Determinant of Contingency Factors of AIS in ERP System

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Abstract:
During the last decade, implementation of AIS in ERP to improve the performance of the organization has dramatically increased, in Sri Lanka. However, very little empirical research has been carried out in Sri Lanka to investigate the situation. Therefore, this study is to evaluate the factors that influence the AIS in ERP environment of the listed companies which implement the ERP system in Sri Lanka. Therefore,this study was aimed to investigate four closely related contingency factors (Top Management Support, External Expert Support, User Competency, and Internal Control System) that influence on AIS.The primary data were collected for this study using a self-administered questionnaire from 214 accounting professionalsfrom public listed companies. Statistical confirmation of the conceptual model was ensured using Structural Equation Modeling (AMOS 23). This study revealed that Top Management Support, External Expert Support, and User Competency were significantly influenced on ERP System Quality. Similarly, only two factors: Top Management Support and External Expert Support were influenced on AIQ. However, Internal Control System was not influenced on ERP System Quality and AIQ. Meanwhile, User Competency was not influenced on AIQ. Moreover, ERP System Quality has an impact on AIQ.This study concludes that Top management, External Expert Support and User Competency were significantly influenced on AIS in ERP Environment. In addition, the result revealed that there was a mediating effect of ERP system Quality between Contingency factor and AIQ.Therefore, an organization need to pay more attention on Top Management Support, External Expert Support, User Competency in implementing AIS. This, in turn, will facilitate the public listed companies to contribute to the growth of the country as a whole.

Keywords: *ERP System Quality, Accounting Information Quality, Top Management Support, External Expert Support, User Competency, and Internal Control System.*

I. Background of the study

AIS is one of the enterprise systems that hasbeen widely implemented by different organizations (Bavarsad, Rahimi, &Norozy. 2013; Rom & Rohde, 2007). Hence, AIS is popularizedin using Information System (IS) that helps to make a decision, control and improve organizational performance.Therefore,AIS is a significantly important for successful business operation and organizational performance. The improvement of the ERP system is to process accounting information system (Spathis and Constantinides,

2004). They further stated that "AIS is the heart of the ERP system". Quality of Information has resulted by the successful implementation and use of ERP. Sacer (2013)stated that organizationalachievementdepends on the information qualitywhich is brought by information system quality. The information quality refers to the quality of output of the information system produces (DeLone & McLean, 1992). Meanwhile, system quality refers to the processing of a system that measures the extent to which the system is technically sound. It was further empahasized as "system quality and

information quality have a positive impact on organizational performance" (Alzoubi, 2011). Reviewed literature evidenced that there were several studiesconductedto measure the impact of system quality and information quality on organizational performance in an ERP environment (Gorla et al., 2010; Daoud & Triki, 2013).

Several studies have investigated the contingency approach states that AIS needs to be aligned with other contingency factors.The alignments between contingency factors such as Top Management Support, External Expert Support, User Competency and Internal Control System have significant impacts on the quality of the system as well as quality of the information. Schwalbe (2010) suggests that top management support is major factor in the information systems implementation. Al-Hiyari et al., (2013) also stated that top management who plays many roles in the implementing of IS actively should have a willingness to allocate resources, and they become drivers to make employees motivated and aligned in implementing an information system. Similarly, User Competency has a significant impact on AIS (Nicolaou, 2000). Hsiung and Wang,(2014) stated that any organization can increase its wealth and maintain its effective operation by implementing an ERP system which has proper internal control mechanism.

The two dimensions of AIS in an ERP environment are the ERP System Quality and AIQ(Daoud & Triki, 2013). The success of an organization can be drawn through an information system, organizational support (Top Management Support), external support (External Expert Support), Control System (Internal Control System) and human factors (User Competency). This area of researchneeds to be studied empirically and statistically tested to contribute to the existing body of knowledge in the context of developing market like Sri Lanka.

II. Statement of Problem

With the repid changes of technologies many organizations intended to keep new technologies to compete in the market (SpathisandConstantinides, 2004). An ERP is such a new technology that encompasses a set of business application such as accounting, stock control, supply chain, customer relationship management, logistics etc. Further, ERP generates an integrated enterprise application which in turn provides collective information on various integrated business modules.

The introduction of an ERP system to the business process reduces duplication of input information and helps to maintain accuracy. Meanwhile, it also reduces the cost of the business processes and facilitates the operation of the businessesin electronic environment. Therefore, AIS plays a vital role in providing accurate accounting information that helps to achieve the goals of the organization and improve the performance of the business. The implementation of ERP is rapidly growing in Sri Lanka for the past few years (Wickramaarachchi&Jayasiri, 2015). Nevertheless, ERP was started to use two decades back acrossthe world and now the majority of the companies which were using ERP are reaping the benefits of the implementation. As a result, a need was emerged to a significant number of large companies in Sri Lanka to forcefully use the ERP system and work with the ERP environment. Therefore, new approaches were embraced. Studies have found that the factors influence on AIS are Top Management Support (Daoud and Triki, 2013; Sheth ,2010; Aleqab and Ismail 2011), External Expert Support (Daoud and Triki, 2013), Internal Control System (Romney et al., 2012; Elder et al., 2010; Hsiung & Wang, 2014; Azhar, 2008), and User Competency (Daoud and Triki, 2013; Hiyari et al.,2013; Afih and Indahwati, 2015).

Previous literature shows that many AIS studies considered different contingency factors such as organisational structure, business strategy, and environmental condition in their study (Chenhall&Langfield-Smith, 1998; Chong & Chong, 1997; Mia & Clarke, 1999). Nonetheless, those studies ignored the major influencing factors on AIS in ERP environments such as Top management, External Expert Support, User Competency and Internal Control System. Peter, DeLone and McLean (2013) stated that "Comprehensive and integrative research on the variable that influences on IS success has been lacking".

Unfortunately, in Sri Lankan context, researchers have given a very little attention on systematic approach in relation to AIS and ERP environment. Nonetheless, De Silva et al., (2011) focused on the impact of ERP Systems on Management Accounting in a private company. De Alwis and Disanayaka (2011) focused the middlemanagers' attitudes on business performance in an ERP environment.

However, there is a dearth of published research on AIS success in ERP environment includingall contingency factors: Top Management Support, External Expert Support, User Competency, and Internal Control System, in a single study. This concept of the research remains statistically untested in Sri Lanka, and therefore, this would be a novel contribution to existing literature and bring new insight to the AIS and ERP literature that combines allimportant contingency variables in one study which investigates the AIS success in ERP environment.

The study of the contingency factors (Top Management Support, External Expert Support, User Competency and Internal Control System)that influence the AIS(System Quality and Information Quality) in ERP environment in

public listed companies remain unstudied in a developed and developing market.

III. Research Questions

This research attempts to evaluate the contingency factors that influence the AIS in ERP environment of the listed companies which implement ERP system in Sri Lanka based on the following research questions.

1. What are the contingency factors that influence the AIS in ERP environment In Sri Lankan Public listed companies?

2. Does the ERP system Quality mediate between contingency factors and AIQ?

Research Objectives
1. To identify the influence of contingency factors (Top Management Support, External Expert Support, Internal Control System ,User Competency) on AIS in an ERP environment.
2. To measure the mediating effect of ERP System Quality on AIQ.

Theoretical Background
This study is focused on IS success Model (Delone and McLean(1992, 2003), and Galbraith's (1973,1977) contingency theory to find the relationship between contingency factors including Top Management Support , External Expert Support, User Competency, and Internal Control Systemand AIS.

The Information System Success theory:-

Delone and McLean's model (1992)
DeLone and McLean's IS success model is one of the dominant models in IS success which was presented an updated to new version in 2003 (DeLone & McLean, 2003) . This IS success model is identified by researchers as a basis for their study. Bacause, theupdated model of Delone and McLean's (2003) consists of the net benefit of the organization and the model is capable to

respond to the prominent change of the industry. In addition, it contributed immensely to academic researchers as well as practitioners. Having discussed both their model the same year Gable et al (2003) developed IS Success model by adding vendor consultancy and workgroup impact to the system success in addition tothe variables of Delon and McLean's model

Further, Gable et al., (2003) stated that the contribution of IS success models(Delone and McLean)plays a crucial role in implementing IS in an organisation. The main argument of the Delone and McLean IS success model highlights the use of constructs, which many researchers suggest that these measures are not suitable in some context(e.g., Seddon 1997; Young 1989).Though, Delone and McLean (1992) themselves suggest that "usage, either perceived or actual, is only important when such use is not mandatory". At this argument, it is a need to descript the role of ERP system success. The understanding of ERP success focuses to use it in order to bring efficiency and effectiveness of an organization(DeLone & McLean, 1992; Gable et al., 2003; Sedera et al., 2003). Further, Ifinedo, (2006) Considers the experts and their expertise and support to be important to ERP success. In the same vein, Markus and Tanis (2000) also focused the "dependence on vendors" as a key role in implementing ERP system. Therefore, vendor support is of key importance to IS success.

The evaluation of AIS is marked by the adoption of an ERP system. The modern AIS is having the greatest opportunity and potential impact on Firm Performance. Delone and McLean (1992) and Peter, Delone, and Mclean (2013) also acknowledged the limitation of information success factors of the organization. To support this argument, Delone and McLean (1992) and Peter, Delone and McLean(2013) recommend that contingency variables should be considered to

develop a comprehensive model for a specific framework. Therefore, it is important to discuss the contingency theory and past studies.

IV.   Contingency Theory

The Contingency theory is a method to focus the behavior of organisationin which justifications are considered to how contingent factors such as technology, organizational, human, culture and the external environment influence the design and function of organizations (Fiedler, 1964). Using literature review, previous researchers focused with contingency factors and AIS in the context of AIS (Chong & Chong 1997; Mia & Clarke 1999)' or some other researchers focused between contingency factors and IT sophistication (Weill & Olson 1989; Henderson & Venkatraman 1993), particularly among large firms.This study suggests that there is an interaction between the factors influencing on AIS. This concludes, however, that these factors are not independent of each other eventually (Daoud &Triki, 2013).

Top Management Support

Top Management Support (TSS) refers to what extent they understand the system used and involved in implementing a system. Moreover, the main role of their support is focusing to work with users to be positive in implementing a system.According to Lertwongsatien, and Wongpinunwatana, (2003) top management support plays a crucial role in implementing AIS. The top-level management usually takes a role in changing the behavior thatmotivates to bring the result of AIS. Therefore, the most important role they play is to bring the quality of financial statement through effective AIS. These kinds of activities bring new opportunities and also maintaingood practicesto use resources effectively. Previous studies have highlighted that top management support is an important determinant of the organization's success. Specifically, Top Management Support has played a vital role in bringing the success of ERP

implementation (Ngai et al., 2008).Major three dimensions of Top Management Support includes the Authority, participation and commitment (Jarvenpaa& Ives, 1999).

External Expert Supports

External expert support refers to the degree to which they provide training, disseminating knowledge, maintaining and providing technical assistance to the organization. Mainly, vendors and consultant are considered as external parties in an information system context. In the same vein, external experts are crucial for implementing an ERP system in any organization (Markus & Tanis, 2000). According to Wang and Chen (2006), external expert possess sound knowledge, experiences and providing real-time training and guidance to the implementation of the system. Sedera et al., (2003) stated that external expert support is vital to the ERP success and this also confirmed (Wang & Chen, 2006). In general, the success of ERP and its impact can be realized when organization findsa suitable external expert who has a positive attitude, supportive mindset and corporative with management(Gefen, 2004; Ko et al., 2005).

Users Competency

An organization will be succeeded when it has a selected group of people with relevant skills, knowledge, values, and other characteristics. Yang and Guan (2004) defined AIS knowledge as essential skills and knowledge for understanding information system in an information system environment. Furthermore, they emphasized that information technology usage as knowledge assets. Azizi, (2009) stated that the main user of AIS is the Accounting manager who must possess the knowledge of office application, database, internet and email, computer application programmes and accounting. Similarly, Ang et al., (2001) defined that the accounting manager's

knowledge consists of the knowledge and experience in an information system and information technology.

Skills are the abilities of a person to carry out activities with preplanned results within the period. Daft, (2010) categorized skills into three main categories: conceptual skills, Interpersonal Skills and Technical Skills. Meanwhile, Gibson (2009) identified human skills instead of interpersonal skills in addition to the conceptual and technical skills.

Based on the definition and the dimensions of User Competency in IS mentioned above, the dimensions used to measure proposed by (Yukl, 2010; Stewart & Brown 2011) are Knowledge and Skills. As mentioned as user's competence characteristics: knowledge consists of formal education (McLeod & Shell, 2007) and having experience (Hertati&Zarkasyi, 2015), and skill consist of an ability to understand the specific assignment (Daft, 2010;Hertati&Zarkasyi, 2015). Iskandar,(2015) also used these measurements to evaluate the user's competence on quality of AIS. According to Komala (2012), categorized knowledge of accounting manager into two main areas: Knowledge and experience and it was validated significant influence on AIS and its implication impacted on AI quality by his study. Based on the definition and the dimensions of User Competency of information systems identified above, competence of users of ERP System Quality and AIQ were evaluated in this study, too. Overall, the User Competency in nutshell consists of Knowledge, Skills and Experience. This alignment needed to be researched on AIS in an ERP environment to the local context.

Internal Control System

Internal control is a routine function of an organization to make sure the operations which

are compliance with rules, law and regulation in order to meet its objectives. In other words, it is a method, policies and procedures which are set to align the function of AIS to produce AIQ to the end-user (Elder et al., 2010). Hence, the activities of the AIS process involve input , process and produce AIQ (Elder et al., 2010; Messier &Prawit, 2010; Bodnar & Hopwood, 2010).

Hsiung and Wang,(2014) stated that an organization can increase its wealth and strengthen its function when it has an ERP system which accommodates with an effective internal control system. Thus, the result of the internal control system can be realized when an ERP system equipped with proper internal control mechanism itself.Bodnar &Hoopwod, (2010) emphasized that an information system has three levels of internal control process such as input control, process control and output controls.

ERP System Quality

System quality refers to what extent the system is technically sound. System quality emphasis the effectiveness of a system which connects different areas of the operations such as data collection, reliability of the process, response times, ease of use, user involvement , completeness and accuracy of task etc.Seddon (1997) stated that system quality refers tothe interface of a system, ease of use, usefulness, performance and quality of information. It describes that when a system is technically sound it fits with all applications and user likes to work on it. In addition, Seddon (1997) emphasized that a high-quality system enhance the effectiveness of individual and organization. According to Delone & Mclean (1992, 2003) system quality measure information processing with integration, ease of use, reliability, flexibility, completeness.Drawing from a previous study (Zhang et al., 2005) validated the dimensions of flexibility, ease of use, reliability, use specific function and

timelines. As the accounting information quality included the timeliness as a dimension which is excluded in this system quality for this study.

V. Accounting Information Quality

The quality of information refers to what extent the quality of output is produced (Delone &McLean(1992). The information quality is important concerns for making a sound decision. Thus, Laudon and Laudon, (2009) stated that information quality is produced by quality of the system and also emphasized that AIQ is used for planning, controlling and operating a business effectively (Salehi et al., 2010).

Shipper and Vincent (2003) stated that AIQ is a crucial concept in accounting which consists of maintaining accounts, producing value relevance, and returns. McLeod and Schell, (2007) described that information quality has the characteristics of accurate, relevant, timely and complete. Moreover, Xu, et al., (2003) described the dimension of the information qualitywhich consists of accuracy, completeness, consistency and timeliness. All the four items used by Delone and McLean (2003) to measure accounting information quality (accuracy, relevance, timeliness, consistency and completeness) are taken as the measures in this research too.

VI. Conceptual Framework

Most studies related to AIS such as Organizational characteristics, Human character and AIS were studied in advanced industrial countries such as Europe, United States, Australia and the United Kingdom. Very few studies have been conducted on AIS in an ERP environment in developing countries. The researcher could not approach any literature in this area of research from South Asian countries, alomost nil. Thus, this study focuses initially todiscover the organizational

factor, an external factor, human factor and its relationship with AIS in ERP environment, and the impact of AIS on the firm performance, in the specific context of Sri Lankan listed companies. In this study, two theories were mainly discussed: IS Success theory and Contingency theory were used to develop the framework of this study. Conditions suitable for a specific organisation were assumed to be formed by a variety of contingencies. Accounting researchers were adopted contingency theory framework as an important basis since the year 1970 (Ismail & King 2005). However, accounting researchers focused on AIS rather than the organisational structure of the firms. Hence, contingency theory should focus on the precisefeatures of AIS which can demonstrate an appropriate matching and are associated with certain defined circumstances. It is very crucial to identify the appropriate contingent variable as they present very useful fundamental information about the factors that influence and suit AIS in an enterprise application. These variables are categorized into two major groups: organizational factors and individual factors. The organizational factors are related to organizational structure (Gerdin, 2005) which are the internal organization factors (Top Management Support, External Expert Support, Internal Control System, and Firm Performance). The individual variables refer to the factors related to some individual characteristics (User Competency) that may have effects on AISs.

The second theory was focused on IS success theory. This provides a comprehensive examination of the two information system attributes of system quality and information quality. This describes the influences ofon organizational impact. By understanding the relative importance of these IS quality attributes, management can allocate resources accordingly and thus plan for effective IS usage in the organization. This research has incorporated

DeLone and McLean (2003) IS success model.IS theory and contingency theory are mainly important in achieving organizational success. The preferred dominant contingent variables for both accounting and IS researchers include Top Management Support, External Expert Support, User Competency and Internal Control System (Iffinedo, 2011; Wang & Chen, 2006; Wu & Wang, 2006). However , the current study is focused on mainly two areas. First, it attempts to examine the influencing factors found in accounting and IS literature such as Top Management Support, External Expert Support, User Competency, and Internal Control System, AIS in ERP environment. The main idea of the present research is based DeLone and McLean's (1992, 2003) IS success theory which extends the increases in the quality dimension of IS will cause corresponding to impact on organisation success. In fact, the literature (e.g. Ifinedo et al., 2010; Wixom & Watson 2001; Hwang & Xu 2008) has shown that quality dimensions of IS are positively related to their benefits or impacts.

The literature review identified the studies by (Daoud &Triki, 2013; Wang and Chen, 2006; Ismail, 2009) who selected factors relating to the Top Management Support, External Expert Support. These factors have significant effects on accounting information systems. Moreover, AIS has significant effect by other contingency factors such as Internal Control System and User Competency (Afih&Indahwati, 2015;Fardinal, 2013; Iskandar, 2015).
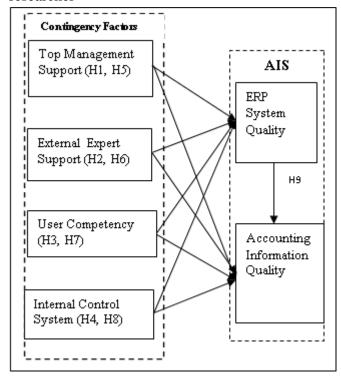
All of the previous researches suggested that further studies need to be conducted in the field of AIS and should also include many other variables. Therefore, the researcher has reviewed the previous IS success theory and contingency theory and prepared a "Mapping" in order to develop the current Conceptual Framework.The researcher reviewed the extensive study of the present

literature survey and identified the research gap and developed the following conceptual model. .

Figure 1: AIS Model in Enterprise System (AISES)

Source: Conceptual Model developed by the researcher

Hypothesis Development

6.1 Top Management Support and ERP System Quality

In connection with ERP systems, previous research stated that Top Management Support is an important determinant in implementing ERP system (Bingi et al., 1999; Somers & Nelson, 2004). Certainly, Liang et al., (2007) pointed out that top management support is completelyrelevant to the application of ERP, and also it emphasized that it leads to the ERP success (DeLone and McLean, 1992).

User participation and top management involvement in implementing a system bring sound system quality and also havesignificant effects on information quality(Guimaraes et al., 2003; Sabherwal et al., 2006).This view is

supported by De Guinea et al., (2005) who stated that top management support is associated with the use of AIS. At the same time, in the context of ERP, Wang and Chen (2006) reported that Top Management Support positively influence the ERP System Quality. Following the precedingdescription, it is expected that:

Hypothesis H1: Top Management Support influences on ERP System Quality in ERP Environment

6.2 External Expert Support and ERP System Quality

External experts are very important for ERPimplementations, as all organization do not have special experts in the same discipline to implement such a complex system (Markus & Tanis, 2000; Davenport, 2000). As noted by Markus and Tanis (2000) and Wang and Chen (2006), external experts sharing their expertise in providing training, guiding and promoting advanced solution as required by an organization. In the same vein, the organization expects supports, strong relationship, knowledge transformation and training from external experts (Markus & Tanis, 2000; Gefen, 2004; Ko et al., 2005; Westrup& Knight, 2000). Hence, Wang and Chen (2006) and Ifinedo (2008) also ascertained that support of external expertise influences the quality of the ERP system. Moreover, Ismail (2009) also confirmed that external experts contribute to the greater technical quality of the system. Thus the following hypothesis was proposed:

Hypothesis H2: External Expert influences on ERP System Quality in ERP Environment

6.3 User Competence, ERP System Quality and AIS Quality

Users of Accounting information system in ERP environment are considered accounting professionals whose role mainly considered

transaction handler, financial report provider,etc.(Chen et al., 2012). According to Tait and Vessey, (1988), if the human capital is not competent, the IS is not able to cope with companies progress. In line with this statement, Xu, (2009) stated that user who is competent as important as appropriate for IS implementation in companies. Thus Laudon and Laudon (2009) stated that an AIS would not be used without the competent human resources to align the IS. To survive and prosper of the organization, User knowledge on the information system is very important (Laudon & Laudon, 2009). Ismail, (2007) stated that knowledge of manager in sophisticated software would contribute to AIS success. Sabherwal et al., (2006) found that in the complexity of AIS environment, experienced financial managers are required to success the application of AIS.

Moreover, User Competency influence on Information quality. AL-Hiyari et al., (2013) stated that there is a significant influence by the User Competency on the accounting information system quality. Daoud and Triki, (2013) found that Users competency of information systems is an essential factor in the success of an accounting information system in the ERP system. Similarly, Afih and Indahwati (2015) concluded that User Competency influence on the quality of AIS. Based on the review of the literature, Indahwati, (2015) found that user's competency influenced the AIS quality and its implication influenced on the AIQ. Komala (2012) found that the accounting managers' knowledge significantly influences to AIS. In addition, the quality of AISs has an impact on the AIQ well. Mahdavian et al., (2016) concluded that user skills significantly influence on ERP success which is mainly categorised the quality of Information system and quality of information. Thus the following Hypotheses were posited.

Hypothesis H3: User Competency influences on ERP System Quality in ERP Environment

Hypothesis H7: User Competency influences on AIQ in ERP Environment

6.4 Internal Control System and ERP System Quality

Elder et al., (2010) and Messier and Prawit (2010) define internal control as the policies, procedure and methods which are created to give reasonable assurance to the management that the function and activities of accounting information systems are able to produce AIQ to users and storage activities by holding the input activities and processing them which results in the internal control factors influencing the accounting information system.There are many cases in companies for having a lack of commitment from top-level leadership to the lower level. And often seen in cases where weak leadership has failed to eliminate corruption, lack of supervision from management, unequal distribution of responsibilities and weak internal controls are reflected as weaknesses in the systems and procedures (Difi, 2012).

Anggadini. (2015) Stated that internal control influences the AIS quality and also besides, the AIS quality has an impact on the AIQ as well. In line with the above study Ramdany, (2015) stated that the influence of the AISs and the effectiveness of internal control have a significant effect on the financial reporting quality.The success of AIS is influenced by the effectiveness of an internal system which can assure appropriateness of processing techniques, data entry works, the accuracy of information produced and storage methods. The Internal Control System is designed to maintain the quality and security of information systems in handling activities such as input, process and output (O'Brien &Marakas, 2010). Internal control is crucial component of a computer-based accounting system to ensure the protection of corporate assets against misuse, loss and to keep the financial data of the company accurate (Jones & Rama, 2003), and it is critical

for record-keeping system and accountings system to successfully processing transactions (Millichamp& Taylor, 2008).

Results from previous studies reveal that internal control significantly influences the quality of AIS. Guan (2006) presented an important concept to implement Internal Control Systems which can help to reduce the probability or integrally protect against frauds and errors occurring in accounting information systems.

Hypothesis H4: Internal Control System influences on ERP System Quality in ERP Environment

6.5 Top Management Support and Accounting Information Quality

As mentioned in various accounting literature, it is evidenced that top management contribution created positive work attitude and enhance human capital, increase the wealth of organisation which provides training and work for effective consequences from AIS on the production of quality accounting information (Masquefa, 2008; Young & Jordan, 2008).

Accounting Information system usage is a significant factor in achieving organisationalgoals, and the user of these systems has a high level of effectiveness in their roles. Xu (2003) stated that the quality of information systems revealed that top management support is a crucial factor influencing the results. Hence, it is vital for organisations aspiring to implement good accounting information systems to have management commitment to ensure the required quality is achieved. Ismail and King (2007) stated that poor perception and knowledge of AISs among top-level leads towards declining output against the capacity of AIS. The previous study has reported that top management contribution has a remarkable impact on AIQ and also highlighted

the support is very important to the success of AIS (Al-Eqab& Ismail ,2011). So, it is proposed:

Hypothesis H5: Top Management Support influences on AIQ in ERP Environment

6.7 External Expertise supports and the AIQ

As mentioned in the literature, External expertise refers to the external consultant or vendor who provides expert support to the organization in the context of ERP implementation expertise (Ifinedo, 2008). These entities support translating an organisation's requirement into system configuration and they are actively involved in migrating the existing data and information during ERP implementation stages (Wan & Chen, 2006). Recent evidences suggested that IT developments, the support of existing IT department and external consultant have significant in IS success (Ismail & King, 2007). The quality of the information generated by the ISs is directly influenced by external expertise (Nabizadeh&Omrani, 2014). Ismail (2009) concludes that a high quality of information and results can be obtained in an effective information system with advice from external experts. Hypothesis six was posited based on this scenario.

Hypothesis H6: External Expert Support influences on AIQ in ERP Environment

6.8 Internal Control System and AIQ

Substantiated results have been presentedby prior studies on the effect of internal control on the AIQ. Study of Ronals&Houmes (2012) presented that internal control system has a significant impact on the consistency of output of accounting operation. Ge and McVay (2005) presented their finding that weak revenue recognition, period-end reports, segregation of duties and improper reconciliation were the results of a weak internal control. Weak internal control also results in low

quality of accruals and effective internal controls positively effectthe AIQ (Doyle et al., 2007).

Various users require accounting information generated from accounting data and processed through AIS to make an effective decision with reduced risk (Susanto, 2013). In line with this statement, with the aim of understanding the accounting information, it is critical to understand how transaction information is captured in the accounting system and how it is classified, recorded and reported (Wild et al., 2014). The quality of the information system can be directly impacted by the Internal Control System, and it has a direct or indirect impact on the quality of decision making. Strong commitment towards change and application of adequate internal control helps the business to be more profitable by ensuring proper control and monitoring of physical resources operations. This helps to minimise the risk appetite of the organisation and drive towards the output of credible information (Samukri, 2015). Anggadini (2015) stated that the Internal Control System influences accounting information quality through AIS quality. Therefore, H8 was proposed.

Hypothesis H8: Internal Control System influences on AIQ in ERP Environment

6.9 ERP System Quality and Accounting Information Quality

Gorla et al (2010) has reported that there is a significant relationship between system quality and information quality(Gorla et al., 2010). In consistence with thisstatement, the previous studies have supported in connection with AIS that there is no AIQ without AISquality (Sacer et al., 2006; Susanto, 2015). Hence, AISs can improve, timely deliver, speed process of transection and provide quality of financial

VIII.   Data analysis and results

statement. According to Salehi et al., (2011) the AIS Quality can improve AIQ. Further recent studies also supported the implementation of AIS effect the AIQ (Fitrios, 2016; Wisna, 2015). Previous research showed that the AIS has a significant impact on the AIQ, AIS which is able to improve the quality and accuracy of financial statements reporting (Salehi et al., 2010). Similarly, the results of research Rahayu, (2012) showed a significant impact of AIS on the quality of accounting information. Abdallah, (2013) also showed the impact of the existence of the use of AIS the quality of financial statements submitted. Gorla et al., (2010) also supported that system quality influence on information quality. Thus, it is posited:

Hypothesis H9: ERP System Quality has an impact on AIQ

VII.   Research Methodology

The data were collected through direct mail which was delivered to one top manager from the accounting or finance division of the particular firm. The questionnaire was constructed according to the five point likert scale such as (1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree and 5 = Strongly Agree) With that questionnaire invitation letter also was sent to them asking their concern to participate to the survey. This study focused 214 samples out of responses received from 265 accounting personals from quoted public companies in Sri Lanka. The sample was extracted considering the implementation of an ERP system in their organization through removing the companies from the list concerning both progress in the implementation and adoption of the ERP system. Thus, the study sample includes 214 companies.

Table1: Demographic factors

Demographic Characteristics	Frequency	Percent
Gender		

Male	208	97.2	Experience in AIS in ERP			
Female	6	2.8	Below 3 years	35	16.4
Position in the organization			3-6 years	81	37.9
Financial manager	32	15.0	6-9 years	58	27.1
Financial Accountant	49	22.9	9-12 years	24	11.2
Chief Accountant	54	25.2	above 12 years	16	7.5
Accountant	79	36.9			

Table 1 describes the demographic characteristic of the accounting personnel who directly involve in implementing AIS. A total of 214 accountants participated in this study. The majority of the participant were male 97.2% (208) of the sample and female participated 2.8% (6). The experienceof sample on AIS in ERP environment varies ranging from3 to 12 years, with 15% (32 respondents)financial manager, 22.9% (49 respondents) financial accountant , 25.2% (54 respondents) chief accountant and 36.9% (79 respondents) accountant.

IX.   Model testing- Measurement Model

All the indicators are adopted from the previous empirical studies, the structural equation modelling as well as measurement scale reliability was tested using standardized regression weight for the factor loading. Moreover, construct reliability was checked with Cronbach's alpha whichwas above 0.7 considered as satisfied for the study (DeVellis , 2003). Nevertheless, the data adequacy was checked with Kaiser-Meyer-Olkin (KMO) which was adequately confirmed for all construct and it showed that they were above 0.6 which was considered good (Kaiser and Rice, 1974). And alsoBarlett's test of sphercity statistics confirmed satisfactory result for all construct (p <0.1) which indicate that there is no multicollinearity within the variables. In addition to the EFA, confirmatory factor analysis supported to measure the unidimensionalityand to test the hypothesis of the study (Fabriger, 1999). This study was focused to run CFA using AMOS 23.0. under this structural equation modelling, the Table 2:Reliability and Validity Estimates

main important validity test that of content and construct validity (convergent and discriminant)was ascertained. To meet the objective of the study content validity was accommodated as the indicator for measuring the variables in this study through the previous literature and pilot interview with accounting professionals.

According to the Hair et al., (2010), the factor loading of the indicators of the construct should be above 0.5 which can be accepted for further analysis. In this study, all the factor loading of the indicators loaded above 0.5 and most of the factor loading of the indicators had exceeded 0.7. Hence, it could be concluded that the indicators measuring the construct were adequately validated for this study.Moreover, construct validly of the construct was tested through convergent and discriminant validly. Convergent validity is the degree to which the variable measure the latent variable. According to Hair et al., (2010), convergent validity measures the extent to which the two indicators of the same variable are correlated. The criteria to measure the convergent validity is CR should be 0.7 and greater than AVE whilst the AVE value should be greater than 0.5 as shown (CR > AVE and AVE >0.5) in table 2. Table 2 depicts that the AVE of all constructs was above 0.5, and CR> AVE. Hence, it indicates that there is a convergent validity among all constructs.The discriminant is the extentto which two conceptually similar concepts are different (Hair et al., 2010).

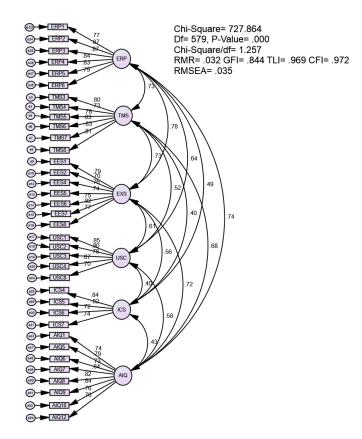| Construct	AVE	CR
Top management support	0.635	0.913
External expert support	0.579	0.906
User Competency	0.580	0.873
Internal Control	0.608	0.861
ERP system Quality	0.686	0.929
AIQ	0.619	0.928

Gakingston MS-Excel Validity Master Output

As a result of the above criteria, the standardized estimate of the factor loading is greater than 0.5 and AVE is greater than 0.5 , and CR> AVE which shows the good convergent validity of the latent constructs. Moreover, discriminantvalidity was also assessed. As it is shown in table 3, the AVE value (Diagonal Value) of the latent construct of the measurement model is greater than the corresponding squared inter construct correlation.

Figure1: Measurement Model

Chi-Square= 727.864
Df= 579, P-Value= .000
Chi-Square/df= 1.257
RMR= .032 GFI= .844 TLI= .969 CFI= .972
RMSEA= .035

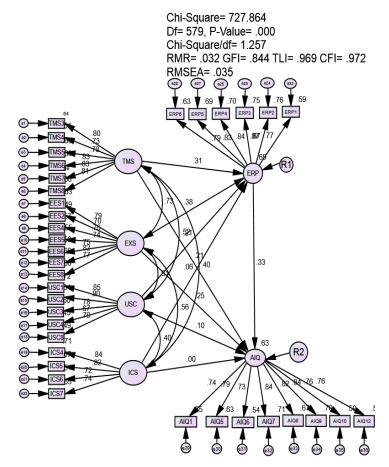|	TMS	EXS	USC	ICS	ERP	AIQ
TMS	0.635					
EXS	0.530	0.579				
USC	0.274	0.376	0.58			
ICS	0.163	0.316	0.158	0.608		
ERP	0.529	0.502	0.403	0.239	0.686	
AIQ	0.468	0.521	0.332	0.185	0.551	0.619

Table 3. Discriminant validity

Structural Equation model

Table 4: Fit Indices of Measurement Model(s) and Structural Model

Critera –Indices	Criteria	Measurement Model	Structural Model
Chi- Square		727.864	727.864
Df		579	579
Chi Square/ df	≤3	1.257	1.257
RMR	≤0.10	0.032	0.032
GFI	≥0.90	0.844	0.844
TLI	≥0.90	0.969	0.969
CFI	≥0.90	0.972	0.972
RAMSEA	≤0.05	0.035	0.035

Figure 2: Structural Equation Model

The final structural model shows good model fit. According to the indices, it shows that CMIN/df =1.257, RMR= 0.032, RMSEA= 0.035, GFI= 0.844, TLI= .969, and CFI .972. Thus, the indices of the model fit met the specified criteria.

Table 5: Summary of support for hypotheses

Proposed Path (Hypothesis)	Un. Std. Estimate	Std. Estimate	C.R / t-Statistic	p-value	Hypothesis Result

ERP <--- TMS	.358	.311	4.065	***	Supported
ERP <--- EXS	.401	.384	4.123	***	Supported
ERP <--- ICS	.068	.063	1.045	.296	Not Supported
ERP <--- USC	.297	.212	3.224	.001	Supported
AIQ <--- TMS	.216	.207	2.410	.016	Supported
AIQ <--- EXS	.237	.250	2.373	.018	Supported
AIQ <--- ERP	.299	.330	3.314	***	Supported
AIQ <--- ICS	.003	.003	.042	.967	Not Supported
AIQ <--- USC	.132	.104	1.467	.142	Not Supported

According to table 5 and figure 2, the SEM was tested to provide the relationship of the respective constructs. Hence, the structural model was revealed to test the hypothesis in accordance to find the impact of contingency factors on AIS. Four main contingency factors were identified as exogenous variables and two main dimensions of AIS were related to AIS as the endogenous variable.

Table 5 shows the relationship between contingency factors and AIS were tested by the path coefficients (estimated / Beta weight). The path from Top Management Support to ERP System Quality (β=.311, p<0.001), External Expert Support to ERP System Quality (β=.384, p<0.001), Internal Control System to ERP System Quality (β=.063 P>0.001), User Competency to ERP System Quality (β=.212, P<0.001). Again, it was tested the contingency factors with Accounting Information Quality. The Path from Top Management Support to AIQ (β=.207, P<0.005), External Expert Support to AIQ (β=.250, P<0.005), Internal Control System to The squared multiple correlations which show the variance explained by the exogenous variables was estimated. The R^2 of ERP system quality and AIQ were .690 and 6.28 respectively

AIQ (β=.0.003 P>0.005) and User Competency (β=.104, P>0.005). Finally, the test was conducted between the ERP system Quality and AIQ. The path was from ERP system Quality and AIQ (β =0.330, P<0.001).Except forthe hypothesis path from Internal control to ERP, Internal control to AIQ, User Competency toAIQ, all other hypotheses were accepted. Therefore, bothTop Management Support, External expert support influences the ERP system Quality and AIQ. Moreover, the user competency only influences the ERP system Quality but not AIQ.

Table 6: Squared Multiple Correlations: (Default model)

	Estimate
ERP	.690
AIQ	.628

Mediating Effect of ERP System Qualitybetween Contingency Factors and AIQ

Table 7: Unstandardized indirect effect

	TMS	EXS	ICS	USC
ERP	.000	.000	.000	.000
AIQ	.216	.237	.003	.132

Table 8: Indirect Effects Analysis Using 1000 Bootstrap

	95% Lower Bound				95% Upper Bound				P-value			
	TMS	EXS	ICS	USC	TMS	EXS	ICS	USC	TMS	EXS	ICS	USC
ERP	.000	.000	.000	.000	.000	.000	.000	.000	...	...	...	...
AIQ	.025	.029	-.023	.029	.222	.241	.072	.211	.009	.009	.300	.022

To test whether ERP System Quality mediates the relationship between AIQ and contingency factor (TMS,EXS,ICS,USC), the refined SEM was tested. As the unstandardised regression coefficient of the path direct relationship between AIQ and Contingency factors (.216, .237, .003, .132 respectively). Hence, the mediating effect of AIQ and contingency factor has to be tested for further decision on the indirect relationship. It is a need to see the partial mediate effects of ERP system Quality between AIQ and Contingency factors. The indirect effects were computed using AMOS. Detailed results are shown in Table 7. Further, The 95% confidence interval for the indirect effect of Contingency factors onAIQ (for TMS, EXS, ICS,USC,(lower= 0.025, upper = 0.222),(lower= 0.0.029, upper = 0.0.241),(lower= 0.-0.023, upper = 0.300),(lower= 0.029, upper = 0.211) respectively). The value of 0 does not fall within this interval for TMS, EXS, and USC except ICS. , As a result, it was determined that ERP system quality mediates (for TMS, EXS, USC P= 0.009<0.05, P=0.009<0.05, and P= 0.022<0.05 respectively) the relationship betweenContingency factor and AIQ.Therefore, hypothesis 9 for "ERP system Quality mediates the relationship between Contingency factor and AIQ" is supported for TMS, EXS, and USC except for ICS.

X. Conclusion and Recommendation

The main objective of this study was to find the determinants of contingency factors on AIS in ERP environment of the quoted listed companies which implement ERP system in Sri Lanka

empirically. The major finding of this study is that Top Management Support and External Expert Support of the contingency factors influence on ERP System Quality and AIQ. Whereas, User Competency is another contingency factor which influences only on the ERP System Quality but not with AIQ. Another significant finding of the study was that ERP System Quality has an impact on AIQ. The central research question for this study was what extent contingency factor influences on AIS in an ERP environment. Overall, thepresent study showsa significant direct or indirect effect on AIQ.

The findings in this research support the contingency factors such as Top Management Support, External Expert Support and User Competency, are determined to have a positive relationship with ERP System Quality and AIQ. It was confirmedfrom the result that Top Management Supportinfluenceson ERP System Quality in the context of ERP Environment by incorporating contingency factors to theorganisational context. With regard to the first objective, the first five hypotheses (H1 and H5) weredeveloped for Top Management Support influences on ERP System Quality and AIQ respectively. The findings of the study indicate that the path from Top Management Support to ERP System Qualityand AIQ takes a positive significant influence. The result implies that public listed companies that implemented ERP system would need more, continuous support and commitment from Top management in maintaining a higher level of system quality. The result is consistent with previous studies such as Daoud and Triki,'s (2013) who found that ERP

System Quality plays a vital role in performance organization.Carolina (2015)found that organizational culture, organizational commitment and transformational leadership significantly influence the AIS.

Moreover, Hypothesis H2 and H6, Assumes that External Expert Support influences on ERP System Quality and AIQ respectively. The results revealed that the path from External Expert Support to ERP System Qualityand AIQ have positive and significant influences. As a result, Hypothesis H2 and H6 confirmed that External Expert Support influence on ERP System Qualitywhich was in line with (Soltani et al., 2013; Ifinedo, 2008; Wang & Chen, 2006).Thus, 'organization hired external consultants 'that can provide the valuable commitment in providing training, sharing knowledge and provide continuous support to implement and use ERP system successfully. Similar findings of (Ifinedo ,2006; Wang & Chen ,2006; Ismail ,2009) also supported and confirmed the finding of the current study. Moreover, in the AIS context,'Ifinedo (2008) and Ismail, (2009)' also supported that the external expertise support influences Information quality which is impacted by IS.

Concerning the influence of User Competency on ERP System Quality, Hypothesis H3 was accepted respectively and it shows that the path from User Competency to ERP System Quality which is also significant. This finding has been previously described that User Competency affected the quality of AIS (Indahwati, 2015; Iskandar, 2015; Afiah,&Indahwati, 2015). AL-Hiyari et al., (2013) also found that there is a significant influence of the User Competency on the quality of AIS. In similarly,Napitupulu and Dalimunthe, (2015) have documented that theUser Competency of information systems, mostly operational accounting officers can improve the AIQ. Accounting people, who are competent as important as appropriate for ERP

implementation in companies, and in Complexity of ERP environment, are required to success the application of AIS. Moreover, Hypothesis H7 wasnot supported, indicating that there is a positive but statistically insignificant relationship between User Competency and AIQ. In contrast, According to Komala (2012), has documented and validated that User Competency significantly influences on AIS and its implication has an impact on AIQ.

Hypotheses H4 and H8 were not supported, indicating that there is not a statistically significant relationship between the Internal Control System and AIS. The result of this study shows that the path from the Internal Control System to AIS carries positive and statistically insignificant. Hence, the study was unable to form a relationship between the Internal Control System and AIS.Hence, the finding of this study is inconsistent with the finding obtained by previous researchers (Anggadini, 2015; Ramdany, 2015). They found a strong positive influence of Internal Control System on AIS quality. However, in anyorganisation, Internal Control System is a very strong predictor of AIS. 'A proper Internal Control System can guarantee the process of input of data, process and information generation and further to the accuracy of information produced (O'Brien &Marakas, 2010)'.According to Boediono (2012), Internal Control System is not only 'related to policies and standards of accounting, but also the activities cover more in all operation of the organization. The modern ERP system remains with its highly sophisticated system, as a result, the usage of the system perceived the values and benefits of the system. As the system covers many aspects, this may be one of the reasons for an insignificant relationship between the Internal Control System and AIQ.

XI. Recommendation

It is recommended that accounting practitioners become highly concerned and familiar with this newly developed concept because it has a direct

impact on AIS.Based on the findings, it can be recommendedthat organization should concern more attention when using ERP System in an organization. It is recommended that Top Management Support is the most crucial determinant to improve firm performance. Top managements supportsare needed to have the relevance of accounting as a system to ensure a smooth operation in the organisation. They also need to support a number ofareas such as human allocation, investment in IS in an organization. In addition, it is recommended that Top Management need to encourage the departmental participation, develop the system and policies for smooth function of the organization, maintain effective communication with employees and external experts and strengthen the relationship with external experts as well as recruit ERP personnel. It is also recommended that External Expert Support also is crucial to improveFirm Performance through AIS. Meanwhile, External Expert influence on EEP activities and also contributing to the multiple services rendered in the organization, such services areconducting requirement analysis, setting various alternatives, providing suggestion to select a suitable solution, aligning the system with organization's strategy, helping in system implementation, sharing software knowledge, and providing suitable training.

On the other hand, User Competency has directly influenced on the ERP System Quality. Although the User Competency varies on the usage of AIS in any organisation, the organization still has to pay more attention to User Competency. With the complexity of the process of AIS's requires competent staff in the AIS (skills, knowledge and experience with AIS) and AIS training (training in ERP environment), both determine the success of the application of AISs. Competencies are characteristics of a person that result in thesuperior performance of the organisation. Hence, this is another important area,organization

has to consider when they implement an ERP system.

Moreover, ERP System Quality and AIQ have directly and indirectlyimpact Accounting Practices on Firm Performance. Management should pay more attention to ERP System Quality and AIQ. It is recommended that the organization has to create sophisticated IT infrastructure which should be encouraging ERP system implementation, especially the system should be flexible, ease of use, reliable and useful for a specific function.Therefore, this is also one area organization has to consider when they implement an ERP system. Public listed companies should consider both the ERP System Quality and AIQ to implement the ERP in order to introduce more accounting applications, techniques and practices which are currently very important to face the challenges to the strategic business success.

Future research should consider the contribution of other contingency factors that may influence the AIS, such as user training, organizational structure and internal auditingr. A qualitative data collection method also needs to be undertaken for this purpose to validate the findings. A further study with more focuses to assess the organisational impact of an AIS before and after the implementation of the ERP system is highly recommended. In the future investigation, it might be possible to use a longitudinal study to gain the growing nature of AIS in rapid changes in technology. Another interesting avenue for future research is to investigate other types of private industries which may provide additional insights into the findings of this study. Moreover, the study can also be expanded to other professionals as well as other modules such as logistic management, CRM etc.to enhance the performance of the organization which in turn contributes to the development of the country.

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