



A Mediating Effect on ERP KM Model for the Performance of Oil and Gas Sector in Klang Valley: A Preliminary Study

Muhamad Yusnorizam Ma'arif¹, Nurhizam Safie Mohd Satar¹, Dalbir Singh Valbir Singh¹ Seyed Mohammad Motahar²

¹Research Center for Software Technology and Management, Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor Malaysia, p89058@siswa.ukm.edu.my, nurhizam@ukm.edu.my, dalbir@ukm.edu.my

²School of Science, Engineering and Information Technology, Federation University Australia, University Drive, Mt Helen VIC 3350, Australia, s.motahar@federation.edu.au

ABSTRACT

The development of information technology and the internet has created a borderless business environment and increased market competition. Driving globalization trends, information technology facilitates the organization in the aspect of the decision-making process, increasing productivity with cost-effective and fast delivery to meet customer needs. This article presents a conceptual study of ERP KM model and proposes a direction for further investigation. In this study, a literature review on Incentive as mediating effects in ERP KM model against operational and financial performance was analyzed. In order to achieve this target, to maintain the competitive advantage, oil and gas industry players implement Knowledge Management (KM) on Enterprise Resource Planning (ERP) systems. However, most studies focus only on the implementation and improvement of the ERP process flows as compared to KM concepts. This paper covers literary studies related to KM and ERP as well as merging these two concepts to form the appropriate ERP KM model for the oil and gas sector in Klang Valley, Malaysia. The new model of ERP KM Rizam 2019 introduced in this study will be tested for its effectiveness in the oil and gas sector especially in the Klang Valley. It was found that the mediating effect 'Incentives' in addition to KM is expected to have a positive relationship on operational and financial performance compared to the direct influences of ERP usage on performance.

Key words: ERP, Incentives, KM, Mediating Effect

1. INTRODUCTION

KM is the practice of generating, sharing, consuming and handling information about knowledge in an organization [1]. Reference [2] explains that KM is the practice applied to construct, capture, integrate, and share knowledge among workers within a unit, department or an organization. It refers to a multi-disciplinary method to accomplishing an organization objective by using the greatest knowledge. This

discipline has been discovered since 1991. KM embraces courses trained in information systems, management, business administration, libraries, and information sciences [3]. Huge corporations, including public organizations and non-profit organizations, have resources committed to KM's exertion, as a business strategy [4]. In the context of this study, the ERP system is a source. KM's initiative focuses on organizational intentions such as performance development, modest benefit, innovation, lessons learned, assimilation and unceasing improvement of the organization [5].

ERP is a software system developed to support the organization's operations in managing their work processes or business modules [6]. ERP is a need in managing the business in this century [7], [8], [9], [10]. The merger of two different sources, KM and ERP, had a greater impact on business performance than just a direct impact on each individual resource [11] because there was a positive synergy between KM and ERP sources where both sources were complementary to each other if merged.

2. PROBLEM STATEMENT

Knowledge is needed to solve any problems in managing work operations. Therefore, knowledge in ERP is important for business decisions where transactions will only be recorded and audited using data stored in an integrated ERP system. This statement is consistent as in [12] that the use of knowledge can be explained by the use of knowledge to solve problems and decide on a matter. Reference [11] clarify that if the firm only uses ERP, there is no KM element in it, the management team may not be able to identify issues that occur within their organization. ERP cannot bring a competitive advantage to the organization when implementing ERP in a simple and concise way. Communication shortage is one of the most important issues in the business world because of an inefficient point in managing supply chains within the organization. The effect of these problems led to increased organizational costs, reduced profits and lack of operational efficiency, as there was no generation of knowledge such as discussions, meetings,

and brainstorming. Inefficiency or problem cannot be eliminated during and post ERP implementation. Any issues and problems within the organization need to be identified and resolved as soon as possible, through the implementation of the KM approach.

Many organizations acquire and implement ERPs to improve their performance of operations and construct intentional value. Nevertheless, they miscarry to realize this goal because of the shortage of information and well thought of ERP usage and its life cycle [13]. Concerning the noteworthy impact of ERP systems in an organization, as in [13] quote that “the success of a company increasingly depends on timely information (internal and external) being available to the right person at the right time for crucial managerial decision-making.” The daily task of managers includes processing information about internal operations and external changes. Manager discretion may result in variations in operations and process performance, which ultimately affects firm-level output [14]. Reference [15] explained that “overall performance is typically composed of two performance dimensions: operational performance and strategic performance”.

The performance of organizations could be reduced in a while after the ERP implementation is completed [16]. Previous research shows that there is a progressive correlation between output and operational and financial presentation. In nowadays overall and economical business surroundings, administrators are gradually under stress to develop the financial performance, productivity, and cost-effectiveness of their businesses. That is the reason why many organizations adopt new technology in order to achieve the objective [17]. In addition, if there is no incentive in KM practice itself will reduce the employee's tendency towards the learning process and skill upgrades in handling the ERP system. Based on the above problem statement, the study aims to introduce a new KM initiative to solve operational and financial performance issues in the oil and gas sector. The acquisition and empowerment of ERP knowledge have a positive impact on operational and financial performance, especially in the oil and gas sector.

3. LITERATURE REVIEW

Researchers have studied the effect of having knowledge management to improve the performance of an organization. The incentive is one of the investments that employers should make to achieve this goal. Reference [18] found that ERP is a strategic investment that could affect operational and financial performance. This study also provides empirical evidence that could justify the use of ERP. It demonstrates the causal chain between ERP and organizational performance while the research framework is very much in line with the

conventional role played by ERP in an organization. Previous studies have primarily concentrated on knowledge management. Reference [19] proposed that KM has a positive effect on the successful execution of an ERP system implementation in an organization. Greater knowledge flows can provide significant benefits to the refinement of organizations' inventions early in development. For example, managers responsible for development activities are more able to solve technical problems through accessing organizations' broader capabilities as well as develop more creative solutions to problems [20].

There have been several studies in the literature reporting about the mediating effect on ERP KM model on the organizational performance [11], [21], [22], [23], [24], [25], [26]. A large and growing body of literature has investigated the mediating effect element in the ERP KM Model as a determinant of operational performance by using an ERP system [11]. Authors have suggested the effect of adding the new mediating element in the existing ERP KM model to demonstrate whether it has a positive relationship to operational performance in the oil and gas sector. The Incentives as a new mediating effect is illustrated in the next paragraph of the proposed ERP KM Model.

Previous research has shown that ERP handlers increase 25% of their familiarity from training or exercise, 75% of the knowledge distribution practice. While common dogmas are like incentives (i.e. appreciation and prizes) contribute to the success of knowledge sharing that can underwrite to the operational performance. These incentive components have their basis for performance [27]. Previous research findings into mediating effect elements like incentives have been inconsistent and contradictory with some of the studies. A study has originated that self-structured environment helps the accumulation of knowledge, expertise progress, and business development without the need to resort to powerful incentive mechanisms, but, Instead, it makes any external mediation awkward [28]. Not all organizations carry out the pay-for-performance policy through incentives. To optimize pay base for performance, organizations need to comprehend the meaning of incentives that are vital factors for constructing decisions. The initial step towards achieving this objective is to make the management of the operations that can support and fairly take into account the views of subordinates in the whole organization so that knowledgeable employees are aware that the organization is supporting their daily work activities adequately and recompense their hard work legitimately [29].

Recent studies have confirmed that an important determinant of the success of any organization in the transferal of knowledge is the means of treatment its incentives, which forms on employee motivation to continue to participate in the

process of gathering the knowledge. Present studies have scrutinized the influence of affirmative incentives on employee knowledge management through partaking habits. In 2016, as in [30] published a paper in which they investigate the influence of incentives on the process of transferal of knowledge. The level of communication among employees, respect for each other, safety and comfortable environment, harmonious relationship and free working hours are the proven ways of established incentives that have been used in China. This incentive has been identified as an important measure of general behavior. The worth of incentives is an important motivation that has been denied as having the ability to give positive results in relation to the tendency to approach something, or a bad impression related to the tendency to evade it. Good incentive results are the benefits/losses within the organization. Positive incentives are a way to implement and motivate workers. Whereas economic incentives related to better remuneration package, promotion or other bonuses and other non-financial incentives, such as honor and friendship, may also be given to inspiring employees[30].

The author has proposed incentives to be an additional mediating effect on the existing mediation effect of KM, into the ERP KM Rizam 2019 (Figure 2), the new proposed model. Their impacts and relationships will be identified in the next research phase whether they can affect the operational performance and financial performance of the oil and gas sector in the Klang Valley.

4. METHODOLOGY

The ERP KM model proposed as in [11] adopted to build the ERP KM model that is suitable for the oil and gas sector in the Klang Valley. The Acar Model has been used in previous studies by collecting data from industrial areas in some of the modern cities found in Turkey and then analyzed to assess the importance of resources to the organization's performance. Acar's Model has been applied to manufacturing companies. Therefore, the application of this model in other sectors such as services as well as oil and gas can be further studied.

4.1 ERP KM Model

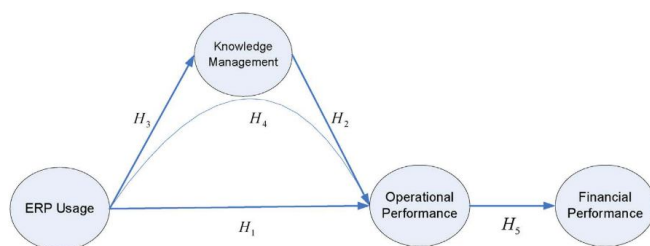


Figure 1: ERP KM Model (Source: [11])

ERP meets the competitive advantage through important information that was generated, shared, and managed. However, as in [11] shows that KM has a tremendous effect and gives a good indicator to work performance within the organization, compared to the impact of ERP use (Figure 1). References [31] shows a good and positive relationship between KM's effectiveness and ERP success. This relationship is significant to the operational performance within the organization. A study by [11] found that the direct relationship between ERP, KM, operational excellence, the financial status of the organizational and KM effect on the relationship between ERP and operational performance in the context of its study was investigated using the SEM modeling. The context of his study was the manufacturing sector and only concentrated in a country.

The survey was developed to measure the baseline determinants of KM implementation and the use of ERP depending on the five-point scale (1: very disagreeable and 5: strongly agreed). As a result, the author as in [11] found below relationship from H1 to H5 to explain about the impact; H1: The use of ERP is considerably related to the performance of operations.

H2: KM is absolutely related to operational performance.

H3: The use of ERP is positively related to Knowledge Management (KM).

H4: The effect of ERP use on KM-mediated operational performance is stronger than its direct impact.

H5: Performance of operations positively related to financial performance.

4.2 Proposed ERP KM Model

The new proposed ERP KM model introduces a new element that is a mediating effect on organizational performance, an "Incentive" that is a KM practice. It has been practiced in other sectors such as banking and finance [32]. An illustrative picture of the proposed model of ERP KM Rizam 2019 is presented as follows:

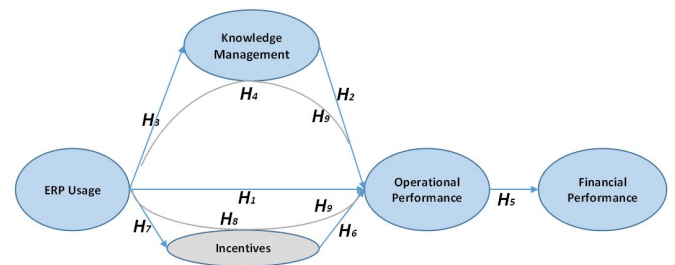


Figure 2: Proposed Model: ERP KM Rizam 2019

The justification for adding the 'Incentives' elements in the proposed model is to refer to the organization's readiness since the establishment of the ERP execution to nurture, locate and preserve key personnel for ERP's longstanding attainment. The effort may entail supplementary expenditures

such as rewards or elevations, as the losses may arise from the ERP performance impaired by the inefficiency of the organization in handling ERP [33]. Incentives are not necessarily in the form of money, they can be provided in other forms such as non-financial performance incentives. This is evidenced as in [34], in the previous study on the inclusion of non-financial performance incentives in proven executive compensation contracts that can improve performance. In the context of this research paper, incentives are given to employees who achieve an ERP training benchmark conducted in the organization. The new element of mediating effects in the proposed ERP KM model in Figure 2 can be described as below:

Mediating Effect 1:

Knowledge Management (KM) - Controlling information and resources efficiently in commercial organizations.

Mediating Effect 2:

Incentives - Something that encourages or encourages someone to do something.

5. FINDING AND DISCUSSIONS

The discussion of the results begins with the proposed model of ERP KM Rizam 2019 as shown in Figure 2. To define the different characteristics of existing KM practice, the verdicts of this study are conversed and adapted with preceding discoveries [1], [32], [35]. Reference [1] emphasizing the definition of knowledge management solely, not explaining the relationship between KM against any dependent variables like organizational performance and financial performance. The research study as in [1] found that KM is the process of generating, allotment, applying and managing organizational info and data. KM is also an administration manner for making, sharing and expanding organizational information and knowledge. The findings by [32] contradict the conceptualize study by Author and finding by Girard as in [1]. The author examined the important variances in practicing KM in the aspect of knowledge obtaining and enablement; training and mentorship; communication; and incentive but not discussed the impact to the organizational performance. In another study, [35] defines an ERP knowledge transfer framework for ERP implementations based on empirical findings which also considers strategic decisions to be made during implementation for effective KM. The study also not emphasize the relationship between ERP, KM and performance measurement. In this research paper, the hypothesis is formulated (As illustrated in Figure 2) and the survey will be conducted in the next research phase, as a result, the data will be analyzed based on formulated hypotheses as below;

H1: Demonstrate whether the use of ERP is considerably related to the performance of operations in the oil and gas sector.

H2: Demonstrate whether KM is absolutely associated with the performance of operations in the oil and gas sector.

H3: Demonstrate whether the use of ERP is positively associated with KM.

H4: Indicates whether the effect of the use of ERP on the KM-mediated operational performance is stouter than the direct impact.

H5: Demonstrate whether the performance of the operations is absolutely concomitant with the performance of finance in the oil and gas sector.

H6: Demonstrate whether incentives are positively related to operating performance in the oil and gas sector.

H7: Demonstrate whether the use of ERP is certainly related to 'incentives'.

H8: Indicates whether the influence of the use of ERP on the performance of operations interceded by incentives is stronger than the direct influence.

H9: Indicates whether the result of the use of ERP on the KM-mediated operational performance by KM and 'Incentives' is more solid than the direct result.

Among the plausible explanations for these findings is that the more hypothesis testing is carried out on the ERP KM model using diverse mediating effects, the more impressions of operational performance and financial performance can be translated. Nevertheless, this paper is just a concept paper on how hypothesis formulation is developed. Subsequent research must be conducted by collecting relevant data to analyze and interpret the results in order to test the proposed model.

6. CONCLUSION

This conceptualize study was conducted to examine the uninterrupted and ancillary effects of the use of ERP System with the mediating effect 1 and 2 on the operational and financial performance of the oil and gas sector in the Klang Valley. Mediating effect 1 refers to 'Knowledge Management' while mediating effect 2 refers to 'Incentives' in the proposed Model ERP KM Rizam 2019. Important conclusions drawn from this work include: 1) The new model of ERP KM Rizam 2019 will be the further experiment and tested in the future study using primary data from ERP users in the oil and gas sector in Klang Valley. 2) The hypothesis testing will be conducted based on the finding highlighted in this study. These findings provide the benefit for future research such as the introduction of basic ERP KM models with mediating effects, recent reference of literature reviews and the importance of KM in the implementation of ERP systems, especially in the oil and gas sector. The author hopes that researchers will continue to study in depth to prove the effectiveness of the proposed model.

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