

Information Systems Integration and its Impact on Knowledge Management Processes

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ABSTRACT

The aim of this research paper is to identify the impact of information systems integration on knowledge management processes (discovery, capturing, sharing and application). Due to information systems integration is becoming more important for knowledge management initiatives. Data were collected via questionnaires from 113 employees working in the Arab Bank-Jordan. The study hypotheses were analyzed using SPSS (20) statistics. The results of this study Revealed that there is a significant impact of information systems integration on knowledge management processes (discovery, capturing, sharing and application). Therefore, the empirical findings will certainly help both researchers and practitioners in future Knowledge Management process.

Keywords: Information Systems Integration, ERP Systems, Knowledge Management Processes.

1.0 Introduction

Organizations around the world have various information systems need to be integrated, these systems store valuable data to the organizations, and they are often unable to communicate with each other. Moreover, replacing these systems with new systems is also very expensive and add additional costs to organizations. When the information systems are integrated with new technologies they bring about several benefits to business processes (Ramanika. Abeysekera, 2005), therefore, organizations need to integrate the dispirited information systems throughout the organization. Information systems integration enable organizations to combine and store the dispirited data sources into a single data base in order to increase the ability to take timely accurate decisions that support the all business processes within an organization including knowledge management processes: Discovery, capturing, sharing and application (Becerra-Fernandez et al., 2004). Knowledge management initiatives include all the processes concerned with the creation, acquisition, capture, sharing and applying of knowledge in a ways that directly effect on the overall performance. Knowledge management is gaining the right information within the right context, person, and time for the right business purposes and distributing individual and group's knowledge are basically the KM activities that involve generation, codifications and transfer (Davenport, 1997). However, the mission of the information systems integration within organizations has important role to enhance the overall business processes including knowledge management processes (discovery, capturing, sharing and application).

There are several inhibitors facing the application of knowledge management initiatives within an organization or among organizations around the world. Based on this context, this study present information systems integration as an opportunity for organizations to resolve some of the important problems associated with implementation knowledge management processes specifically in Jordanian Organizations and generally in developing countries who are experiencing similar context and situations.

In particular, this study seeks to collect statistical information about the systems integration and the relationship between information systems integration and knowledge management processes.

2.0 Information systems integration and ERP Systems

The importance of Internal integration within the firm's boundaries in order to eliminate the traditional functional "silo approaches" and focus on the process rather than function. The level of internal integration as the extent to which logistics activities interact with other functional areas. External integration, on the other side, has to be found along the supply chain: It is the integration of the logistics activities across firm boundaries (Stock, Greis & Kasarda, 1998). The interdependence theory illustrates that relationships among the organization units may be described as a collective activities, individuals and behaviors of groups (Brown, 1983). Internal integration should be present when the organizational functions are separated and independent on each other and when procedures, and business operations require cooperation (Brown, 1983: Darja. T and Sara. O, 2011). External integration is very important process after the internal integration has been successfully implemented. According to Lee (2000), identified three dimensions of external integration: the integration of information that means sharing of information and knowledge among supply chain parts, the co-ordination and co-use of resources refer to balancing decision making and responsibilities in supply chain parts. Organizations consist of

several departments which integrate with each other and enabled by technologies in order to produce and to meet customers' needs. (Kosanke et al., 2002). As we mentioned before in the literature there are several definitions of ERP systems, enterprise resource planning system is a packaged business software system that enables a company to linkage and integrate the majority of business units processes, and share or transfer common data and practices across the entire organization (Seddon, Shanks & Willcocks, 2003). Jakovljevic, P.J. (2005) described ERP software is a suite of application program modules designed to set up an interactive environment for enterprise users to analyze and manage business processes associated with the production and distribution of goods and services. Watson & Schneider (1999) described that ERP system is integrated and customized computing software-that meets the majority of the information systems requirements of an organization.

There are several advantages of implementing integration alternatives and packages in order to increase efficiency, profitability, decrease in costs, and real-time view of all their data and operations, which can lead to better choices and decision making. Integration processes assist the use of data resources and functionality embedded in the existing legacy systems and applications instead of replacing them with new systems. (Johnson, 2002). In order to capture the business benefits of the enterprise resource planning system. Dezdar & Sulaiman (2009) describes that organizational impact and user satisfaction were the most important measures for Enterprise Resource Planning application ERP organizational impacts refer to the impact of ERP system application on the organizational performance and its impact on the satisfaction of the users. During the past years, organizations around the world have implemented enterprise resource planning Systems. ERP systems are software packages that enable organizations to integrate their business processes and all the data relevant to their work. With enterprise resource planning systems, firms are able to govern all their tangible or intangible resources more effectively. The enterprise resource planning system does not only assist in integrating business processes across an organization but also helps all management levels to increase the visibility of the business through the real-time financial and production information. (Ander egg, 2006).

The adoptions of enterprise resource planning systems area complex technological, organizational, and business issues. It requires enough knowledge of a process approach, internal and external environment, industry competition, and information technology. Business organizations already have significant experience in application of ERP systems (Sammon and Adam, 2010).

3.0 Knowledge management processes

Knowledge management in organizations is an integrated process that can help to improve and leverage innovation process, Successful knowledge management refer to the creation of management processes and infrastructure to bring together both knowledge and communities that will sustain the creation, utilization and retention of knowledge (H. Alryalat and S. Alhawari, 2008; Z. Sun and G. Gang, 2006)

Knowledge Management (KM) is an approach to reaching organizational goals by the best using of knowledge, or "doing what is needed to get the most out of knowledge resources" (Becerra-Fernandez et al., 2004). Knowledge management can also enable a good relationship with partners such as customers by increasing customer knowledge, response to customer queries, suggestions, and complaints. In addition to ensures improved consistency and quality when serving customers. (Z. Sun and G. Gang, 2006).

The purpose of knowledge management is the developing or maximizing of the knowledge resources in an organization to provide better knowledge practices, improved organizational behaviors, better decisions and alternatives in order to improve the overall performance (William R. King, 2009).

Knowledge may be classified in a number of ways. Firstly, it can be described as either tacit or explicit knowledge. Tacit knowledge is the expertise and experience that resides in the minds of individuals and has not been formally documented, whereas explicit knowledge is that which has been documented and can be shared with others (Polanyi 1966). Explicit knowledge can be readily captured, codified and communicated to others in forms such as specifications or procedure manuals, thus becoming universal knowledge. Tacit knowledge is influenced by personal commitment, ideals, values and emotions, is hard to formalize and includes subjective insight, intuition and hunches (Debowski 2006; Nonaka 1991). Becerra-Fernandez et al. (2004) identified four KM processes: Knowledge discovery, knowledge capturing, knowledge sharing, knowledge application.

Knowledge discovery is a process lead to extraction of interesting information from data in large databases. (Fayad et al., 1996) Knowledge discovery could be defined as the development of new tacit knowledge includes hunches, insights, and intuitions, or explicit knowledge refers to knowledge that has been expressed into words and numbers from data and information or from the synthesis of prior knowledge (Fernandez et al., 2004). The discovery of new explicit knowledge depend on combination mechanism, whereas the new tacit knowledge discovery depend on socialization mechanism. Knowledge discovery is very important mechanism to build of organizational memory (Becerra-Fernandez et al., 2004; Davenport & Pursak, 1998, Guruge, 2002; Turban et al., 2009). Malhotra (2000) and Marko Grobelnik, Dunja Mladenic (2005) mentioned that Knowledge Discovery may be defined as "a set of techniques coming mainly from the area of Artificial Intelligence but also borrowing

important building blocks from other fields such as Statistics and Databases".

Knowledge capturing process support the process of retrieving either explicit or tacit knowledge that embedded within people mind, artifacts, or organizational entities. Knowledge capture includes two main activities: (1) the identification of knowledge that is essential to the organizations' business processes, and (2) the evaluation of the critical knowledge in order to decide whether to actually retain it for packaging and dissemination or not (Lena Aggestam, et al., 2014).

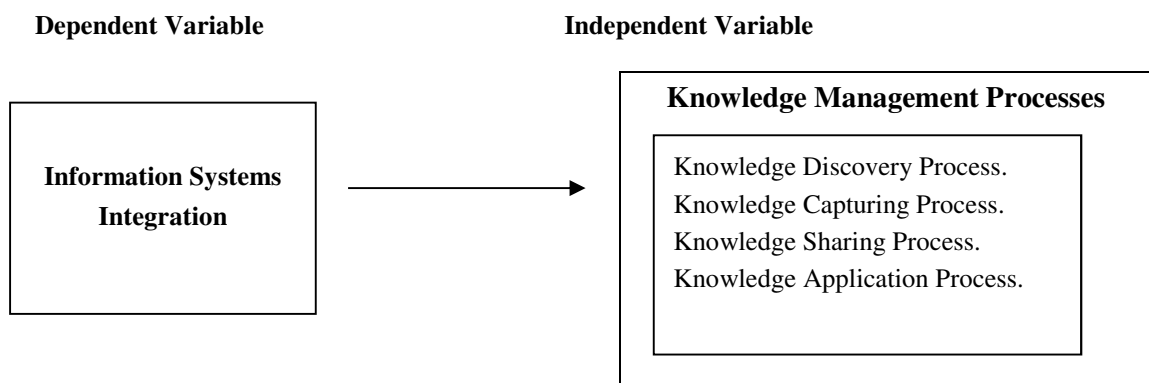
Knowledge capturing process can help capture knowledge that resides within or outside organizational boundaries including the competitors, customers and suppliers.. Knowledge capture processes depend on mechanisms of externalization and internalization. The creation new models or story writing refer to externalization mechanism. But Learning by observation and face-to-face meetings are mechanisms that facilitate internalization (Becerra-Fernandez et al., 2004).

Knowledge sharing is the process through which knowledge whether explicit or tacit is communicated or transferred to other people. According to Jensen and Meckling (1996), knowledge sharing is effective transfer, so that the knowledge recipient can understand it well enough. (Becerra-Fernandez et al., 2004). Knowledge sharing may take place among people as well as across groups, departments, or organizations (Alavi and Leidner, 2001, Stewart, 2000).

Knowledge application refer to using knowledge in order to solve problems and make business decisions. Therefore, knowledge application benefits from two processes: Routines and direction.(Grant, 1996).

4.0 Research Model and hypotheses

Based on the findings in the literature review, the following conceptual model can be drawn (figure 1). To examine the impact of information systems integration on knowledge management processes within the Arab bank- Jordan. Several hypotheses are conducted. There is one main hypothesis and four sub hypotheses which are to be tested. The hypotheses are expressed in terms of two variables.



Based on the findings in the literature review, the following conceptual model can be drawn (figure 1). To examine the impact of information systems integration on knowledge management processes within the Arab bank- Jordan including the information systems integration (independent variable). In addition, the figure shows the knowledge management processes as the study's (dependent variable).

Several hypotheses are conducted. There is one main hypothesis and four sub hypotheses which are to be tested. The following hypotheses of research were formulated:

H1: There is no statistically significant impact of information systems integration on knowledge management processes in Arab bank- Jordan.

H1A: There is no statistically significant impact of information systems integration on knowledge discovery process in Arab bank- Jordan.

H1B: There is no statistically significant impact of information systems integration on knowledge capturing process in Arab bank- Jordan.

H1C: There is no statistically significant impact of information systems integration on knowledge sharing process in Arab bank- Jordan.

H1D: There is no statistically significant impact of information systems integration on knowledge application

process in Arab bank- Jordan.

5.0 Research Methodology

To achieve the research objective, a questionnaire survey approach which developed utilizing theoretical and experimental literature to collect data and test the research study hypotheses empirically. The independent variable in the questionnaire is information systems integration whereas knowledge management processes is the dependent variable. In this study, knowledge management processes is measured as four constructs including: knowledge discovery, capturing, sharing and application and information systems integration measured as two constructs including internal integration and external integration. The dimensions of information systems integration are measured with twelve items and are adapted from: Germain et al, (2006) and Closs. D, Savistskie. K, (2003). Furthermore, knowledge management process is assessed with sixteen items adapted: Becerra-Fernandez, I., Gonzalez, A. & R. Sabherwal, (2004).

The study population consisted of all the employees who work at different managerial levels (senior management, middle management, and operational management) Arab bank- Jordan. Purposive sampling technique was used to select respondents from the population of the study. A total of 150 questionnaires were distributed to the participants who comprised the purposive sample of the study. Of the total 113 questionnaires valid for analysis were retrieved. That means the usable response rate was 75 %. In this study, 5-point Likert scale was used for scoring responses as a follow: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree. The collected data was statistically analyzed in order to describe the study sample characteristics, and testing the study hypotheses. The characteristics of the sample are presented in Table (1).

Table (1)
Characteristics of the sample

	Category	Frequency	Percentage
Gender	Male	76	0.67
	Female	37	0.33
Education	Master's degree or more.	18	0.16
	Bachelor degree.	71	0.63
	Diploma or less.	24	0.21
Experience	Less than 2 years.	23	0.20
	2 to 4 years.	44	0.39
	5 to 7 years.	30	0.27
	8 years or more.	16	0.14
Managerial Level	Senior	8	0.07
	Middle	23	0.20
	Operational	82	0.73

6.0 Reliability and Validity:

In order to ensure that the study instrument was valid, the questionnaire was distributed to Seven specialists in the field of the study. Some adjustments were applied accordingly.

The Cronbach alpha reliability of the questionnaire was measured which shows its high reliability. Table 1 shows the reliability of information systems integration (independent variable) and Knowledge management processes (dependent variable). Table(2) shows Cronbach's Alpha values as a bellow:

Table (2)
Reliability Statistics

Variable	Number of items	Cronbach's Alpha
Information systems integration (Independent)	12	0.81
Knowledge management processes (Dependent)	16	0.93

7.0 Data Analysis and Results

7.1 H1: There is no statistically significant impact of information systems integration on knowledge management processes in Arab bank- Jordan.

As shown in table (3), there was a significant impact of information systems integration on Knowledge management Processes in Arab bank- Jordan, This means the (0.613) of knowledge management Processes changeability resulting from the Changeability of information systems integration. AS F value was (64.771) and it's significant at level ($\alpha \leq 0.05$), that means refusing the null hypothesis and accepting the alternative hypothesis: There is statistically significant impact of information systems integration on knowledge management processes in Arab bank- Jordan

Table (3)
Regression analysis test results

Information systems integration (Independent Variable)	Knowledge management processes (Dependent Variable)				
	(R)	(R) Square	F	β	Sig
	0.822	0.613	64.771	0.799	0.000

7.2 H1A: There is no statistically significant impact of information systems integration on knowledge discovery process in Arab bank- Jordan.

Table (4)
Regression analysis test results

Information systems integration (Independent Variable)	knowledge Discovery Process				
	(R)	(R) Square	F	β	Sig
	0.669	0.441	71.341	0.878	0.000

Based on table (4) we observed that there is significant impact of information systems integration on Knowledge discovery Process in Arab bank- Jordan. The R was (0.669) at level ($\alpha \leq 0.05$). Whereas, the R2 was (0.441). This means the (0.441) of knowledge discovery process changes abilities resulting from the Changeability of information systems integration. AS F value was (71.341) and it's significant at level ($\alpha \leq 0.05$), that means refusing the null hypothesis and accepting the alternative hypothesis: There is a significant impact of information systems integration on Knowledge discovery Process in Arab bank- Jordan.

7.3 H1B: There is no statistically significant impact of information systems integration on knowledge capturing process in Arab bank- Jordan.

Table (5)
Regression analysis test results

Information systems integration (Independent Variable)	knowledge Capturing Process				
	(R)	(R) Square	F	β	Sig
	0.713	0.491	73.221	0.985	0.000

From Table (5) we noted that there is significant impact of information systems integration on knowledge capturing process in Arab bank- Jordan. The R was (0.713) at level ($\alpha \leq 0.05$). Whereas the R2 was (0.491), this means the (0.491) of knowledge capturing process changeability resulting from the changeability in information systems integration. As F value was (73.221) and it's significant at level ($\alpha \leq 0.05$). That means refusing the null hypothesis and accepting the alternative hypothesis: There is a significant impact of information systems integration on of knowledge capturing process in Arab bank- Jordan.

7.4 H1C: There is no statistically significant impact of information systems integration on knowledge sharing process in Arab bank- Jordan.

Table (6)
Regression analysis test results

Information systems integration (Independent Variable)	Knowledge Sharing Process				
	(R)	(R) Square	F	β	Sig
	0.633	0.406	61.544	1.356	0.000

Table (6) illustrates that there is significant impact of information systems integration on Knowledge sharing Process in Arab bank- Jordan. The R was (0.633) at level ($\alpha \leq 0.05$). Whereas, the R2 was (0.406). This means the (0.406) of Knowledge sharing Process changeability resulting from the Changeability of information systems integration. As F value was (61.544) and it's significant at level ($\alpha \leq 0.05$). That means refusing the null hypothesis and accepting the alternative hypothesis: There is a significant impact of information systems integration on Knowledge sharing Process in Arab bank- Jordan.

7.5 H1D: There is no statistically significant impact of information systems integration on knowledge application process in Arab bank- Jordan.

Table (7)
Regression analysis test results

Information systems integration (Independent Variable)	Knowledge Application Process				
	(R)	(R) Square	F	β	Sig
	0.588	0.379	63.613	1.356	0.000

Table (7) illustrate that there is a significant impact of information systems integration on Knowledge application process in Arab bank- Jordan the R was (0.588) at level ($\alpha \leq 0.05$). Whereas, the R2 was (0.379). This means the (0.379) of Knowledge application process changeability resulting from the Changeability of information systems integration. AS F value was (60.613) and it's significant at level ($\alpha \leq 0.05$), that means refusing the null hypothesis and accepting the alternative hypothesis: There is a significant impact of information systems integration on Knowledge application process in Arab bank- Jordan.

8.0 Finding and Implications

The most important findings of this research is that information systems integration positively effect on knowledge management processes (knowledge discovery, capturing, sharing and application), the four knowledge management processes need to be developed, supported by using both internal level and external level integrated information systems. In practice it means that applying information systems integration is essential and has a positive impact on knowledge management that means this empirical research proved that knowledge management processes heavily related and rely on information systems integration. The empirical results provide support for the all hypotheses and reveal that information systems integration is critical for knowledge management processes. This finding is in line with previous empirical studies that show positive relationship between information systems integration and knowledge management processes. This finding is consistent with previous studies. (Ramanika. Abeyssekera, 2005; Anderegg, 2006; Lee, 2000 Seddon, Shanks and Willcocks, 2003).

These results may be useful in helping firms to understand the crucial link between information systems integration and knowledge management processes. Since, systems integration is a central concern to all firms, understanding the relationship information systems integration and knowledge management processes may help firms develop better and sustainable competitive advantages.

9.0 Conclusions, Recommendations

After carrying out the analysis, the research study concludes that the four main constructs of knowledge management processes are heavily affected by information systems integration. Empirical data show knowledge management processes such as (knowledge discovery, capturing, sharing and application) have been affected by information systems integration and consequently improve the practices of knowledge management. These findings can be used to improve the knowledge management practice of each organization and each knowledge entity. Finally, we argue that the conceptual model presented in this paper is a useful starting point to gain a deeper insight into information systems integration and KM processes constructs and their influence to the overall organizational performance. This conclusion can be adopted as a starting point for managers who are responsible to implement KM initiatives through their organization. Finally, there are many other dimensions and factors can also be incorporated for future studies.

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