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Critical Success Factors for AIS Change: A Case Study in an Agricultural Company

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Abstract

This study investigates the critical success factors of AIS change in an agricultural company. This study adopts the case study approach in achieving its objectives. The findings of this study show that the company has adopted several strategies to ensure the upgrading of the new AIS structure was successful. Several strategies were adopted. The strategies are allocation of sufficient resources and funds, hands-on training, user participation, proper management of resistance, effective project management, top management support, use of external and internal experts, system requirement analysis, established new policies and procedures, and system migration and integration. The findings of this study serve as a guideline for business practices and contribute to the academic knowledge and literature. In addition, this study contributes to the organisational change literature as well as to practitioners in understanding the critical success factors of AIS change. Understanding such a process provides further insight and serves as guidance to companies in managing future organisational and AIS change effectively.

Keywords: Critical success factors; AIS; Organisational change; Agriculture company; Malaysia.

1. Introduction

In Malaysia, the economic policies, strategies and measures planned under its Economic Transformation Program (ETP) have a direct impact on companies in related economic areas. The government's policies under the ETP have a major impact on the stability of Malaysian companies as they are the "drivers" and "enablers" for economic growth. The expectation of the stakeholders including the government on companies under the scope of ETP is to improve their business performance. This includes the palm oil industry. The palm oil industry in Malaysia has often been described as one of the key contributors to the national economy, with the sector moving up the value chain and introducing high-end palm products. However, the current development of the industry can be described as heavily skewed towards the upstream sector, with most of the contributions coming from crude palm oil (CPO) exports (Performance Management and Delivery Unit, 2010).

The palm oil industry in Malaysia has experienced steady growth over the years particularly in upstream activities, leaving growth potential in the downstream sector under-utilised. In meeting the expectations of the government, it is expected that the companies under this industry would have experienced organisational change since they are affected by the economic policies. That is, these companies would respond and be prepared to take responsibility in strategizing ways to meet the government's expectations. One of the companies that involved in the palm oil business is ALPHA, an agricultural company. The implementation of the government policies has forced ALPHA to encounter several changes that are required for the company to become more efficient in its business functions. ALPHA has undergone major transformation such as changes in its business model and corporate structure to meet the new economic policies' expectation. This includes changes in its Accounting Information System (AIS) to become more efficient in providing accounting information in order to fulfil the demand of various stakeholders such as Bursa Malaysia, investors, the government as well as the management.

A review of the information system literature also shows that most studies have focused on identifying the critical success factors in AIS implementation (Aarabi *et al.*, 2012; Mkonya *et al.*, 2018; Supramaniam and Kuppusamy, 2010). The results of these studies provide a better understanding on the process of AIS implementation and the adoption of critical success factors during the implementation phase (Al-Ibbini, 2017; Micheni, 2017; Peter, 2017). However, most of these studies, particularly in the Malaysian context, use a questionnaire survey of a large sample of companies. Hence, there is a need for a contemporary study examining the critical success factors for AIS implementation that uses a different research approach, such as a case study. The findings of such a study would significantly contribute to the existing literature on the critical success factors of AIS implementation.

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This study therefore seeks to gain an understanding on the critical success factors of ALPHA in Malaysia. The findings of this study serve as guidelines to the practitioners in similar environments, as well as contributing new knowledge to the organisational change literature. The remainder of this paper is structured as follows. The next section reviews the related literature. The following section presents the research framework and hypotheses of this study. The subsequent section outlines the research methodology, followed by the results and discussions. The final section concludes this study.

2. Literature Review

The implementation of an organisation's AIS, or a change in its AIS structure, is not always straightforward (Grabski and Leech, 2007; Peter, 2017; Shagari *et al.*, 2017) where organisations may face various issues and challenges. In order to overcome these issues and challenges, the organisation needs to adopt control mechanisms to ensure successful implementation or transformation; that is, the outcome of the implementation can be achieved according to plan and completed within the stipulated time frame. It is also important for a company to ensure that AIS implementation costs come in within budget and, during the implementation stage, that the company's business operations can be continued without any significant interruption. Therefore, it is necessary for the company to identify and adopt critical success factors for AIS implementation.

Critical success factors can be defined as the critical areas that must go right in order for an organisation to prosper (Rockart, 1979). Adoption of critical success factors in AIS implementation is useful to organisations as these factors can provide clear guidance on which areas warrant attention and which require the allocation of sufficient resources (Shanks *et al.*, 2000). There have been many failures in AIS implementation projects for various reasons, such as cost overflow and projects not being completed on time (James, 1997; Parr *et al.*, 1999).

Failures in AIS implementation include cancelled, abandoned, re-scoped, late, or over budget projects, and failure to deliver the promised outcome (Chen *et al.*, 2009; Noudoostbeni *et al.*, 2009; Osman *et al.*, 2006). Legare (2002), found that ERP implementation failure rate is from 40 to 60%. Approximately 90% of the ERP implementations are late or over budget. The delay or over budget is attributed to poor cost management and poor schedule estimations, unplanned changes in project scope and failure in project management (Edmondson *et al.*, 1997; Holland and Light, 1999). Chen *et al.* (2009), had similar findings when they found approximately 40% of the ERP projects were classified as ERP failure and around 70% of the ERP implementation projects failed to deliver the promised outcomes. Despite the many failures, these companies still continue to implement AIS due to their essentiality in responsive planning, communication and efficiencies.

A review of the information systems literature found some studies have made an attempt to identify the critical success factors in AIS implementation (Ahmad *et al.*, 2011; Mirbagheri and Khajavi, 2013; Supramaniam and Kuppusamy, 2010). Most of the studies examining this issue reveal that a single mode of control is often not sufficient to ensure AIS implementation AIS. Instead, there must be a combination of many control modes (Grabski and Leech, 2007; Shang and Su, 2004) and these control modes may differ from one situation to another depending on the nature of the organisation (Kirsch *et al.*, 2002). Hence, it is important for an organisation to identify and adopt several critical success factors to ensure AIS implementation is successful; that is, an effective AIS structure can support a business vision, strategy and it can become one of the important functions within an organisation.

There are many reasons that could impair AIS implementation success. One of the factors is lack of top management support. A large body of the information systems literature has identified the importance of top management support as an important component of successful AIS implementation (Al-Ibbini, 2017; Ang *et al.*, 1995; Bingi *et al.*, 1999; Fitrios, 2016; Sum and Yang, 1992). The system that is highly integrated, complex in design and tedious in implementation requires the complete cooperation of employees from all levels. Hence, top management support plays an important role in order to create awareness among employees in implementing AIS. The necessary resources that top management provide in support are also important to show their commitment to the AIS implementation project (Al-Ibbini, 2017; Micheni, 2017; Mkonya *et al.*, 2018; Thong *et al.*, 1996). The AIS implementation success could be impaired if critical resources such as people, funds and equipment are not available.

Another reason that impairs AIS implementation success is resistance to change. Organisations may also face resistance from various parties such as the suppliers and employees in the process of implementing AIS. There is more resistance when the organisation attempts to upgrade the existing AIS structure, as it is compliant with the current system. The reasons for such resistance could be loss of power, low tolerance, increased work and lack of trust (Shang and Su, 2004). In particular, studies have shown that resistance to change mostly comes from the employees using the AIS (Jiang *et al.*, 2000; Joshi, 2005; Piderit, 2000; Shang and Su, 2004). Of consequence, AIS implementation becomes more complicated because consensus from all parties in an organisation is necessary to ensure that the reengineering business process can be successful by taking full advantage of the AIS (Shang and Su, 2004). These studies however, found that resistance to change is often temporary where interaction between the AIS users over time could reduce the resistance.

Lack of effective communication can also deter AIS implementation success. Communication has been widely recognised as an important component for AIS implementation success (Al-Ibbini, 2017; Allen *et al.*, 2007; Russ, 2008). Organisations must realise the importance of effective communication among various levels and functions in an organisation (Mandal and Gunasekaran, 2003). Particularly, communication must exist between the business and IT personnel (Grant, 2003; McKay *et al.*, 2010). This requires a communication plan to ensure that open communication occurs within the organisation (Kumar *et al.*, 2013). This includes the shop-floor employees (Yusuf *et al.*, 2004) and the suppliers and customers (Mabert *et al.*, 2003). Ensuring adequate communication in AIS

implementation seems imperative. However, McKay *et al.* (2010) argue that communication is not an important component of AIS implementation.

Another factor that contributes to failure in AIS implementation is poor project management (Micheni, 2017). According to Dennis (1996), project management has evolved in order to plan, coordinate and control the complex and diverse activities of modern industrial and commercial projects. Organisations need to have an effective project management strategy to control the implementation process, avoid overrun of budgets and ensure implementation within schedule. There are five major parts to project management: (1) a formal implementation plan, (2) a realistic time frame, (3) periodic project status meetings, (4) an effective project leader who is also a champion, and (5) project team members who are stakeholders. The formal project implementation plan involves the project activities, then commits personnel to those activities, and promotes organisational support by organising the implementation process. Conducting periodic project status meetings is necessary to enable each team member to report progress and problems in order to evaluate the progress of AIS implementation.

Lack of education and training among employees could also deter AIS implementation success. Education and training is the process of acquiring capability to achieve organisational goals (Mathis and Jackson, 2011). Education and training enhance the knowledge and skills of the employees by giving them new or on-going skills necessary for them to perform their work (Mahapatro, 2010). In AIS implementation, training is not only related to data entry activity, but also involves all aspects of the AIS operation as the organisations need to be restructured in order to meet system requirements (Al-Ibbini, 2017; Fitrios, 2016; O'Brien and Marakas, 2011). Education and training often involve three main phases, namely, the assessment phase, the implementation phase and the evaluation phase. At the assessment phase, the planners would determine education and training needs and subsequently, training objectives. The implementation phase is based on the results of the assessment in the first phase, whilst the final evaluation phase involves measuring how well the education and training has achieved what was expected (Mathis and Jackson, 2011; Micheni, 2017). Through education and training, resistance could also be reduced or eliminated entirely.

Shang and Su (2004), have also identified strategies that specifically focus on ensuring AIS implementation success. They combined the change management style models developed by Dunford *et al.* (1990) and Dunphy and Stace (1993). These models consist of directive, participative, consultative and coercive styles. The directive style refers to the use of managerial authority to effect change, such as providing standard documents so new procedures can be learnt easily and alter job titles to reflect increased responsibility. A participative style refers to the widespread participation by employees on the direction and process of change. This includes involving employees in the development of new systems in order to encourage a feeling of ownership and initiate morale boosting activities, such as employee gatherings. The consultative style refers to provision of information and morale support to employees. This includes providing job counselling and emotional support. Finally, the coercive style refers to forcing change on the key groups. This includes the firing or transferring of employees resistant to the changes.

Based on the factors implicated in AIS implementation failure, critical success factors can therefore be determined. Shanks *et al.* (2000), have identified 11 critical success factors for AIS implementation from the information systems literature. The critical success factors are:

i. Top management support that includes positive commitment, enthusiasm and senior management support in terms of funding for AIS implementation (Parr *et al.*, 1999).
ii. External consultants for the use of their knowledge and experience (Holland *et al.*, 1999).
iii. A balanced project team consisting of people from the information technology and business departments that have broad understanding of the business processes (Parr *et al.*, 1999).
iv. Data accuracy that includes data loaded from the existing legacy systems that must be of high quality (Parr *et al.*, 1999).
v. Clear goals that are clearly defined and well understood (Holland *et al.*, 1999).
vi. Project management that involves a detailed project plan related to the project goals Shanks *et al.* (2000).
vii. Careful attention given to change management since AIS implementation may involve changes to business processes Shanks *et al.* (2000).
viii. Education and training that involve both technical knowledge and the reference models about the AIS (Parr *et al.*, 1999).
ix. Presence of a champion that consistently advocates the benefits of the AIS (Parr *et al.*, 1999).
x. Minimising the scope of the AIS implementation and the amount of customisation and option selection (Parr *et al.*, 1999).
xi. The project team members from within the organisation are fully released from other duties during the AIS implementation so they can focus on the AIS implementation project full-time (Parr *et al.*, 1999).

In sum, effective AIS can support a business vision and strategy and increasingly become one of the important functions within an organisation. Organisations can gain enormous benefits from AIS if it is successfully implemented, but if it fails, it can be disastrous to the organisation. Therefore, organisations need to adopt critical success factors in ensuring the AIS implementation is successful.

3. Research Design
3.1. Qualitative Method and Case Study

Qualitative research is primarily exploratory research used to gain an understanding of the underlying causes, opinions, and motivations (DeFranzo, 2011). It provides insight into problems or helps develop ideas or hypotheses for potential quantitative research. The qualitative research also used to uncover trends in thoughts and opinions, and dive deeper into problems. Some common methods of data gathering in qualitative research include focus groups

(group discussions), individual interviews, and participation or observations. Sample sizes are normally small, and respondents are selected to meet specific quota (DeFranzo, 2011).

This study adopts the single-case and explanatory in an attempt to focus on understanding a phenomenon that is, in the context of this study, organisational change in the AIS within a company, ALPHA. Specifically, this study chose an explanatory case study approach in explaining the critical success factors of AIS change in an in-depth manner, particularly transformation in the AIS structure of a company due to changes in the company's status, from a private to a public listed company.

3.2. Participants and Research Instrument

This study conducts interviews where the respondents comprise of top and middle management of ALPHA. The interview approach allows this study to obtain deeper insight of the subject matter which may not be obtained through other approaches such as questionnaire survey. Fontana and Frey (2000) and Österåker (2001) argue that the interview approach in qualitative research is one of the most effective approaches to obtain truthful respondents' opinions. This method of data collection also allows the interviewees to respond with more freedom and honesty as well as providing valid information about the interviewees' views and opinions (Zoubi, 2011). In addition, the interviewees could provide more ideas for the researcher to develop and extend the interviews and subsequently, questions and directions can be adjusted to follow the new ideas (Yin, 2014).

This study chose semi-structured face-to-face interviews as a means to obtain a description of the organisational change in relation to the AIS structure of the company. In a semi-structured interview, the interviewees are provided with specified questions, but they are free to respond beyond the questions in elaborating their opinions, knowledge, experience and argument on a particular issue relevant to the questions (Schram and Steen, 2001). A semi-structured interview is chosen to facilitate the understanding and allow flexibility and hence, produce rich data (Smith, 1995).

3.3. Data Collection

Before the actual interviews, the researcher designed the semi-structured questionnaire to be used in the interviews. The design of the questionnaire was based upon the response of the interviewee during the preliminary study and a review of documents related to the company. During the actual interviews, more ideas and various themes were discussed with the interviewees and gathered by the researcher. An appointment was made with one of the officers in a managerial position of ALPHA in June 2013. This officer was chosen because he holds the position of a general manager of finance that has a vast knowledge and experience in ALPHA. The officer has been working with ALPHA before and after implementation of ETP and ALPHA listing. Emails were sent, and a series of telephone conversations were undertaken with the officer prior to the interview session. Documents stating the background of the research, the research objectives, and the contents of the questionnaire were sent to the officer before the interview session, for his easy reference. The officer agreed to be interviewed and the interview session was carried out in his office. The officer provided his opinion on the questions posed in the semi-structured questionnaire. He also expressed his views and opinions on the impact of listing on the company's business model and its corporate structure. In addition, he informed the researcher that AIS change had occurred.

The semi-structured face-to-face interviews were conducted over the period from September 2013 to April 2015. The interviews were open, interactive and conversational in nature. Permission from top management was obtained before approaching the interviewees. The interviewees were given a summary of the research objectives, contents of the questionnaire and a research approval letter by the postgraduate office before the actual interview session. Each interview session lasted between 35 minutes to 1 hour and 20 minutes, depending on the issues raised by the interviewees. Although the interview questions were posed to the interviewees in English, few of the interviewees provided their response in Bahasa Malaysia. All the interviews were tape recorded. The tape recordings made during the interview sessions were played back within two days in order to retrieve what had transpired and was discussed during the interview sessions. Any issues that needed to be clarified or that were unclear were highlighted and subsequently used to facilitate follow-up probing questions. The tape recording was later transcribed and documented. The transcription process of each interview took about four months to complete. Upon completion of transcribing the interviews, the researcher requested the interviewees to reconfirm their responses, particularly those who have responded in Bahasa Malaysia to ensure the meanings remain correct.

In total, four interviews were undertaken with four individuals in four separate visits. The respondents are the decision-makers and users in relation to AIS at ALPHA. They have also participated in developing the new systems by making decisions as well as providing feedback and responses. In qualitative research, no magic number is suggested as the appropriate sample size since it depends on the methodological and epistemological perspective of the researcher (Baker and Edwards, 2012).

4. Findings

This section presents the findings that answer the research question developed in this study that posed the question, "*What are the critical success factors adopted by ALPHA in the AIS change process?*" In the context of this study, critical success factors are the factors that positively influence the AIS implementation. It is the control mechanisms adopted by an organisation in implementing AIS to ensure the outcome of the implementation can be achieved (Grabski and Leech, 2007; Peter, 2017; Shagari *et al.*, 2017). Success in this study refers to the success of ALPHA in meeting the expected outcomes of the AIS change - that is to improve efficiencies. The discussion is based on the views of ALPHA's officers and a content analysis of relevant documents.

ALPHA has started to transform its AIS structure since the company become a public listed company in 2012. There are five newly employed systems and the existing SAP was modified to enable integration with the new systems. Several strategies were taken by ALPHA in the process of AIS transformation to ensure successful transformation. The strategies are sufficient budget allocation, hands-on training, user participation, management of resistance to change, effective project management, top management support, knowledgeable internal and external consultants, system requirement analysis, and establishment of new policies and procedures and system integration and migration.

4.1. Sufficient Budget Allocation

In realising the importance of improving efficiency in all functions and operations, ALPHA has allocated adequate financial resources to finance capital expenditure for that purpose. ALPHA raised a substantial amount of cash from the IPO in 2012. As stated in the Prospectus for the IPO, ALPHA allocated funds amounting to RM100 million (USD24 million) for the purpose of enhancing efficiency in all business functions and operations. The AIS is not an exception. ALPHA provided detailed analyses of the money spent, continuous reports and updates in management meetings, as well as the interval shareholders' presentations to maintain transparency and accountability in the transformation processes. Officer I commented on the budget allocation for the AIS project:

> As for every capital expenditure including for improve our AIS function, we need to have budget. We need to plan, we need to prepare budget, we need board approval and then only we can implement the plan. The budget must also include payment to one of the IT arm for the ALPHA group. We need also pay to the IT arm even though within the same group of companies.

Provision of a sufficient budget ensures the success of a system development and implementation. This is consistent with previous studies such as Parr *et al.* (1999) and Shanks *et al.* (2000).

4.2. Hands-on Training

In most transformation processes similar to other companies, ALPHA faced resistance from a group of people that were against the organisation plan. To overcome this issue, ALPHA has provided education and training that involves its employees at all levels providing feedback and educating and relaying the message about the transformation of the AIS structure so that everyone shares the same objectives and goals clearly. Education and training include providing management and employees with the logic and overall concepts behind the new AIS. In this way, employees can have a better understanding of their responsibility and how their jobs relate to other functions. They should be held accountable for making the system perform to expectations. Education and training is to increase the expertise and knowledge level of the people within the company. Officer B noted:

> We realised that our staff complaints on the difficulty to adapt to new systems. So, we provide training and work shop. …….. We organised continuous training and work shop which involve the decision makers, system developers and the system users. This practice helps ALPHA in ensuring the AIS implementation objective is achieved and also the resistance can be properly managed.

The findings here reveal that ALPHA provides hands-on training to its employees to assist them in overcoming the fear of failing to understand and handle the new systems. Inadequate hands-on training may lead to poor performance and be of consequence, as it would affect overall performance and be a cost to ALPHA. By providing hand-on training to employees, ALPHA believes that employees would get a better understanding of how the systems work and be more familiar with the systems. This finding is consistent with previous studies that evidence of providing hands-on training increases the performance of employees when it comes with new systems (Mahapatro, 2010).

4.3. User Participation

In ALPHA, AIS implementation post listing is not a new project. It is an upgrading of the AIS from the existing AIS structure. However, ALPHA still treats this upgrading effort as a new project and a strategic investment that requires the effort, support and attention of all employees. Therefore, the employees that are the users of the system are encouraged to participate in the development and implementation of the systems.

Users' or employees' participation is an important element in the system development and implementation since they are later on directly using the systems. They need to be comfortable and happy with the systems features and functions. Furthermore, the employees themselves may feel that they should be the people who choose and make the decisions in system development and implementation. In involving the employees, ALPHA encourages user involvement when the company decides to implement the new system in the early stage of implementation as well as during the implementation of the systems. A period of transition is also provided during which the employees are allowed to cope with the differences between the old and the new systems. Officer C noted:

> We do realise the importance of getting our employees to be receptive of the systems in our company. To start with, we carefully select the right employees with the right skill set. This would increase the confidence and get the employees to contribute also to the development and implementation of the systems. Yes, we know that internal resources of a company do not mean experts only in the company's processes but should also be aware of the knowledge of information systems application in the industry.

`The employees can provide feedback about the systems and subsequently, improve the use of the systems in their activities and increase performance. The findings in this study are consistent with previous studies that provide evidence of the importance of user participation in system development and implementation (Kumar *et al.*, 2013;

Shang and Su, 2004).

4.4. Management of Resistance to Change

At the early stage when the systems were being implemented, ALPHA did face some resistance from employees. Based on an interview with the officers in ALPHA, this study shows that over time the employees' resistance to change was slowly reduced and eliminated through the education, training and user involvement in the implementation of AIS changes, as employees started to understand and appreciate the benefits of the new AIS structure. The management of ALPHA has also used the power of the head of department to excerpt influence and manage the resistance. As noted by Officer D:

> *There always be resistant but that's why we need to engage and train them (staffs). That's why we need to communicate. As a human being who has been in the company for a quite sometimes, they are in the comfort zone. However, we need to adopt effective change management program (to overcome this issue). It is a formal change program. We have to train and meet with them to relay the message of change. Over time they can accept the changes and become users of the system.*

Officer A also commented on managing resistance:

> *We also facing resistance but that's normal for any changes to be make. Before this we don't have the new systems. Once we plan to employ the new systems, people are initially resisted and sceptical to the systems. I think nowadays, everywhere and everyone used IT. People re-act and easy understand the benefits of IT. Actually, resistance from our people not on the benefits of IT but resistance happen for process of the new systems and that normal and happen anywhere. If we manage it well, should be no problem*

ALPHA also realised that involving its employees at the stage of assessing the AIS needs is beneficial since failing to understand the systems may lead to resistance to change and using the new systems. Based on this finding, the present study shows that ALPHA has used the change management model in overcoming resistance to change. This includes rewarding ideas that would improve throughput and allow employees to have a key role in the AIS implementation. Officer C commented:

> *Some of the system that we already used and some of them are still in the developing stage. Normally, after being use, the staffs give their feedbacks as the system itself is been part of their duty and daily work process. They need to use the system daily and over time, no more resistance.*

This is consistent with previous studies that examine strategies in overcoming resistance to change (Dunphy and Stace, 1993; Jiang *et al.*, 2000; Judson, 1991).

4.5. Effective Project Management

ALPHA also realised the importance of having effective project management and coordination among its various functions. ALPHA has set up a coordination plan to ensure that open and transparent communication and workflow occurs within the entire organisation, including all level employees, suppliers and consultants. In addition, ALPHA has also taken appropriate measures to ensure effective project coordination and management. As noted by Officer B:

> *We have formed an implementation committee. The team members are among the head of division which will be the right person to know and address their respective division's issues pertaining to the AIS system requirement. Through this committee, the upgrading process can be easily coordinated and managed.*

Coordination and communication between functions in ALPHA especially between the business function and IT personnel is important to ensure that there is no communication breakdown that may affect the progress of AIS implementation. This is consistent with Allen *et al.* (2007) and Russ (2008) that shows the lack of communication ultimately affects the performance of a company.

4.6. Top Management Support

One of the critical success factors for AIS implementation found in this study is top management support that comprises board of directors, CEO and heads of departments. In ALPHA, new systems were initiated by the CEO. Top management support was clearly existed during the AIS implementation at ALPHA. In addition, ALPHA has also established a special task force or implementation committee to manage and supervise the progress of AIS implementation. The top management also selected the right personnel who were qualified to be in the special task force. The Task Force Committee is exempted from their routine duties so that they can focus on the development of AIS to ensure implementation success of the AIS structure.

Since the existing system adopted is a highly integrated information system, its design, implementation, and operation require the complete cooperation of the employees from all functions of the company. ALPHA realises the importance of having top management support in order to play a role in settling disputes and in providing clear solutions to any doubts. This study shows that the top management of ALPHA is willing to provide the necessary resources to systems development and implementation. It shows that AIS change project in ALPHA was a top down instruction as indicated by top management providing support to the AIS upgrading process. Any issues pertaining to AIS implementation were deliberated in a management committee meeting. Officer D explained management support in the transformation process of AIS at ALPHA:

> *Actually, the top management of the group is a responsible party in developing of the new system. Who are the top management? The top management is referring to those with the chief title, CEO,*

CFO, COO, CHRO and CIO. We have management committee meeting to discuss anything including the requirement for a new system. Discussion would be either with group CEO or in the management committee meeting and it is always involved the internal consultant.

The finding in this study is consistent with previous studies that top management support is one of the critical success factors for system development and implementation (Ahmad *et al.*, 2011; Mirbagheri and Khajavi, 2013; Noudoostbeni *et al.*, 2009; Osman *et al.*, 2006; Supramaniam and Kuppusamy, 2010).

4.7. Knowledgeable Internal and External Consultants

One of the advantages that ALPHA has is the availability of internal and external experts responsible in ensuring that the AIS implementation is successful. The internal and external experts consist of the IT department, headed by the Chief Information Officer, internal consultant, and the external consultant. The joint efforts of these internal and external experts provide better outcomes for AIS implementation. ALPHA has employed the existing system since the year 2004 and every improvement to the AIS structure needs to get the vendor's recommendation in ensuring the existing system is still relevant and able to integrate with the new systems. Hence, it is important to hire vendors with knowledge in both business processes and system functions. The consultants should also possess good interpersonal skills and be able to work with people. The software vendors should also be carefully selected since they play a crucial part in shaping the ultimate outcome of the implementation. Officer A explained the involvement of consultants in AIS implementation:

ALPHA has an IT arm which is one of its subsidiaries to advice on every AIS project. Even though we employed external consultants for system development, but it still needs to go through the IT arm.

Officer C further noted:

We realised that our staff's complaint on the difficulty to adapt to new systems. So, we provide training and work shop. We hired consultants to help. We have our internal consultant and we also hired external consultants.

Hiring appropriate vendors and consultants would help the process of system implementation become more efficient and effective. The finding here is consistent with Parr *et al.* (1999) and Holland *et al.* (1999).

4.8. System Requirement Analysis

Several business functions of ALPHA are unique such as the trading and marketing of the commodities function which also involves the futures market. Therefore, management has to perform systems requirements analysis properly before a new system is selected. The new system should closely fit the existing system and requirements. Officer A commented:

SAP is a system managing general ledger, costing, budgeting, payable and receivable account. It is a financial system. We must manage our finance and must have our own finance system. Off-course SAP ERP was deployed in every company in ALPHA except for companies newly acquired which are not using SAP for their financial record. For example, our newly acquired company where they have their own system other than SAP. Later on, we need to integrate with SAP if possible. However, integration process between different systems is sometimes easy and sometimes a bit difficult.

To alleviate the problems, ALPHA has conducted a system requirements analysis to identify the problems that need to be solved before deciding on the systems and selecting the new systems that best fit their requirements. The software and hardware selected should be fitted to the SAP specific requirements as a main system. Officer A commented on the integration of existing SAP with the new AIS systems:

We have set up architecture team to study and review the possibility of integration. How it's should be integrated among the system. We know the systems must be integrated eventually. Since we are growing, and we acquire many new companies, integration issues become critical for us now. We treat the integration issue as normal issue, and everyone is ready for the changes. Therefore, to ensure we tackle this issue properly, we have set up our architecture team to oversee the overall landscapes and the possibility of integration between systems. They have to ensure the integration to be correctly done and will make decision whether to maintain the existing system or to deploy new system.

The finding here shows the importance of identifying the problems related to system integration and migration. This is consistent with studies by Edmondson *et al.* (1997) and Holland and Light (1999).

4.9. Establishment of New Policies and Procedures

ALPHA has established new policies and procedures for the new systems. This is to ensure the availability of reference resources and to streamline the business process. This serves as the referral point of the employees running the system as they can refer to the policies and procedures should there be any technical problems. As noted by Officer D:

Number of procedures need to be changed after implement of the new systems and many things will also be changed including daily process and it is a permanent change. For example, reporting process was changed with Online KPI and therefore, related daily processes were also changed.

The establishment of new policies and procedures in ensuring the successful implementation of AIS at ALPHA is consistent with the findings of previous studies that show the importance of having these documents as a source of

reference (Shang and Su, 2004).

4.10. System Migration and Integration

In 2010, ALPHA took over a few companies that have an AIS structure somewhat different to the systems used in ALPHA. To ensure that issues related to system migration and integration would not escalate, ALPHA took the necessary actions to ensure that business activities could continue without major interruption, avoid data loss and incurring unnecessary costs. ALPHA set up a special task force to evaluate the existing system's effectiveness in the newly acquired companies. The special task force would then provide advice and report on whether the existing systems can be used and integrated to the AIS structure in ALPHA. At the end of the evaluation, the team would provide suggestions to the top management of ALPHA on whether the existing systems should be replaced with new systems. Officer B commented on the integration of the existing SAP with the new AIS:

> For example, our newly acquired company where they have their own system other than SAP. Later on, we need to integrate with SAP if possible. However, integration process between different systems is sometimes easy and sometimes a bit difficult. We have set up architecture team to study and review the possibility of integration. How it's should be integrated among the system. We know the systems must be integrated eventually. Since we are growing, and we acquire many new companies, integration issues become critical for us now. We treat the integration issue as normal issue, and everyone is ready for the changes.

As also noted by Officer C:

> SAP is our main system that process raw data. When the new systems employed, we need to ensure integration between these systems. Modification on the SAP will be continuously done to ensure raw data from the SAP can be easily trace and readable by the new systems and related procedures and daily process were also change because the new systems.

In sum, the main reason for ALPHA upgrading its existing AIS structure is to raise efficiency in information dissemination. It was anticipated that from the new AIS structure, financial data could be prepared correctly and delivered on a timely basis. However, in the AIS change process, the company normally faced various issues and challenges including resistance from staff that led to AIS implementation delay or failure. Adoption of critical success factors in pre, during and post implementation could warrant the AIS transformation success.

4.11. Discussions on Critical Success Factors of AIS Implementation

Table 1 provides a comparison of the findings of this study with other studies that have examined critical success factors for AIS implementation in a Malaysian setting. It is interesting to analyse and compare the findings of these related to the changes to the AIS in the present study, as this provides further understanding of the critical success factors for AIS change that improve overall organisational performance. Also, it contributes to the literature on critical success factors for AIS implementation, particularly in Malaysia. There are 19 critical success factors as identified and compared in Table 1.

Referring to Table 1, this study used an interview approach with the participants who are officers at ALPHA. Using the interview approach can provide a better understanding of the process of organisational change in a company and hence, obtains better insights on the importance of the critical success factors for organisational change success. Other studies on the other hand, have examined critical success factors relying on the questionnaire survey. For example, Osman *et al.* (2006), Supramaniam and Kuppusamy (2010), and Ahmad *et al.* (2011) examined the implementation of the AIS in public listed companies by using a questionnaire survey, whilst Noudoostbeni *et al.* (2009) and Mirbagheri and Khajavi (2013) used a questionnaire survey on SMEs in Malaysia.

Table-1. Comparison with Previous Studies on CSF to AIS Change in Malaysia

Author		Osman et al.	Noudoostbeni et al.	Supramaniam and Kuppusamy	Ahmad et al.	Mirbagheri and Khajavi	Present study
Year		2006	2009	2010	2011	2013	2017
Nature of Company		Public listed	SMEs	Public listed	Public listed	SMEs	GLC and Public listed
N		50	10	151	50	94	1
Research Methodology							
1	Questionnaire survey	/	/	/	/	/	
2	Interview						/
Key Success factors							
1	Top management support	/	/	/	/	/	/
2	Clear goals and objectives	/	/	/	/	/	/
3	Effective communication and Training	/	/	/	/	/	/
4	Effective project management	/	/	/	/	/	/
5	Clear business process reengineering	/		/	/	/	/
6	Right and good support from vendor	/	/	/		/	/
8	Dedicated resources and Committee		/	/	/	/	/
7	Users involvement	/		/		/	/
9	Minimal customisation, Integration and Legacy IT System	/		/		/	/
10	Set up quality assurance team (QA)				/		/
11	Group and self-service structure		/			/	
12	Another departments' participation		/			/	
13	Cultural fit to organisation					/	
14	Looking ERP as strategic investment					/	/
15	Handle resistance of organisation to change					/	/
16	Effective decision-making		/	/			
17	MIS department and proper reporting					/	/
18	Specific architecture team for systems within newly acquired company						/
19	External, internal consultant and IT department						/

Table 1 also shows the number of critical success factors to AIS change for organisations in Malaysia. For example, Osman *et al.* (2006) found eight critical success factors for AIS change. Mirbagheri and Khajavi (2013) examined organisational change on the AIS using a questionnaire survey on 94 SMEs in Malaysia. Their study managed to identify 15 critical success factors to AIS change. While comparing the findings of present study with the findings of previous studies, it can be seen the critical success factors in the present study are somewhat different from the findings in previous studies. For example, although the number of identified critical success factors in the present study is the same as that for Mirbagheri and Khajavi (2013), here additional evidences are provided - the importance of hiring internal and external consultants and the establishment of architecture team to evaluate the suitability of the existing systems in the newly acquired companies.

Another example is in Noudoostbeni *et al.* (2009) and Mirbagheri and Khajavi (2013) studies, they found group and self-service structures and other departments' participation are among the critical success factors for AIS change. However, in this study, these two factors are not existed as critical success factors.

The difference in critical success factors between present study and previous studies could be due to the characteristics of the company. For example: Mirbagheri and Khajavi (2013) relied on SMEs whilst present study used a new public listed company that had acquired several new companies. Another reason for the differences could be due to variations in business activities between the samples. For example, Mirbagheri and Khajavi (2013) study was on manufacturing SMEs while the present study uses an agricultural company as the sample.

Overall, the first nine critical success factors that exist in all studies including the present study are as stated in the Table 1: top management support, clear goals and objective, effective communication/training, effective project management, clear business process reengineering, right and good support from vendors, dedicated resources and committee, users' involvement and minimal customisation or integration or legacy IT system. Therefore, this study suggests that these nine factors are important and should be employed in future AIS projects. The other ten critical success factors are also important in building the organisation's AIS structures, although they are not included in the first nine factors. This may be due to merging two or three factors into a single category. For example, dedicated resources, a committee and top management support are categorized under top management support (Holland *et al.*, 1999; Parr *et al.*, 1999). Another example, setting up quality assurance team (QA), selection of dedicated resources and committee, and establishment of MIS department and proper reporting progress are all might be combined into effective project management. In addition, minimal customization, integration and legacy IT, and establishment of system specific architecture team for systems within newly acquired company could be combined into System Migration and Integration.

5. Conclusion

This study investigates the critical success factors of AIS change in an agricultural company known as APLHA. ALPHA has adopted several strategies to ensure the upgrading of the new AIS structure was successful. Among the strategies are allocation of sufficient resources and funds, hands-on training, user participation, proper management of resistance, effective project management, top management support, use of external and internal experts, system requirement analysis, established new policies and procedures, and system migration and integration. This study also provides the lists of critical success factors in AIS implementation. The lists can be referred to by other companies in deciding the best strategies to be adopted. This study contributes to the organisational change literature as well as to practitioners in understanding the critical success factors of AIS change. Understanding such a process provides further insight and serves as guidance to companies in managing future organisational and AIS change effectively.

This study is not without limitations. Firstly, there is a possibility of participant bias that may influence the findings of this study. The data collection was conducted through semi structured interviews with the officers in ALPHA. These officers were mainly those who were direct users of the AIS in ALPHA. Other than these officers, there were no interviewees representing other stakeholders, such as the employees from the other departments or business units. Of consequence, this may cause the analyses and discussion of this case study to be highly contextual in nature and potentially leads to a degree of biasness. Hence, the response obtained from the interviewees in this study could not represent the views of other stakeholders of the company. In this study however, the biasness is controlled through triangulation of multiple evidences collected through content analysis and interviews Secondly, all research irrespective of whether conducted using qualitative or quantitative methodological paradigm will bear the risk of data validity and reliability unless appropriate research methods are adopted and that in this study, an appropriate research method such as data triangulation has been adopted which has enhanced the validity and reliability of data collection and analyses. In other words, this study has relied on two main ways in order to obtain valid and reliable empirical evidence.

Acknowledgments

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