

Linking organizational structure and organizational effectiveness: mediating role of knowledge management (case: mashhad's science and technology park)

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ABSTRACT

Practices of knowledge management are context-specific and they can influence organizational effectiveness. This study examines the possible mediating role of knowledge management in the relationship between organizational Structure and organizational effectiveness. A survey was conducted of 131 organizations. The results suggest that knowledge management fully mediates the impact of organizational Structure on organizational effectiveness. The findings carry theoretical implications for knowledge management literature as they extend the scope of research on knowledge management from examining a set of independent management practices to examining a system-wide mechanism that connects internal resources and competitive advantage..

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Introduction

The internal characteristics of the organization make up critical sources for success (Barney, 1991). Increasing attention has been paid to identifying what characteristics are vital to organizational success and how they exert their influence on organizational outcomes. Internal organizational context focuses on organizational structure (Pettigrew, 1979). What is lacking in existing literature, though, is an understanding of the intervening mechanism that explains the paths of the influence organizational structure on organizational effectiveness.

Traditionally, organizational effectiveness has been discussed as a major issue in the organizational studies and theories and has been considered major in organizational analysis (Goodman and Pennings, 1999).

In this respect, this study focuses on identifying the underlying sources or factors leading to business competitive advantage. Mostly identified variables including leadership style, organizational structure, strategy and culture, known as contextual variables, are studied directly or indirectly. On the other hand, due to knowledge driven organizations, the importance of effective knowledge management in organizational effectiveness cannot be ignored. Strong social revolution of the late twentieth century has had grounded on information and knowledge (Serna, 2012).

Literature Review

Knowledge management: Knowledge management is “a systematic and integrative process of coordinating organization-wide in pursuit of major organizational goals” (Rastogi, 2000, p. 40). Scholars generally agree that knowledge management practices need to fit with organizational context in order to create a competitive edge (Davenport and Prusak, 1998).

Existing studies cover some ground of the contextual antecedents of knowledge management (Gold et al., 2001; Lee and Choi, 2003). However, these studies usually start from a micro perspective and investigate the immediate knowledge-related environment rather than the general contextual

environment of the whole organization. They focus on exploring the antecedents of knowledge management rather than examining knowledge management as a mediating mechanism between organizational Structure and organizational effectiveness. Specifically both Gold et al. (2001) and Lee and Choi (2003) examine the aspects of organizational culture, structure, and technology that are directly related to knowledge management. They did not investigate the general cultural, structural, and technological characteristics of the whole organization.

Gao et al. (2008) argues that the concept of knowledge management is much more profound than a simple amalgamation of two words “knowledge” and “management”. Most definitions of knowledge management include actions such as identification, acquisition, creation, storage, sharing and use of knowledge by individuals and groups in organizations (Sun 2010; Alavi and Leidner, 2001).

According to Gao et al (2008), knowledge management can be scrutinized from both hardware and software point of view. In the latter, methodologies, approaches and tools of knowledge management are under centralization; however, in the former the focus is on the software being used, databases and information. Knowledge is one of the most important resources of enterprises and has been proved effective on moving toward success (Nevo & Chan, 2007). Knowledge is the only known asset that gets expanded when sheared (Vandaie, 2008). Despite extensive use of knowledge management in various organizations, yet no common definition has been provided. A usual problem in defining knowledge management is that it is in approximation almost anything that lets individuals to comprehend concepts essential in effective functioning can be referred to as knowledge management. This issue has caused pundits to present various definitions based on their different perspectives and experiences. Scanning through these various definitions, it can be noted that knowledge management is the process of creating, publishing, and applying knowledge in order to achieve organizational

goals. In another definition knowledge management is a philosophy which includes a set of principles, processes, organizational structures and the technology employed by people for the purpose of sharing and applying their knowledge in order to achieve their goals (Gurteen, 1999). Finally knowledge management is simply a compilation and storage of the explicit knowledge coupled with the intellectual capital management (Dalkir, 2005).

Organizational structure: Organizational structure indicates an enduring configuration of tasks and activities (Skivington and Daft, 1991). A most studied dimension is centralization (Rapert and Wren, 1998). Centralization refers to “the extent to which decision-making power is concentrated at the top levels of the organization” (Caruana et al., 1998, p. 18). Apart from a minority of studies that demonstrate a positive impact of high centralization on organizational effectiveness (Ruekert et al., 1985), the majority of scholars have agreed that a decentralized organizational structure is conducive to organizational effectiveness (Burns and Stalker, 1961; Schminke et al., 2000). It is found that a decentralized structure encourages communication (Burns and Stalker, 1961) and increases employee satisfaction and motivation (Dewar and Werbel, 1979), because in less centralized environments, free flow of lateral and vertical communication is encouraged, experts on the subject had greater say in decision-making than the designated authority (Burns and Stalker, 1961), and responsiveness to market conditions is enhanced (Schminke et al., 2000). Structure has a significant impact on the information flow and the nature of human relations. Structure defines the control mechanism (Martínez-León and Martínez-García, 2011) and it can lead to a sustainable competitive advantage for organizations, since the special skills of individuals get transmuted to apparent capabilities through structure (Daugherty et al, 2011). The relevant literature clearly demonstrates that organizational structures as business resources might be considered as a sustainable competitive advantage. Organizational structure represents a method in which information and knowledge are spread within the organization which will affect productivity. As a result, distribution and coordination of company resources will significantly influence social communications and interaction processes among the members.

Organizational effectiveness: Organizational effectiveness is “the degree to which an organization realizes its goals” (Daft, 1995, p. 98). In this study, measures assessing organizational effectiveness were adopted from Lee and Choi (2003) which encompass organizational members' perceptions of the degree of the overall success, market share, profitability, growth rate, and innovativeness of the organization in comparison with key competitors.

Goodman and Pennings (1999) believe that effectiveness is a core subject in all organizational analyses and state that a thought regarding organizations not being based on effectiveness is useless. Understanding the purpose of the organization is of the first steps that should be taken in the road toward understanding effectiveness. Organizational objectives should represent the existence philosophy as well as what it is essentially trying to achieve. The goal that most researchers consider as the most essential to success is survival which they refer to it as effectiveness criterion (Quinn & Rahrbaugh, 1983).

Organizational structure and organizational effectiveness: The structure potentially affects the organizational performance. In search for an appropriate structure that fits with organizational activities, if best methods are shared among groups for more coordination, corporate effectiveness increases (Weerawardena

et al, 2006). Structure can positively affect effectiveness and further increase it. Also it can be considered as set of decisions to be used in a variety of activities. Organizational structure has wide-ranged and predictable effects on organization effectiveness (Hao et al, 2012).

In a similar vein, despite inconclusive findings regarding the relationship between organizational structure and knowledge management (Tsai, 2002), a decentralized structure has often been seen as facilitative to knowledge management success (Gold et al., 2001). High centralization inhibits interactions among organizational members (Gold et al., 2001), reduces the opportunity for individual growth and advancement (Kennedy, 1983), and prevents imaginative solutions to problems (Deal and Kennedy, 1982). On the contrary, decentralization facilitates internal communication (Bennett and Gabriel, 1999), adoption of innovation (Miller, 1971), and higher levels of creativity (Khandwalla, 1977).

H1: Organizational structure has a significant relationship with Organizational Effectiveness.

Organizational structure and knowledge management: Structure has a significant impact on the information flow and the nature of human relations. Structure defines the control mechanism (Martínez-León and Martínez-García, 2011) and it can lead to a sustainable competitive advantage for organizations, since the special skills of individuals get transmuted to apparent capabilities through structure (Daugherty et al, 2011). It also reveals the way knowledge is distributed within the organization (Martínez-León and Martínez-García, 2011). Perrow (1967) defined structure as an agreement within individuals to perform tasks. Mintzberg (1979) accounts it as the results of a combination of all the methods through which duties are assigned to people in different tasks and are then synchronized.

scholars in different disciplines such as economics, management, physics, political sciences, psychology, management science and social sciences have a role in the description of the organizational structure and each of them has considered different aspects, however in most of them centralization and formality are included, because they believe that these aspects are more influential to organizational performance rather than others (Tsai, 2002).

Formality refers to the degree to which decisions, work relationships and norms are established through formal regulations, policies, and standard procedures and centralization refers to the degree to which decision-making by a few people in the organization who are generally top-levelled (Tsai, 2002; Daugherty et al, 2011).

H2: Organizational structure has a significant relationship with Knowledge management.

Knowledge management and organizational effectiveness: Knowledge management encompasses the managerial efforts in facilitating activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups (Rowley, 2001). Many frameworks for knowledge management processes have been identified. This study examines three processes that have received the most consensus: knowledge generation, sharing, and utilization (Davenport and Prusak, 1998). Knowledge generation refers to the process in which knowledge is acquired by an organization from outside sources and those created from within (Davenport and Prusak, 1998). Knowledge sharing, also called knowledge transfer or knowledge diffusion, refers to the process by which knowledge is transferred from one person to another, from individuals to groups, or from one group to another group (Davenport and

Prusak, 1998). Knowledge utilization, also called knowledge application or knowledge implementation, refers to the process that is oriented toward the actual use of knowledge (Gold et al., 2001). Objective theory argues that the more challenge goals, higher performance is achieved. Effective use of the challenging tasks ameliorates learning, creation of knowledge and effectiveness. This means that by assigning employees with challenging tasks, knowledge creation bases are expanded which leads to organizational effectiveness (Weerawardena et al., 2006).

H3: Knowledge management has a significant relationship with Organizational Effectiveness.

H4: Knowledge management has a mediating role in the relationship between organizational structure and Organizational effectiveness.

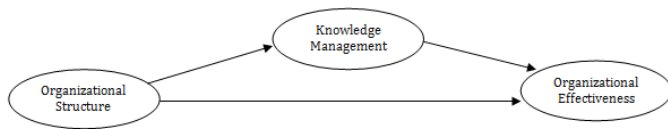


Figure 1. Hypothesized affects model

Methodology and Findings

A self-administered survey was used to collect data on organizational members' perceptions of the three constructs: organizational structure, knowledge management, and organizational effectiveness.

Data is collected through 131 questionnaires completed by managers from Mashhad's Science and Technology Park, With 0.93 Chronbach's Alpha indicating that research questionnaire is statistically reliable. Mean scores and descriptive statistics are calculated are tested through t-student test (figure 2).

Figure 2. One-Sample Statistics and t-test

Variables	N	Mean	Std. Deviation	Test value = 3		
				t	df	Sig. (2-tailed)
Organizational Structure	1313	2.62	.53	-8.29	130	.000
Knowledge Management	1313	2.18	.49	-19.38	130	.000
Organizational Effectiveness	1313	2.52	.54	-10.26	130	.000

Organizational Structure: In this test zero hypothesis is that Organizational Structure is not significant. The t-student statistic equals to -8.29 with 130 degrees of freedom and Corresponding p-value is lower than 0.05. Therefore hypothesis is to be rejected, indicating that Organizational Structure is significant.

Knowledge Management: In this test zero hypothesis is that Knowledge Management is not significant. The t-student statistic equals to -19.38 with 130 degrees of freedom and Corresponding p-value is lower than 0.05. Therefore hypothesis is to be rejected, indicating that Knowledge Management is significant.

Organizational Effectiveness: In this test zero hypothesis is that Organizational Effectiveness is not significant. The t-student statistic equals to -10.26 with 130 degrees of freedom and Corresponding p-value is lower than 0.05. Therefore hypothesis is to be rejected, indicating that Organizational Effectiveness is significant.

In order to evaluate whether knowledge management plays a mediating role in the relationship between organizational Structure and organizational effectiveness, thus H4 is to be accepted.

Figure 3. Model results for direct and mediating effects

Hypotheses		Coefficients			Sobel Test
		B	Std. Error	Sig.	Z
H4	OS to OE				2.58**
	Constant	.65	.18	.00	
	KM	.37	.07	.00	
	KM on (OS to OE)				
	Constant	.84	.23	.00	
	OS	.35	.08	.00	
	KM	.35	.09	.00	

* Significant at the 0.05 level, ** Significant at the 0.01 level

KM=Knowledge Management / OC=organizational Culture / OE=Organizational Effectiveness / OS=Organizational Structure

As you can see in Figure 3, regression coefficients are shown. We name constant coefficient's unstandardized B and Std. Error for direct effect by a and S_a and those of mediating effect by b and S_b . Considering these variables an Interactive Mediation, Sebel Test is applied to survey presumed mediating role (through comparing it with corresponding Z). Sobel test statistic is computed as following:

$$Z = \frac{a * b}{\sqrt{b^2 * s_a^2 + a^2 * s_b^2}}$$

As can be noticed, Sobel statistic exceeds Z (1.96), indicating that hypothesized mediating role is significant, thus H6 is to be accepted.

In regard to hypotheses H1, H2 and H3, Pearson Chi-Square Test along with Linear Regression analysis is utilized (Figure 4).

Figure 4
Pearson Chi-Square Test and Linear Regression Analysis results

Hypotheses		Chi-Square Test			Linear Regression	
		Value	Df	Sig. (2-sided)	ANOVA Sig.	Coefficients
H1	OS ⇔ OE	37.78**	130	.00	.00	.48** .00
H2	OS ⇔ KM	30.80**	130	.00	.00	.37** .00
H3	KM ⇔ OE	37.78**	130	.00	.00	.50** .00

* Significant at the 0.05 level, ** Significant at the 0.01 level

KM=Knowledge Management / OE=Organizational Effectiveness / OS=Organizational Structure

As can be seen, chi-square test results for H2 concludes a significant relationship between organizational structure and knowledge managements (sig. less than .05); while, linear regression results do not support presumed impact (regression sig. exceeds .05), suggesting a non-linear association between afore-mentioned factors. Despite this, results of other hypotheses (H1, H2 and H3) all support research assumed impacts.

Conclusion

The study findings shed light on several unresolved issues in the literature as stated in the Rationale section. First, besides providing empirical evidence to the connection between knowledge management and organizational effectiveness, this study suggests that knowledge management could be an intervening mechanism between organizational context and organizational effectiveness. The results support the knowledge-

based view of the firm in that knowledge management is not only an independent managerial practice, but also a central mechanism that leverages organizational structural on organizational effectiveness. It also corresponds with Penrose's (1959) opinion that the usefulness of organizational resources varies with changes in organizational knowledge. Knowledge management serves as a key leverage point in organizations.

Second, this study provides some insights in integrating the resource-based view and knowledge-based view. It reveals that the resources in an organization may be hierarchical. Knowledge may be one step closer to organizational effectiveness in the paths leading from organizational resources to organizational effectiveness. Further exploration is needed to examine this proposition.

Although this study presents substantial answers to some unresolved issues in literature, the results should be interpreted in light of its limitations. A major limitation is that the respondents were mostly the only informant from their organizations. The single informants may not represent the reality of their organizations as well as multiple informants because single informants may over-report or underreport certain phenomena (Gold et al., 2001).

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