KNOWLEDGE INTEGRATION MECHANISM AS MEDIATOR BETWEEN LEADERSHIP STYLES AND ENTERPRISE SYSTEMS SUCCESS

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UNIVERSITI TEKNOLOGI MALAYSIA
KNOWLEDGE INTEGRATION MECHANISM AS MEDIATOR BETWEEN
LEADERSHIP STYLES AND ENTERPRISE SYSTEMS SUCCESS

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A thesis submitted in fulfilment of the
requirements for the award of the degree of
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Faculty of Computing
Universiti Teknologi Malaysia

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Dedicated to:

My parents Haji Ghazali bin Haji Kasim and Hajah Zaiton binti Haji Muda
My parents-in-law Haji Alias bin Said and Hajah Anang binti Jusoh
My husband Sabaahul Ahmad bin Haji Alias
My sons and daughter:
Ammar Syafiq, Aiman Syakir, Amir Safwan and Aleesya Maisarah.

Thank you for your prayers, understanding, unconditional love and support!
ACKNOWLEDGEMENT

Bismillah ir-Rahman ir-Rahim…

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ABSTRACT

Many organisations in developing countries invest huge amounts of capital in Enterprise Systems (ES), with the intention to gain all the benefits offered by such systems. Unfortunately, the failure rate of ES implementation in developing countries is high. According to a systematic literature review of research on ES critical success factors, 100 percent of these failures occur due to the lack of management or leadership support and commitment, particularly in the ES post-implementation phase. Many studies in the literature also report the power of Knowledge Management (KM) to assist organisational superiors in ES post-implementation phase. These studies highlight the capability of one of the most neglected KM processes, namely, Knowledge Integration (KI), and explore the crucial involvement of organisational superiors with different leadership styles (such as transformational and transactional) in the ES post-implementation phase through the employment of quantitative research methods. The present study commenced with an intensive literature review, and a series of interviews with company experts in order to identify the research gap and confirm the validity and reliability of the constructs in the developed survey. A total of 508 valid survey responses were analysed using the Partial Least Squares-Structural Equation Modelling (PLS-SEM) approach. Mediating effect tests were performed using bootstrapping procedures to test the role of KI mechanisms as a mediator. The results indicate that KI mechanisms fully mediate the relationship between transactional leadership style and ES success. Conversely, KI mechanisms partially mediate the relationship of transformational leadership style and ES success. The results expose the importance of the both leadership styles and superiors’ adoption of KI mechanisms when managing the ES in the post-implementation phase and highlighted the leadership practices and the mechanisms of KI that should be prioritised during the ES post-implementation phase.
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Assessment of validity and collinearity for formative measurement model

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Average variance extracted

Indicators’ cross-loading values

Redundancy analysis of transformational leadership constructs

Redundancy analysis of transactional leadership construct

Redundancy analysis of ES success construct

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Leadership styles model towards ES success

KI as Mediator between Leadership Styles towards ES Success

Composite reliability result

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LIST OF SYMBOLS

$\alpha$ - Probability of Type I error
$R^2$ - Coefficient of Determination
$f^2$ - Effect Size
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CHAPTER 1

INTRODUCTION

1.1 Overview

This research empirically shows the involvement of knowledge integration (KI) as a mechanism to mediate between leadership styles and enterprise systems (ES) success. This chapter gives an overall overview of the research. The relevant issues briefly described in order to explain the motivation for the research (Section 1.3). From this background, the problem statement derived and articulates the research questions (Section 1.5). Next, the study's objectives are stated (Section 1.6) and point out its significance (Section 1.7). The scope of the research is outlined (Section 1.8) and illustrate the research strategy. Finally, the entire chapter is concluded with a brief summary (Section 1.9). Table 1.1 illustrates the overview of this chapter.
Table 1.1: Organisation of Chapter 1

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1.2 Key Definition

In this section, the definitions of important terms for the thesis are defined as below:

ES
Integrated, meticulous real-time application-software that organisations use to handle more than one task, in order to facilitate its daily operations and management reporting.
ES post-implementation phase

The production phase of ES usage in an organisation’s daily operation. This phase involves the organisation of processes for adapting and re-aligning process, structure and culture, in order to utilise the ES environment and manage the knowledge ES produces.

Leader

A person with special qualities, and who is capable of leading, controlling and influencing people towards the achievement of goals.

Leadership

The distinctive characteristics or qualities that a leader or a superior should have.

Manager

A person who responsible for administering an organisation’s affairs, and has the authority to control the people under his or her supervision.

Superior

A person in an organisation who holds a dominant or higher rank of position within its field than another, and who has authority to control people under his or her supervision. In this study, the term ‘superior’ is used to refer to senior managers, managers and supervisors. The ‘superior’ is the subject investigated in this study.

Transformational leadership

A type of leadership style where the superior is charged with identifying a needed change, creating a vision to guide the change through inspiration, and executing the change with committed workers. The superior is generally energetic, enthusiastic, and passionate. He or she is responsible for and participates in the activity, and is focused on helping his or her workers to succeed as well.
Transactional leadership
A type of leadership style where the superior focuses on the roles of supervision, organisation, and group performance. The superior promotes the compliance of his or her workers through both rewards and punishments.

KI
The process of transferring, sharing, combining and synthesising individuals’ knowledge to create meaningful knowledge for other individuals or groups, which can benefit the organisation.

KI mechanism
A process, technique or system use to integrate knowledge, which may involve a particular strategy or approach to its accomplishment, for instance group discussions, training, and/or brainstorming sessions.

1.3 Research Motivation

Many contemporary organisations are struggling to maintain their ES in the post-implementation phase (Chou et al., 2014; Ahmad and Cuenca, 2013). As postulated by many studies, the complex characteristics of the ES mean that a powerful tool is required to manage the ES post-implementation phase. This phase involves a number of critical and ongoing tasks such as conducting maintenance activities, aligning business processes with the newly installed system, streamlining the decision-making process and training workers. Therefore, researchers have stated that the implementation of knowledge management (KM) along with the ES is essential (Vandaie, 2008; Tsai et al., 2011; Kumar and Gupta, 2012a; Teittinen et al., 2013; Yeh and Xu, 2013; Chou et al., 2014). KM has been used in brainstorming
sessions, meetings and training and also in solving problems in maintenance activities. Implementing KM in daily tasks also could save organisations money, as all the crucial tasks are able to be handled internally by experienced workers (Grant, 1996a, 1996b; Sedera and Gable, 2010; Yuena et al., 2012).

ES are complex application systems which are mingled with various processes, modules and fields of expertise. The KM process, including knowledge sharing, knowledge transfer, knowledge creation and KI, must be nurtured in organisations in order to produce knowledgeable workers so that managing the complexity of the ES is not a barrier. In addition, the positive effect of nurturing KM in the organisation could ensure the ES business process operates as scheduled, and that the maintenance worker can handle the problems easily without any delay to the main process. KM practices can also help to reduce training costs as the KM processes are already used by leaders in their daily tasks (e.g. brainstorming sessions, training, intellectual symposiums) (Grant, 1996a; Haddad, 2008; Enberg, 2012; Vie, 2012). KI consist the processes of transferring, sharing, combining and synthesising individual’s knowledge in order to create a beneficial or meaningful knowledge to others. The lack of KM practices, particularly KI, in an organisation could cause set-backs in ES implementation, especially in the ES post-implementation phase (Enberg, 2012).

The leader or superior—as the person responsible for ensuring that the organisation’s goals and objectives are achievable—should take an active role in ES survival (Zhu et al., 2010). However, superiors need special mechanisms to pursue the organisational goals, especially while managing the chaos of the ES post-implementation phase which usually involves aligning the new system with the business process, carrying out maintenance activities, educating and training workers, forecasting, decision-making and managing risks (Newell et al., 2004; Haddad, 2008; Lopez and Esteves, 2009; Pries-Heje and Dittrich, 2009). By failing to pay proper attention to the ES post-implementation phase, and especially by disregarding KI mechanism, the superiors can cause a great loss to the organisation (Grant, 1996a). KI mechanism involves the process or the techniques or the system that use to integrate knowledge which may need a particular strategy or approach to accomplish.
The consequences of not nurturing KI practices among ES workers can cause a range of problems in the ES post-implementation phase such as operational delays, cost overruns, a mismatch with the business process (e.g. the ES does not support a newly-added business process due to insufficient knowledge of the ES modules or programming), lack of motivation to use the ES, untrained ES workers, and misjudgements by management. The organisation could experience a great loss due to no well-train workers to operate certain module because the migration of skilful workers from the organisation (i.e. cause of ‘brain drain’-loss of skill and well-trained workers). Nevertheless, leadership with a variety of management styles can contribute to ES success by effectively managing the complexity of ES knowledge in the ES post-implementation phase (Cho et al., 2011).

Although there are some studies in the literature that emphasise the crucial need for superiors to nurture and use KI mechanism to manage the ES post-implementation phase, no studies have presented empirical evidence on the importance of the role of KI mechanism in the ES post-implementation phase, especially in relation to its management by different leadership styles.

Therefore, this study attempts to fill the gap in knowledge and practice by gathering the empirical evidence on the importance of KI mechanism in ES success, particularly in the post-implementation phase. This study also empirically investigates the influence of leadership styles on the use of KI mechanism towards ES success. Accordingly, a theoretical model of KI as a mediator between different leadership styles and ES success is developed as a tool in our research. Although there is a study by Cho et al. (2011) that presents a model of the effect of transformational leadership on information systems success, the model does not address KI as a mediator. Moreover, we take into account the role of other leadership styles such as the transactional leadership style. Thus, as far as we are aware, the proposed model is the first effort to empirically investigate leadership styles, in particular the transformational and transactional leadership styles, and the need to adopt KI in the ES post-implementation phase.
1.4 Problem Statement Development

Based on the guidelines proposed by Blum and Preiss (2005), we develop the problem statement through the following six steps

a) identify and select a problem
b) define the problem

These two steps, we reflect on the investigated research problems (eg., the problem is…what...for who.. where).

c) determine the research design
   This step determines types of design (quantitative, qualitative), will do what (explore, describe) what (topic) by doing what (interviewing, observing) who (subjects or population) where (location).

d) state the relevance
   This step create the problem statement derived from step a until step c.

e) cite research
   This step involves the citing relevant research.

f) share the checklist.
   This final step of problem statement development is sharing the problem statement with the community (e.g., lecturers, officers from the companies related with the research, other researchers).

1.4.1 Step 1 and Step 2 – Identify and Define the Problem

As indicated above in the brief discussion (Section 1.3), KI is a suitable mechanism for coping with the difficulties of the ES post-implementation phase. Operational delays, cost overruns, the mismatch with business process, unmotivated workers, untrained workers and
leadership misjudgements are among the many consequences that occur due to the lack of integrated knowledge among workers or ES team members. These problems can, in turn, lead to other major problems in the organisation, such as decreased production, financial problems, migration of knowledgeable workers/expertise to other companies and bankruptcy. The problem statement in the present research is therefore articulated as follows:

No empirical research has been conducted to gather evidence on the use of KI mechanisms to facilitate superiors in the ES post-implementation phase.

The next section explains the research design used to investigate the problem.

1.4.2 Step 3 – Select the Research Design

Departing from our problem definition, we employ a quantitative study design to empirically explore the role of KI in the ES post-implementation phase and the adoption of KI mechanisms by organisational superiors. This quantitative study analyses data gathered from private and government sector organisations which were in the adoption stage of ES (i.e. using an ES for more than 1 year). The next section discusses the relevance of the research in the context of the potential benefits of its results.

1.4.3 Step 4 – Determining Relevance

The problem addressed in this study is that no empirical research has been conducted to gather evidence on the use of KI mechanisms by organisational superiors in the ES post-implementation phase. Thus, we employ a quantitative study design to empirically explore the role of KI in the ES post-implementation phase with a particular focus on the adoption of
KI practices by organisational superiors. This quantitative study analyses data gathered from private and government sector organisations which were in the adoption stage of ES (i.e. using an ES for more than 1 year). It is expected that the findings will help to promote successful leadership strategies and KI practices in the ES post-implementation phase, which will be beneficial to organisations which have made huge investments in ES implementation.

The next section identifies the theories and cites the research that is relevant to the problem and validates the need for the study.

1.4.4 Step 5 – Cite Research

The most relevant literature to the problems and situations of the study: Grant (1996b, 1996a); Newell et al. (2004); Gable (2008); Sedera and Gable (2010). Consequently, we verify our problem statement according to the checklist as described in the next section.

1.4.5 Step 6 – Share the Checklist

In the last step, we share the checklist for the problem statement development. Table 1.2 presents the checklist for the problem statement development in this study, based on the guidelines proposed by Blum and Preiss (2005). The next section outlines the problem statement in this study.
<table>
<thead>
<tr>
<th>Task</th>
<th>Checklist</th>
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| Ensure a stranger could understand your problem in no more than 250 words. | Done:  
- University 1st assessment (2011, 2012)  
- Correspondence with industry stakeholders |
| What is wrong in the sector/industry? | No empirical research has been conducted to gather evidence on the use of KI mechanisms by organisational superiors in the ES post-implementation phase, although many researchers have emphasised the importance and benefits of KI in ES. |
| What program needs evaluation? | ES post-implementation phase. |
| What accepted practice needs to be revisited? | KI mechanisms |
| Determines where the problem exists or is under study (specific organisations or areas of the country). | Private and government sector organisations which have been implementing an ES for more than a year as the ES implementation more than a year can be consider that the organisation already in maturity phase of ES adoption. |
| Determines what group is impacted by the problem. | Superiors and workers who are directly involved with an ES |
| Describes what needs to be done (evaluate, explore, test, understand, describe). | Empirically explore the role of KI mechanisms and the adoption of KI practices by superiors in the ES post-implementation phase. |
| Describes the type of design and how data will be collected. | Quantitative study will be performed. Data will be collected by distributing survey questionnaires that consist of 42 questions. |
| Describe the geographical location of population. | The questionnaires will be distributed to private and government sector organisations which are in the adoption stage of an ES (i.e. using an ES for more than 1 year) and having more than 20 ES workers. |
| Determines how others can benefit from the findings. | The findings will promote successful leadership strategies and KI practice in the ES post-implementation phase; this will be beneficial to organisations that have made huge investments in the ES implementation phase. |
1.4.6 Research Problem Statement

The problem is that no empirical research has been conducted to gather evidence about KI mechanisms and the adoption of KI practices by superiors in the ES post-implementation phase. Yet the importance of KI has been postulated by many researchers as a useful tool for superiors in managing the ES post-implementation phase. Thus, we employ a quantitative study design to empirically explore the role of KI mechanisms and the adoption of KI practices by superiors in the ES post-implementation phase. This quantitative study analyses data gathered from private and government sector organisations which were in the adoption stage of an ES (i.e. using an ES for more than 1 year). It is expected that the findings will promote successful leadership strategies and KI practices in the ES post-implementation phase. This will be beneficial to organisations that have made huge investments in the ES implementation phase (Grant, 1996b, Grant, 1996a, Newell et al., 2004, Gable, 2008, Sedera and Gable, 2010). Consequently, our research questions are postulated in the next section.

1.5 Research Questions

Thus, derived from the identified problem, the main question (RQ) and the sub-questions (RQ1, RQ2 and RQ3) for this study are presented in Table 1.3. Each of the research objectives is unique and has its own significance. The significance of this research is highlighted in the next section.
Table 1.3: Research questions

<table>
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<th>Question</th>
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<tr>
<td>Main research question</td>
<td>RQ Do KI mechanisms mediate between ES success and leadership styles whilst managing ES-related knowledge in the post-implementation phase?</td>
</tr>
<tr>
<td>Sub-research questions</td>
<td>RQ1 Which leadership styles are positively related to KI mechanisms during the ES post-implementation phase?</td>
</tr>
<tr>
<td></td>
<td>RQ2 How do KI mechanisms enable superiors with different leadership styles to achieve the organisation’s goals in the ES post-implementation phase?</td>
</tr>
<tr>
<td></td>
<td>RQ3 What is the influence of leadership style on the use of KI as a tool towards ES success?</td>
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</table>

In order to answer these questions, the objectives of our research are achieved through the development of a theoretical framework of KI as a mediator between leadership styles. The framework enables us to empirically validate the study. Our research objectives are discussed in the following section.

1.6 Research Objectives

Motivated by the factors that contribute to ES failure as discussed above (Section 1.3), and aiming to answer our research questions, this study is intended to achieve the five objectives:

**Objective 1**: To investigate how KM processes, particularly KI, can contribute to ES success.

**Objective 2**: To develop an inferential theoretical model that empirically measures KI as a mediator between leadership styles and ES success.

**Objective 3**: To outline how KI mechanisms are used differently by different leadership style approaches.
Objective 4: To demonstrate to the organisation the importance of nurturing KI as a management practice.

Objective 5: To show how an organisation can forecast the kind of leadership that would efficiently manage ES-related knowledge using KI as a tool in the ES post-implementation phase.

1.7 Research Significance

Organisations spend a huge amount of money in order to utilise all the benefits offered by an ES. Yet organisations often fail to realise that implementing the ES is not the end of the story: as a consequence, inappropriate leadership behaviour and the use of improper tools while managing the ES post-implementation phase can have negative impacts on the organisation (e.g. workers not well equipped with sufficient knowledge to operate ES, lack of superior supports in ES maintenance activities, superior not conducted or less attention on ES group problem solving). The outcomes of the present study can help organisations to forecast the consequence of not implementing KI when managing ES post-implementation and to identify the most effective leadership style.

Many extant studies on the ES post-implementation phase have focused on cause-effect and ES best practice (Yu, 2005; Wagner and Newell, 2007; Häkkinen and Hilmola, 2008; Helo et al., 2008; Zhu et al., 2010); however, the present study focuses on how KI mechanisms can function as a mediator between different leadership behaviours and ES success in the post-implementation phase. The impact of leadership styles on IS success has already been explored by some researchers (Bryant, 2003; Ke and Wei, 2008; Ramirez, 2010; Cho et al., 2011; Shao et al., 2012a); however, the actual influence of transactional and transformational leadership styles, and the use of KI mechanisms as mediator between leadership styles and ES success, have not been empirically tested. Most of the studies in the
literature investigate only one of the leadership styles and none empirically test KI as a mediator. Hence, we develop a research model of leadership styles and KI as a mediator to be used:

1. As a lens to investigate how KI can be used as a tool in the ES post-implementation phase to ensure ES success.

2. As a way to identify which leadership styles are most appropriate in managing the ES post-implementation phase.

3. As a way to analyse whether KI mechanisms can be part of the workplace culture adopted in organisations to ensure the longevity of the ES.

This study represents a significant endeavour to promote the nurture of knowledge in organisations and to position superiors with the right leadership styles to manage the chaos of the ES post-implementation phase. An emphasis on the appropriate leadership styles will ensure the longevity of the ES especially in the vulnerable post-implementation stage. The next section describes the scope of the research.

1.8 Research Scope

The scope of this research is delimited by the following areas of focus:

1. The target organisations are the companies which are implementing and adopting an ES (i.e. implementing an ES for more than one year).

2. The target group consists of managers and workers who are directly involved in the ES post-implementation phase.
3. Only KI mechanisms which are used by superiors in the ES post-implementation phase are investigated.

4. The data is collected from private and government sectors.

5. Only organisations with more than 100 ES users will be considered for data collection.

6. All the data with straight line answers (i.e. all questions have same answer), incomplete (i.e. more 15% of the questions in the survey is not answered by respondent) are removed.

For the survey, the companies that have already implemented an ES in its daily operations for more than one year is choose. This duration is considered appropriate for an investigation of the ES post-implementation phase. For the target group, the questionnaire will be distributed to superiors who have had at least five workers under his/her supervision in order to gain more variation in the data and thus guarantee the accuracy of the results. During data collection, the KI mechanism is focusing on rather than the knowledge that is to be integrated (as long the knowledge is ES-related knowledge, see Chapter 2, Section 2.9). KI mechanisms will be captured based on Grant’s (1996b) knowledge-based theory (KBT) and the discussion by Huang and Newell (2003) which provide the study with an understanding of practical KI mechanisms in managing the ES post-implementation phase (Chapter 5). According to this scope of research, the data are gathered by disseminating questionnaires on the investigated areas.
1.9 The Thesis Outline

This section provides an overview of the chapters in this thesis. The remainder of this thesis is organised as follows:

Chapter 2 – Literature Review
A review of the related literature is presented in this chapter. Extant studies that are related to the research domain are analysed in order to show the motivation for the present research. For the topics which are particularly focused on, thorough discussions are presented in the relevant chapters. Chapter 2 also acts as the knowledge base for this research.

Chapter 3 – Research Methodology
This chapter discusses the methodology that is used to conduct the study, including the research approach to be used and a step by step explanation of the research design.

Chapter 4 – Research Model Development
The development of the theoretical model of leadership styles and ES success without and with involvement from KI mechanism are discussed in this chapter. The research model diagram is introduced in this chapter in order to promote KI mechanisms as a mediator between two leadership styles and ES success and to demonstrate the importance of KI to the survival and success of ES implementation in the organisation.

Chapter 5 – Analysis, Results and Discussion
In this chapter, the analysis of the data after the data are collected are discusses in details. This chapter also discusses whether or not the hypotheses of the study are supported and either KI mechanism mediates the leadership styles and ES success.

Chapter 6 – Contributions and Conclusion
The final chapter of this thesis discusses the contributions of the study. This chapter also presents the conclusions from the findings in order to demonstrate the importance of the
findings to the survival of an ES in an organisation. This chapter also offer suggestions for further extensions of the research.
REFERENCES


