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FACTORS INFLUENCING AIS CAPABILITY AND PERFORMANCE OF MALAYSIAN CO-OPERATIVES: A CONCEPTUAL FRAMEWORK

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Abstract: *Accounting information systems (AIS) capability is important because it involves the ability of AIS to process business data into useful information according to user requirements. Indeed, empirical evidences suggested that the use of AIS has positive impact on firm performance. However, factors that contribute to building AIS capability which in turn improve firm performance were not adequately explained. As such, this paper draws on the resource-based view (RBV) to define various dimensions of information systems (IS) resources. Previous studies were concentrating on small and medium-sized enterprises (SMEs) and public listed companies leaving a gap in co-operatives literatures. Also, prior studies were focusing on specific AIS capability namely enterprise resources planning (ERP) and dynamic AIS capability using dynamic capabilities framework which is dissimilar from the current study. This paper contributes to the literature by providing a better understanding of the roles of IS resources in capability-building of AIS. This paper also contributes in establishing the AIS capability-building framework within co-operatives environment in Malaysia.*

Keywords: *Accounting information systems, information systems resources, AIS capability, resource-based view, co-operative, performance*

Introduction

Today's business environment is highly competitive, which means that relevant and timely accounting information is crucial for the management in making a sound business decision. Financial opportunism, rationalization for fraud and the complex nature of business transactions (i.e. e-business transactions) is also obvious in this business environment (Prasad & Green, 2015). Thus, this situation requires sufficient AIS capability that is capable of capturing and process financial data (i.e. accounting events and activities) into useful information effectively and in a timely manner.

Accounting information systems (AIS) is defined as computer-based systems that capture and process financial data (i.e. daily transactions) into useful information for decision making (Nicolaou, 2000). Meanwhile, AIS capability refers to the ability of AIS in fulfilling the users' information requirements for decision-making (Boulianne, 2007).

Studies investigating factors influencing information systems (IS) capabilities[1] and other organisation capabilities were extensive. For example, Gu and Jung (2013) and Ravichandran and Lertwongsatien (2005) investigated the factors influencing IS capabilities. Karimi, Somers, and Bhattacherjee (2007) and Prasad and Green (2015) examined the factors influencing dynamic AIS and ERP capabilities. Meanwhile, Bhatt and Grover (2005); Chen (2012); and Ravichandran and Lertwongsatien (2005) studied the factors influencing operation capability, research and development capability, and marketing capability. However, with the exception of Karimi et al. (2007); and Prasad and Green (2015), there is lack of studies investigating the factors influencing AIS capability. Most of prior studies discussed above were conducted within public listed companies and small and medium enterprises (SMEs). We are not aware of any study conducted within co-operative environment. Indeed, co-operatives are regarded as important business entities for their substantial economic and social contribution (Harun & Mahmood, 2012). Hence, it is about time that more effort is given to study IS/AIS implementation within co-operatives.

This paper aims to develop AIS capability building framework using a resource base view (RBV) theory. The RBV regards organisations as bundles of organisational resources that include assets, capabilities, processes, firm attributes, information, and knowledge (Barney, 1991; Helfat & Peteraf, 2003). Organisations those are more effective than their rivals in selecting and deploying resources to build capabilities are more likely to gain competitive advantage (Makadok, 2001). In the context of this study, we are concentrating on IS resources in co-operatives and their roles in capability-building of AIS in improving performance.

This paper contributes to the IS research literature by exploring the roles of IS resources in capability-building of AIS. That said, this paper extending IS research in co-operatives domain. Since previous studies in IS/AIS were conducted among SMEs and listed companies, this paper aims to fill the gap by exploring the AIS implementation within co-operatives environment in Malaysia. Also this paper contributes significantly in establishing the AIS capability-building model. Considering AIS potential in assisting management function of co-operatives, the AIS capability-building model is useful for co-operatives' stakeholders be it during AIS development or implementation stage. When it concerns the former, such model could assist management of co-operatives in planning and acquiring appropriate resources. When it concerns the latter, the model could assist the management in evaluating the present resources so that improvement can be made accordingly. The researcher is not aware of any such model been developed thus far for co-operatives in particular.

The paper begins with the background of the study, followed by literature review of IS/AIS capabilities-related studies. It then discusses the RBV theory and relates it to link between IS resources and AIS capabilities. Hypotheses and the conceptual framework for AIS capabilities building in co-operatives are then proposed. The framework explains the links between IS resources and AIS capabilities, and the impact of AIS capabilities on the co-operatives' performance. A conclusion ends this paper.

[1] AIS capabilities and IS capabilities differ. IS capabilities refer to a firm's ability to deploy resources using organisational processes (Ravichandran & Lertwongsatien, 2005).

Background

Co-operatives has been highlighted by social philosophers and economists around the world as an essential mechanism for growth and development (A. Othman & Kari, 2008). This is true as cooperatives now are established in most part of the world. They can be found not only in developed countries of Canada, the United States and Europe, but also in the developing countries such as Asia, Africa and South America. The huge memberships of more than one billion people worldwide (ICA, 2013) indirectly indicates the support and confidence from world communities to the co-operative movement. In fact, Malaysia itself has more than seven million memberships which represent approximately 25% of the population (MCSC, 2013).

A review of previous studies around the globe highlights several notable issues pertaining co-operatives. First, co-operatives, particularly in Malaysia, are displaying low performance. The statistic released by the Malaysia Co-operative Society Commission (MCSC)[2] as of June 30, 2015 shows that nearly 50% of co-operatives are operating at a loss. The Malaysian government has set a target in National Co-operative Policy (NCP) 2011-2020 for co-operative sector to contribute five percent and ten percent of country's Gross Domestic Product (GDP) by 2013 and 2020 respectively. Unfortunately, co-operatives were unable to meet the five percent target of GDP contribution in 2013. The GDP contribution of the co-operatives sector was recorded only at 3.7% in 2015 (Utusan Online, 2016). With a few years before the deadline of the second target (10% of GDP contribution in 2020), this issue need to be carefully addressed by looking into ways of improving the individual co-operative performance that will directly increase the co-operatives sector GDP contribution as a whole. Therefore, the use of AIS can be an option for co-operatives to improve their performance. Indeed, a number of studies found that AIS usage contributes to organisation performance (Ismail & King, 2005b; Kharuddin, Ashhari, & Nassir, 2010; Kouser, Awan, Gul-e-Rana, & Shahzad, 2011; Salehi, Abedini, & Rasouli, 2012; Soudani, 2012).

Secondly, a paucity of study on IS/AIS implementation in co-operative environment, either locally or internationally (study of King & Shuker, 1991, is notably excluded). Although there are extensive studies around the globe on IS/AIS domain, most of those studies were limited to SMEs and listed companies (i.e. Bharadwaj, 2000; Ismail & King, 2005; Karimi et al., 2007; Kharuddin et al., 2010; Kouser et al., 2011; Ravichandran & Lertwongsatien, 2005; Salehi et al., 2012; Soudani, 2012). It appears that very limited attempts by the researchers to look into co-operatives environment. This is true as cooperative has not been a very popular research area as compared to SMEs and listed companies (A. Othman, Kari, Jani, & Hamdan, 2012).

Thirdly, although there were substantial studies investigating indirect impact of IS resources on firm performance (i.e. Bhatt & Grover, 2005; Chen, 2012; Gu & Jung, 2013; Karimi et al., 2007; Ravichandran & Lertwongsatien, 2005), limited research is conducted to investigate the link between IS resources and AIS capability and its impact on firm performance in particular. At the moment, studies in AIS-RBV were limited to examining the influence of IS resources on ERP capabilities and business process performance (Karimi et al., 2007). There are limited attempts to investigate the direct and complementary effects of IS resource on AIS

[2] MCSC is the governing body of co-operatives in Malaysia.

capability and its influence on performance. In addition, despite the importance of AIS in assisting management in decision making, there has been no published framework of AIS capability-building, particularly for co-operatives. Such framework would help the management of co-operatives in managing IS resources that are critical to AIS capability-building.

Literature Review

Business organisations are operating in dynamic and highly competitive environment which requires more accounting information on an ad hoc basis, in a timely manner, and with various levels of detail (Prasad & Green, 2015). The accounting processes are becoming complex, and capturing the accounting events and activities of the businesses is becoming increasingly challenging. Businesses are now engage with customers and suppliers using multiple channels such as traditional face-to-face and e-business transactions. This situation requires businesses with AIS capability that can accommodate these engagements.

Studies of AIS capabilities are lacking. This has resulted in limited definition of AIS capabilities available. Nevertheless, Karimi et al. (2007), in a wider scope of AIS, investigated the effect of IS resources on ERP capabilities. They define ERP capabilities in terms of ERP range, reach and geographic scope capabilities. ERP range refers to range of business processes that are shared by ERP implementation. ERP reach (or organisational scope) describes the locations that the ERP system can reach (link), such as departments, divisions, entire company, multiple companies, and so on. ERP geographic scope refers to the geographic reach of the ERP implementation, such as regional, national, and global. In another study, Prasad and Green (2015) employed dynamic capabilities framework to examine the link between organisational competencies and AIS dynamic capability. They defined AIS dynamic capability as an organization's ability to integrate, build, and reconfigure its competencies to reorganize swiftly the accounting activities and processes. This study defines AIS capability as the ability of AIS to fulfil the users' information requirements for decision-making. This definition is based on the objective of AIS which is to capture and process financial data into useful information for decision making (Nicolaou, 2000). Information is only become useful if it can meet the users' information requirements which are referred to as AIS design[3] (Boulianne, 2007).

Studies examining the relationship between IS resources and organisation capabilities were abundant. For example, Ravichandran and Lertwongsatien (2005), and Gu and Jung (2013) studied the effect of IS resources on IS capabilities; Karimi et al. (2007), and Prasad and Green (2015) examined the relationship between IS resources and ERP/dynamic AIS capabilities; and Chen (2012) investigated the influence of IT-enabled resources on organisation capabilities (i.e. operations capability, R&D capability, marketing capability). However, lack of studies (study of Karimi et al., 2007; and Prasad & Green, 2015 are notably excluded) examine the relationship between IS resources and AIS capabilities.

Karimi et al. (2007) investigated the effect of IS resources (i.e. knowledge, relationship and infrastructure) on ERP capabilities and its complementary effects on business process outcomes. They found that only relationship resource has direct effect on ERP capabilities. They also found that ERP capabilities have positive association with business process

[3] AIS design is classified in terms of scope, aggregation, integration, and timeliness (Chenhall & Morris, 1986; Ismail & King, 2005b).

outcomes. Furthermore, they found that the association of building ERP capabilities with business process outcomes is contingent on the co-presence of IS resources.

Using dynamic capabilities framework, Prasad and Green (2015) investigated the link between organisational competencies (i.e. flexible AIS, business intelligence system, and technical IT skills of accounting professionals) and AIS dynamic capability. They further examined the effect of AIS dynamic capability on accounting process performance and firm performance. They found that the three resources have significant influence on AIS dynamic capability. Also, they found that AIS dynamic capability has positive impact on firm performance through accounting process performance.

The current study however differs from Karimi et al. (2007) based on two aspects. First, the latter focus on specialised AIS (i.e. ERP system) which are intended for large firms whereas the current study is focusing on generic AIS. Second, the latter focus on large firms whereas this study is focusing on co-operatives which are dissimilar in terms of its structure and objectives. Also, the current study differs from Prasad and Green (2015) in terms of the underpinning theory applied. The former uses the RBV as the underpinning theory whereas the latter uses dynamic capabilities framework.

This study uses the RBV as the underpinning theory instead of dynamic capabilities framework because of two reasons. First, the RBV is able to explains better to the question of IS business value and competitive advantage from IS. The IS scholars in RBV studies have argued that competitive advantage from IS rests less on the level of IS investments, per se, and more on the quality of the business's IS capabilities (Stoel & Muhanna, 2008). Second, the RBV is more suitable for co-operatives environment rather than the dynamic capabilities framework. This is because co-operatives in Malaysia are known to be small and have less capital (R. Othman et al., 2016). As such, their ability to invest in IS resources is limited. On the contrary, the dynamic capabilities framework recommended that resources should be updated swiftly and be reorganised quickly to react to opportunities and threats in order to establish the dynamic capability (Prasad & Green, 2015). For that purpose, businesses are expected to allocate extra financial resources. Co-operatives, with limited capital, are very unlikely to have such ability, unfortunately.

Theoretical Framework

The Resource Based View Theory

The RBV is rooted from strategic management perspective which is used to investigate the sources of sustained competitive advantage for firms (Barney, 1991). The RBV are built upon two assumptions. First, resources are heterogeneous; in consequence, competing firms can own different bundles of resources. Second, resources are immobile; differences in resources can be subject to sustainability (Barney, 1991).

Firms are known to have various resources however, not all resources hold the potential of sustained competitive advantage. The RBV suggests that a resource must display four attributes in order to be potential source of competitive advantage (Barney, 1991). These attributes are valuable, rare, imperfectly imitable and non-substitutable. A resource is valuable when it can assist firm in formulating and implementing strategies to become more effective and efficient. A resource is considered as rare when it is scarce and not available to other competitor firm. Meanwhile, a resource that is imperfectly imitable when it is impossible for

other competitor firms to acquire. For example, a valuable resource is possessed by only a single firm. On the other hand, a non-substitutable resource refers to a resource that is difficult to replicate and exchanged with other alternatives. Firms that own valuable and rare resources could obtain short-term competitive advantage. In sustaining a long-term competitive advantage, firms must be able to safeguard their resources from replication, transfer, or substitution (Wade & Hulland, 2004).

In general, resources refer to all assets, capabilities, processes, firm attributes, information, and knowledge that are possessed by a firm that are useful to detect and respond to market opportunities and threats (Barney, 1991; Wade & Hulland, 2004). In the context of IS, IS resources refer to the combination of IT assets and IT capabilities (Aral & Weill, 2007). Aral and Weill (2007) categorised the IT assets into four categories based on the strategic purpose of respective assets. These categories include infrastructure, transactional, informational, and strategic assets. IT infrastructure provides the foundation of shared IT services (both technical and human i.e. servers, networks, laptops, helpdesk, application development etc.) used by multiple IT applications. Transactional assets intended to automate processes, cut costs, or increase the volume of business a firm can conduct per unit cost (i.e. order processing, point of sale processing, bank cash withdrawal and other repetitive transaction processing functions). Informational assets provide information for managing, accounting, reporting, and communicating internally and with customers, suppliers, and regulators. Strategic assets reposition firms in the marketplace by supporting entry into a new market or the development of new products, services, or business processes. IT capabilities, on the other hand, refer to a firm's capacity to deploy resources using organizational processes (Ravichandran & Lertwongsatien, 2005). These include technical and management skills such as programming, system analysis and design, system development and integration, budgeting and costing, and project management (Wade & Hulland, 2004).

Hypotheses and Conceptual Framework

This section outlines each of the research hypotheses depicted in research conceptual framework in Figure 1.

AIS Capability and Performance

This study posits that AIS capability has positive effect on co-operative performance. This is due to the fact that AIS with sufficient capability are able to provide valuable information. In achieving business strategic objectives and improving business performance, managers utilise accounting and other information to make decision (Prasad & Green, 2015). For this purpose, high quality accounting information is required (Ismail & King, 2005a; Kallunki, Laitinen, & Silvola, 2011). With high quality of accounting information, management are able to make good decision that would contribute to overall performance of co-operatives. Such information can be made available only if AIS in the particular businesses have the capability to capture and process business according to information requirements of the management (Ismail & King, 2005a).

Previous studies discovered that AIS capability have positive impact on performance either at firm or process level. For instance, Prasad and Green (2015) found that building dynamic AIS capability has a positive effect on firm performance. Similarly, Karimi et al. (2007), in a study of a specific AIS (i.e. ERP), found that there is a significant relationship between ERP

capabilities and business process performance. Based on the above argument, it is reasonable to expect positive relationships between AIS capability and co-operative's performance.
H1: AIS capability has a positive relationship with co-operative's performance.

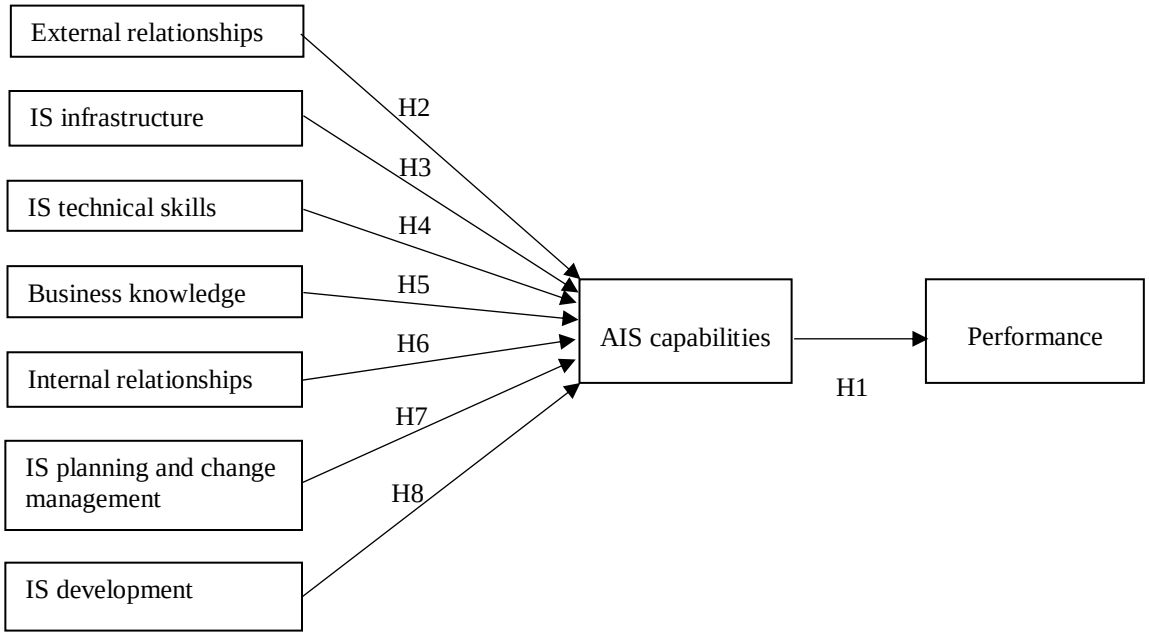

Figure 1: Conceptual Framework of AIS Capability Building

External Relationships and AIS Capability

External relationships are defined as the quality of relationships between the IS unit of co-operatives and the IS service providers (Gu & Jung, 2013). Such relationships are important especially for businesses that have limited financial and human resources. This is because they have to rely on outside partners namely IT vendors and IS service providers to develop appropriate systems and infrastructure requirements for the co-operatives (Wade & Hulland, 2004). Investment in new IS technologies including new accounting software involves financial commitment. It also requires training of manpower in charge of the particular technologies. As co-operatives are known to have limited financial and human resources (A. Othman et al., 2012), such relationships can be beneficial in assisting the co-operatives in delivering IS solutions (Ravichandran & Lertwongsatien, 2005). The technical knowledge and expertise from IT vendors and service providers can assist co-operatives in deploying those technologies effectively.

Indeed, external relationships are found to have a significant influence on IS capabilities (Gu & Jung, 2013; Ravichandran & Lertwongsatien, 2005) and firm performance (Bharadwaj, 2000; Zhang, 2007). Co-operatives intending to develop strong AIS capability will have to develop effective partnerships with vendors to tap into these resources. Hence, co-operatives with high quality of external relationships are expected to have superior AIS capability than those that do not.

H2: External relationships of a co-operative have a positive relationship with AIS capability.

IS Infrastructures and AIS Capability

IS infrastructures refer to co-operatives' shared IS assets that include hardware, software, databases, networks, and data centres (Karimi et al., 2007). They are vital in developing and building IS capabilities by assisting implementation, simplifying system integration and reducing cost of system maintenance (Ravichandran & Lertwongsatien, 2005). Empirical evidences have shown that IS infrastructures were positively influence IS capabilities (Gu & Jung, 2013; Ravichandran & Lertwongsatien, 2005).

This study postulates that IS infrastructures of co-operatives would have significant influence in AIS capability-building. This is because co-operatives with sufficient IS infrastructures are able to deploy AIS effectively. By having such IS infrastructures, AIS are able to capture and process data into information efficiently. Then, the information can be disseminated securely and efficiently using reliable network infrastructure. Hence, it is appropriate to anticipate that IS infrastructures of co-operatives have a positive effect on AIS capability.

H3: IS infrastructure of a co-operative has a positive relationship with AIS capability.

IS Technical Skills and AIS Capability

IS technical skills refer to co-operative's IS staffs technical and managerial IT skills (Bharadwaj, 2000; Chen, 2012; Wade & Hulland, 2004). These skills comprise technological competencies in new technologies (i.e. hardware and software), programming and systems development (Bharadwaj 2000). IS or AIS activities in particular are generally considered knowledge-intensive and requiring specific technical skills (Ravichandran & Lertwongsatien, 2005). This is because the persons in charge of AIS are responsible to ensure that the AIS continue to be relevant to the surrounding real-world environment. This role requires them to engage with the AIS and determine ways to reorganize the AIS so that it is able to meet the business transaction input, processing, output, and reporting requirements (Prasad & Green, 2015). Persons with such skills are well-informed on the current technology and capable to utilise and manage the knowledge. These technical skills are sophisticated and complex which are difficult to replicate (Wade & Hulland, 2004). In fact, several studies have found a significant effect of IS technical skills on IS capabilities (Gu & Jung, 2013; Ravichandran & Lertwongsatien, 2005) and firm performance (Bharadwaj, 2000). Therefore, it is reasonable to expect that co-operatives' IS staff with sufficient IS technical skills are expected to positively influence AIS capability.

H4: IS technical skills of a co-operative have a positive relationship with AIS capability.

Business Knowledge and AIS Capability

Business knowledge refers to the knowledge that the IS staffs had on various aspects of organisation which includes corporate strategy and policies, market competition, business opportunities and change management (Bhatt & Grover, 2005). Such knowledge is crucial for precise requirement analysis, data and process integration and system monitoring (Karimi et al., 2007). Deep understanding of the organisation's culture and norms is necessary to develop routines that fit the organisational context in which IS activities have to be carried out (Ravichandran & Lertwongsatien, 2005). Additionally, IS staffs with business knowledge offer a firm the ability to integrate IT strategy and business strategy, develop reliable and cost-effective systems for the business, and anticipate business needs sooner than the competitors (Bhatt & Grover, 2005). This type of knowledge cannot be replicated and

constitutes a source of competitive advantage for the firm (Barney, 1991). Therefore, it is reasonable to argue that co-operatives' IS staff with good business knowledge are better positioned to develop strong AIS capability than those that do not.

H5: Business knowledge of a co-operative has a positive relationship with AIS capability.

Internal Partnerships and AIS Capability

Internal relationships refer to the quality of the relationships between IS unit of co-operatives and other business units (Ravichandran & Lertwongsatien, 2005). Prior studies have acknowledged the importance of internal partnerships between the IS unit and other business units within the firm (i.e. Bharadwaj, 2000; Bhatt & Grover, 2005; Gu & Jung, 2013; Karimi et al., 2007; Ravichandran & Lertwongsatien, 2005). Such partnerships help to reduce the barriers that traditionally exist between units or departments resulting in superior competitive position and firm performance (Wade & Hulland, 2004). In fact, previous studies found that internal relationships has a significant effect on ERP/IS capabilities (Gu & Jung, 2013; Karimi et al., 2007; Ravichandran & Lertwongsatien, 2005). Hence, this study posits that co-operatives with high quality of internal relationships will have a positive relationship with AIS capability.

H6: Internal partnerships of a co-operative have a positive relationship with AIS capability.

IS Planning and Change Management and AIS Capability

IS planning and change management in this study refer to the capability of co-operatives to plan, manages, and utilise suitable IT infrastructure through the changes process. Such capabilities are essential for co-operatives in dealing with a rapid change of IT. With a proper IS planning, co-operatives are able to anticipate relevant changes due to the advancement in IT and the opportunities generated by emerging technologies. Key aspects of this resource include the ability to anticipate future changes and growth, to choose platforms (including hardware, network, and software standards) that can accommodate this change, and to effectively manage the resulting technology change and growth (Wade & Hulland, 2004). Moreover, prior studies found that IS planning and change management capabilities have positive effects on organizational agility (Lu & Ramamurthy, 2011) and IT support for core competencies (Ravichandran & Lertwongsatien, 2005). Therefore, this study postulates that IS planning and change management of co-operatives have positive effect on AIS capability.

H7: IS planning and change management of a co-operative have a positive relationship with AIS capability.

IS Development and AIS Capability

IS development, in this study, refers to the co-operative's ability to anticipate, assess and utilise new technology to support and enhance business objectives. In the context of co-operatives, staffs with such capabilities (i.e. experience in managing systems development) are able to provide constructive input and feedback on the development of AIS. They can act as the link between systems users and developer in ensuring the new AIS fulfils user requirements. In addition, the ability to anticipate, assess and utilise new technology would assist management in acquiring technology that suits the requirements of respective co-

operatives. Furthermore, IS development capability are found to has a significant effect on IT support for core competencies and organization agility (see i.e. Lu & Ramamurthy, 2011). Therefore, it is reasonable to expect that IS development of a co-operative has a positive relationship with AIS capability.

H8: IS development of a co-operative has a positive relationship with AIS capability.

Conclusion

A comprehensive review of literature shows that lack of studies have been conducted to investigate the effect of IS resources on AIS capability, particularly in co-operative domain. In an attempt to fill this gap, this paper proposes a framework to examine the link between IS resources and AIS capability and its impact on co-operatives' performance. The paper highlighted and discussed seven IS resources that includes external relationships; IS infrastructure; IS technical skills; business knowledge; internal relationships; IS planning and change management; and last but not least IS development. Drawing upon the RBV as the underpinning theory, eight hypotheses were proposed. Whilst the framework offers new insights into potential factors that influence AIS capability and ultimately co-operatives performance, an empirical study is undoubtedly required to validate the framework.

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