.3%
		% of Total	5.1%	1.0%	2.0%	2.0%	5.1%	15.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

Appendix R: Performance Evaluation Adoption and Size of Organisations

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - budget variance analysis	Not Adopted	Count	13	13	6	9	13	54
		% within no. of employees	59.1%	52.0%	42.9%	69.2%	54.2%	55.1%
		% of Total	13.3%	13.3%	6.1%	9.2%	13.3%	55.1%
	Adopted	Count	9	12	8	4	11	44
		% within no. of employees	40.9%	48.0%	57.1%	30.8%	45.8%	44.9%
		% of Total	9.2%	12.2%	8.2%	4.1%	11.2%	44.9%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - controllable profit	Not Adopted	Count	17	18	9	10	16	70
		% within no. of employees	77.3%	72.0%	64.3%	76.9%	66.7%	71.4%
		% of Total	17.3%	18.4%	9.2%	10.2%	16.3%	71.4%
	Adopted	Count	5	7	5	3	8	28
		% within no. of employees	22.7%	28.0%	35.7%	23.1%	33.3%	28.6%
		% of Total	5.1%	7.1%	5.1%	3.1%	8.2%	28.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - customer satisfaction surveys	Not Adopted	Count	16	17	8	10	14	65
		% within no. of employees	72.7%	68.0%	57.1%	76.9%	58.3%	66.3%
		% of Total	16.3%	17.3%	8.2%	10.2%	14.3%	66.3%
	Adopted	Count	6	8	6	3	10	33
		% within no. of employees	27.3%	32.0%	42.9%	23.1%	41.7%	33.7%
		% of Total	6.1%	8.2%	6.1%	3.1%	10.2%	33.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - divisional profit	Not Adopted	Count	16	19	10	10	15	70
		% within no. of employees	72.7%	76.0%	71.4%	76.9%	62.5%	71.4%
		% of Total	16.3%	19.4%	10.2%	10.2%	15.3%	71.4%
	Adopted	Count	6	6	4	3	9	28
		% within no. of employees	27.3%	24.0%	28.6%	23.1%	37.5%	28.6%
		% of Total	6.1%	6.1%	4.1%	3.1%	9.2%	28.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - team performance	Not Adopted	Count	17	17	8	10	18	70
		% within no. of employees	77.3%	68.0%	57.1%	76.9%	75.0%	71.4%
		% of Total	17.3%	17.3%	8.2%	10.2%	18.4%	71.4%
	Adopted	Count	5	8	6	3	6	28
		% within no. of employees	22.7%	32.0%	42.9%	23.1%	25.0%	28.6%
		% of Total	5.1%	8.2%	6.1%	3.1%	6.1%	28.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - BSC	Not Adopted	Count	14	18	10	9	10	61
		% within no. of employees	63.6%	72.0%	71.4%	69.2%	41.7%	62.2%
		% of Total	14.3%	18.4%	10.2%	9.2%	10.2%	62.2%
	Adopted	Count	8	7	4	4	14	37
		% within no. of employees	36.4%	28.0%	28.6%	30.8%	58.3%	37.8%
		% of Total	8.2%	7.1%	4.1%	4.1%	14.3%	37.8%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - return (profit) on investment	Not Adopted	Count	17	18	7	11	15	68
		% within no. of employees	77.3%	72.0%	50.0%	84.6%	62.5%	69.4%
		% of Total	17.3%	18.4%	7.1%	11.2%	15.3%	69.4%
	Adopted	Count	5	7	7	2	9	30
		% within no. of employees	22.7%	28.0%	50.0%	15.4%	37.5%	30.6%
		% of Total	5.1%	7.1%	7.1%	2.0%	9.2%	30.6%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - CFROI	Not Adopted	Count	15	20	9	8	13	65
		% within no. of employees	68.2%	80.0%	64.3%	61.5%	54.2%	66.3%
		% of Total	15.3%	20.4%	9.2%	8.2%	13.3%	66.3%
	Adopted	Count	7	5	5	5	11	33
		% within no. of employees	31.8%	20.0%	35.7%	38.5%	45.8%	33.7%
		% of Total	7.1%	5.1%	5.1%	5.1%	11.2%	33.7%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - production processes	Not Adopted	Count	18	24	11	11	18	82
		% within no. of employees	81.8%	96.0%	78.6%	84.6%	75.0%	83.7%
		% of Total	18.4%	24.5%	11.2%	11.2%	18.4%	83.7%
	Adopted	Count	4	1	3	2	6	16
		% within no. of employees	18.2%	4.0%	21.4%	15.4%	25.0%	16.3%
		% of Total	4.1%	1.0%	3.1%	2.0%	6.1%	16.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - qualitative measures	Not Adopted	Count	17	24	11	11	18	81
		% within no. of employees	77.3%	96.0%	78.6%	84.6%	75.0%	82.7%
		% of Total	17.3%	24.5%	11.2%	11.2%	18.4%	82.7%
	Adopted	Count	5	1	3	2	6	17
		% within no. of employees	22.7%	4.0%	21.4%	15.4%	25.0%	17.3%
		% of Total	5.1%	1.0%	3.1%	2.0%	6.1%	17.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - ongoing supplier evaluations	Not Adopted	Count	17	23	11	13	19	83
		% within no. of employees	77.3%	92.0%	78.6%	100.0%	79.2%	84.7%
		% of Total	17.3%	23.5%	11.2%	13.3%	19.4%	84.7%
	Adopted	Count	5	2	3	0	5	15
		% within no. of employees	22.7%	8.0%	21.4%	0.0%	20.8%	15.3%
		% of Total	5.1%	2.0%	3.1%	0.0%	5.1%	15.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - employee attitudes	Not Adopted	Count	18	24	12	11	20	85
		% within no. of employees	81.8%	96.0%	85.7%	84.6%	83.3%	86.7%
		% of Total	18.4%	24.5%	12.2%	11.2%	20.4%	86.7%
	Adopted	Count	4	1	2	2	4	13
		% within no. of employees	18.2%	4.0%	14.3%	15.4%	16.7%	13.3%
		% of Total	4.1%	1.0%	2.0%	2.0%	4.1%	13.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

			The number of company employees located in Thailand:					
			Under 250	251 - 750	751 – 1,250	1,251 – 2,500	Over 2,500	Total
Performance evaluation based on - non-financial measures	Not Adopted	Count	19	22	12	12	18	83
		% within no. of employees	86.4%	88.0%	85.7%	92.3%	75.0%	84.7%
		% of Total	19.4%	22.4%	12.2%	12.2%	18.4%	84.7%
	Adopted	Count	3	3	2	1	6	15
		% within no. of employees	13.6%	12.0%	14.3%	7.7%	25.0%	15.3%
		% of Total	3.1%	3.1%	2.0%	1.0%	6.1%	15.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%
Performance evaluation based on - residual income (e.g. interest adjusted profit)	Not Adopted	Count	19	23	11	11	18	82
		% within no. of employees	86.4%	92.0%	78.6%	84.6%	75.0%	83.7%
		% of Total	19.4%	23.5%	11.2%	11.2%	18.4%	83.7%
	Adopted	Count	3	2	3	2	6	16
		% within no. of employees	13.6%	8.0%	21.4%	15.4%	25.0%	16.3%
		% of Total	3.1%	2.0%	3.1%	2.0%	6.1%	16.3%
Total		Count	22	25	14	13	24	98
		% within no. of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.4%	25.5%	14.3%	13.3%	24.5%	100.0%

Appendix S: The Adoption Rates of ABC and BSC in Different Countries

Authors	Countries	Years of data collection	Adoption rates (%)	
			ABC	BSC
Chenhall and Langfield-Smith (1998a)	Australia (n=78)	1990s	56	88
Joshi (2001)	India (n=60)	1998	20	40
Hyvönen (2005)	Finland (n=51)	2000s	80	73
Joshi *et al.* (2011)	Gulf Cooperation Council[52] (n=57)	2006	39	31
Angelakis *et al.* (2010)	Greece (n=83)	2006	62	49
Yalcin (2012)	Turkey (n=80)	2010	39	40
This study	Thailand (n=98)	2012	42	38

[52] The Gulf Cooperation Council consists of six countries: Bahrain, Kuwait, Saudi Arabia, Oman, Qatar, and the United Arab Emirates.