Optimizing Knowledge In Teams: The Role Of Knowledge Orientation, Task, And Fit

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ABSTRACT:

Various scholars in economics, strategy, and organization theory have suggested that the integration of specialist knowledge is a key rationale for the existence of the firm, and that competitive advantage can result from the efficient flow of unique, valuable knowledge within the firm. Focusing on organizational teams, this paper will examine how the fit between a team's knowledge orientation (specialist or generalist) and task orientation (the manner in which tasks are processed and shared within the team) has a significant impact on the knowledge integration process, and thus on team and firm performance. Implications for future research in this domain are discussed, with a particular emphasis on top management teams and virtual teams.

Keywords: *Knowledge orientation, Task orientation, Teams*

1. Introduction

Knowledge-based views (KBVs) of organizations have become prevalent in the strategic management literature in recent years (e.g., Grant, 1996b; Spender 1996; Liebeskind, 1996). Such views hold that organizational performance outcomes are dependent at least partly on the acquisition, development, flow, and exploitation of knowledge within the firm. While these knowledge-based views have provided compelling theoretical foundations for issues such as the boundaries of the firm, superior firm performance, and optimal organization structures, relatively few studies have examined the impact of knowledge development and sharing in more focused organizational settings, such as work teams.

As KBVs have gained substantial traction in both theoretical and empirical domains of strategic management, the design of work teams has concurrently been a frequent target of scholarly study as their prevalence in organizational contexts has grown (Gladstein, 1984; Stevens & Campion, 1994; Moreland, 2000; Kirkman, Tesluk & Rosen, 2001). Many previous studies have attempted to identify the antecedents of performance in such teams, using constructs such as demographic diversity, personality and affect, and team cohesiveness. While these studies have shown promising results, they often conclude with the caveat that a team's task and other contextual factors may play a large role in performance outcomes. Though a relatively smaller number of studies have attempted to explain the optimal management and structure of such teams in terms of knowledge generation and sharing (e.g., Henderson & Lee, 1992; Faraj & Sproull, 2000), substantial uncertainty remains about the possible linkages among team member knowledge, task nature, and team performance.

This paper will attempt to address these concurrent gaps in the knowledge management and team literatures by developing propositions about optimal team designs in knowledge-intensive organizations. Specifically, this paper will briefly review the relevant literatures on knowledge management and knowledge orientation (e.g., Nonaka, 1994; Liebeskind, 1996; Leonard & Sensiper, 1998; Davenport & Prusak, 1998; Rulke & Galaskiewicz, 2000; Turner, Bettis & Burton, 2002), and task orientation (e.g., Thomas & McDaniel 1990; Tesluk et. al., 1997). Grounded in these extant perspectives, specific propositions will be developed regarding the fit (or misfit) between knowledge orientation and task orientation, and the resulting impact on team performance. These propositions offer important theoretical insights into the roles of task and knowledge structures in the team, and also practical implications for the design and management of knowledge-intensive work teams in organizations. The paper will conclude with a discussion of implications and future avenues of

research in this domain, with an emphasis on two particular contexts: virtual teams and top management teams.

2. Knowledge In Organizations

Many scholars of social science have posited that knowledge plays an important role as a rationale for the existence of the firm and a source of sustainable competitive advantage. For example, while the industrial organization economics literature has been strongly influenced by transaction-cost based views of organizational boundaries (Coase, 1937; Williamson, 1975) or property-rights (Grossman & Hart, 1985) views of the firm, Demsetz (1988, 173) proposed that organizational boundaries are largely determined by "the economics of conservation of expenditures on knowledge".

This basic premise was expanded significantly in the past two decades, as strategy and organization theorists have made compelling cases for knowledge as the fundamental building block of the organization. Grant (1996b, 112) argued that "firms exist as institutions for producing goods and services because they can create conditions under which multiple individuals can integrate their specialist knowledge".

However, while these theoretical foundations are compelling, a comprehensive knowledge-based theory of the firm has yet to be developed. Instead, the knowledge literature encompasses a rather diverse spectrum of disciplines and concepts, including organizational learning, capabilities, routines, cognition, information technology, and others.

2.1. What Is Knowledge?

One reason for the lack of a coherent knowledge-based theory of the firm is the complex nature of knowledge. Consider the most fundamental question in this area – what is knowledge? Countless authors have attempted to craft a concise definition, including:

- Justified true belief (Nonaka, 1994)
- A fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating new experiences and information (Davenport & Prusak, 1998)
- Information whose validity has been established through tests of proof (Liebeskind, 1996)
- Information that is relevant, actionable, and based at least partially on experience (Leonard & Sensiper, 1998)

While no one definition has been uniformly accepted, there are clearly some consistencies notions among these definitions. First, knowledge is often more than a simple collection of data points. Second, knowledge accumulates through experience, a process often referred to as learning. Finally, accumulated knowledge provides a basis or framework for action. For the purposes of this paper, the relevant definition of knowledge will most closely approximate that offered by Leonard & Sensiper above – *information that is relevant, actionable, and based at least partially on experience.*

2.2. Characteristics Of Knowledge

Because knowledge is so difficult to define in organizational and team contexts, a common approach in the literature has been to develop taxonomies that differentiate characteristics of knowledge without providing an intrinsic definition. Perhaps the most widely cited of these is Polanyi (1983, 4), who notes that humans "know more than we can tell". This assertion has become the basis for one of the most fundamental classifications of knowledge types – tacit vs. explicit. While explicit knowledge is that which can be easily articulated or communicated, tacit knowledge encompasses

more instinctive or subconscious processes. Because tacit knowledge is more difficult to identify and articulate, it is often considered a more valuable resource in the context of the firm (Nonaka & Taekuchi, 1995).

While the tacit/explicit distinction is widely referenced, other taxonomic schemes have emerged as well. For instance, in classifying knowledge as a strategic asset, several additional characteristics can inform the value of the asset, as well as its ease of transfer. Such characteristics include whether the knowledge is observable, complex or simple, teachable, and independent or an element of a system. Similarly, Spender (1996) distinguishes between systematic and componential types of knowledge, as well as individual and social levels of analysis. Grant (1996a) attempts to narrow these characteristics to those most relevant to the value of knowledge in the firm, including transferability, capacity for aggregation, and appropriability.

Despite this growing number of classification schemes and specialized areas of research, the basic distinction between tacit and explicit knowledge remains a dominant paradigm in the knowledge management literature. Nonaka (1994) provides several insights into the nature of both types of knowledge, and more importantly the interaction between them. According to Nonaka, the patterns of organizational interaction and transfer between explicit, easily communicable knowledge and tacit, informal knowledge can be summarized as:

Socialization – Tacit to tacit, through observation, imitation, and practice

Combination – Explicit to explicit, combining individual bodies of knowledge

Externalization – Tacit to explicit

Internalization – Explicit to tacit; similar to traditional notions of learning

At the team level, each of these interactions has a role as teams evolve. However, the extent to which they are salient dynamics for a given team will depend on the team's overall knowledge orientation, or whether the team can be characterized as a specialist or generalist one.

3. Teams Dynamics And Knowledge Orientation

While theoretical perspectives on knowledge-based views have focused largely on the organizational level of analysis, a similar logic lies at the foundation of teams in the organization – teams exist as mechanisms for mitigating the limits of capabilities and expertise embodied in individuals (Bettenhausen, 1991; Mathieu et. al., 2000). Despite this parallel with organization-level KBVs, theoretical and empirical perspectives on knowledge-based views of teams are surprisingly sparse. While a vast literature has examined team-level attributes such as task interdependence (e.g., Wageman, 1995; Wageman & Baker 1997), shared schemas (Mathieu et. al. 2000) and cohesiveness (Mullen & Copper, 1994; Guzzo & Dickson, 1996; Beal et. al. 2003), relatively little is known about the impact of knowledge orientation as a team-level driver of effectiveness.

The distinction between specialist and generalist knowledge orientations (Rulke & Galaskiewicz, 2000) represents a fundamental taxonomy of the knowledge composition of teams. A generalist team is composed of members who have accumulated a broad base of knowledge and experiences that are relevant to the team's actions. Such teams are thought to encourage *socialization* - the sharing of tacit knowledge – as individuals can more easily identify with the similarities and redundancies in their knowledge base. (Nonaka, 1994; Turner, Bettis & Burton, 2002). Conversely, members of specialist teams have developed some degree of depth in a specific skill that is relevant to the work team's actions. Specialist teams' strengths tend to lie in *combination*, the transfer and perhaps integration of explicit knowledge (Grant, 1996a).

Specialist and generalist teams can be construed as two opposite ends of the knowledge orientation spectrum. The fundamental differences between specialist and generalist teams can be visually

conceptualized in Figure 1. Consider a hypothetical team composed of four members, each with some degree of breadth and depth of knowledge that is relevant to their organization role. In the pure specialist team, each team member has significant depth of expertise in a given area, yet there is little or no overlap among the knowledge of the individual members. In the pure generalist team, members each have a broad (and thus redundant) base of knowledge in the relevant domain, yet no members have any particular depth of expertise in any one area. Between these two extremes are various manifestations of hybrid teams, composed of a mix of specialists and generalists who have both areas of redundant knowledge and areas of unique expertise.

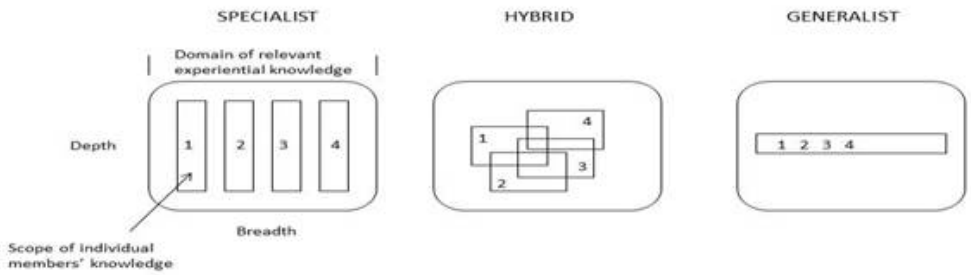

Figure 1: Knowledge Orientation Of Teams.

One might expect that these two types of teams differ along other dimensions as well. For instance, generalist teams may be more adept at quickly developing shared mental models (Mathieu, et. al., 2000) or transactive memory systems (Moreland, 2000) as a result of their overlapping knowledge and experience bases. Similarly, knowledge, skills, and abilities, or KSAs (Stevens & Campion, 1994) may differ between the two types of teams – specialist teams may exhibit more technical KSAs due to the overall depth of their skills, while generalist teams may be stronger on teamwork KSAs, due to their breadth of experiences.

The conceptualization of generalist and specialist teams as extremes on the knowledge orientation spectrum illustrates the intrinsic trade-offs between depth and breadth of knowledge in the design of work teams. For a given task, a pure generalist team could cause massive inefficiency, as much of the knowledge possessed by individuals would be redundant. A pure specialist team risks similar inefficiency, as members' knowledge bases are so diverse that communication and integration of valuable knowledge is virtually impossible. Thus, the nature of the team's task, and the flow of task work within the team, may offer critical insights into the relative effectiveness of a given team's knowledge orientation.

In sum, generalist and specialist teams represent opposing extremes of the spectrum of a work team's overall knowledge orientation, and this orientation has important implications for the design and function of teams, particularly in the context of the tasks undertaken by the team.

4. Task Orientation

One of the key limitations on the advancement of knowledge-based theories at the team level is the empirical finding that the nature of the teams' task has a significant impact on the overall

effectiveness of the team (Wageman, 1995; Wageman & Baker, 1997). Thus, a critical next step in the understanding the optimal knowledge-based design of teams is the understanding extent to which a given knowledge orientation fits with a given task. The following section will describe the notion of the team's *task orientation*, and how different approaches to task may influence other team dynamics.

Task orientation can be broadly construed as the means by which team members work interdependently to perform tasks. Tesluk et. al. (1997) describe this orientation as falling into one of four general types of work flow interdependence for a given task. First, a *pooled* orientation is one in which task performance is largely an additive function of discrete individual tasks; little interaction or coordination among members. Second, a *sequential* task flow occurs when tasks flow unidirectionally from one team member to the next, and little interaction is required. *Reciprocal* tasks occur when work flows in more than one direction among team members. Finally, *intensive* tasks require a high level of interaction and coordination of members, complex and iterative problem-solving, quick adaptation, and shared mental models. Figure 2 presents a visual representation of these task orientations. Note that the level of interdependence, or intensity of interaction among team members required to complete the task effectively, generally increases from left to right in the figure.

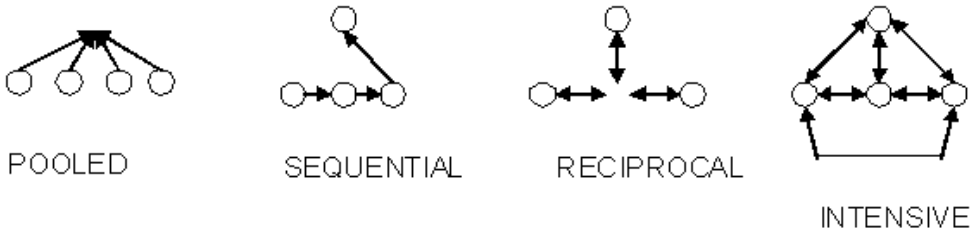

Figure 2: Basic Illustration Of Task Orientation / Work Flow In Teams (Tesluk, 1997).

These are often presented as a continuum from static, simple task or work flow structures (pooled) to dynamic, complex structures (intensive). Clearly, these four types of task orientation suggest different types of work teams to achieve optimal performance. For example, a pooled structure would require relatively little interaction among team members, as overall performance is largely a measure of each individual's performance on the task. Thus, the fit between a team's task orientation and other team-level characteristics may be informative in predicting the performance of a given team.

5. A "Fit" Perspective On Task And Knowledge Orientation In Teams

The previous sections have outlined the parallel theoretical and empirical advancements in the areas of knowledge management and team effectiveness. Yet linkages between these two streams of research are surprisingly sparse, given the relative importance of both knowledge management and teamwork in the modern organization. As a first step in addressing this gap, this section will develop several propositions regarding the optimal fit between knowledge orientation and task orientation in work teams.

The notion of fit is an integral theme of research in organization theory. At the firm level, contingency theory holds that fit among relevant factors related to internal and external characteristics of the firm will impact performance (Burton et al., 2002). The most basic type of fit is thought to be that of structure and environment, though more complex notions of fit along multiple dimensions have been developed over the years (e.g., Mintzberg, 1979).

Implicit in conceptualizations of team knowledge orientation is that certain orientations provide a better fit for certain types of tasks. The nature of work flow and information processing requirements in a given team will determine the extent of specialized or generalized knowledge required to complete the task, as well as the need for underlying knowledge dynamics such as socialization and combination.

Proposition 1: The fit between task orientation and team knowledge orientation will significantly impact the effectiveness of a work team.

For an intensive task structure, which involves highly interdependent and iterative work by team members, teams that are specialist-oriented may encounter difficulty due to their lack of significantly overlapping mental models or insufficient transactive memory. Thus, generalist teams should have an advantage with respect to intensive orientations.

Proposition 2: Generalist teams with an intensive task orientation will be more effective than generalist teams with a pooled task orientation, all else equal.

Conversely, when task orientation is pooled, specialist expertise should be particularly effective, as overall task performance is largely an additive function of individual performance. There is limited need for the development of tacit knowledge or shared schemas, as team performance is based on the cumulative specialized knowledge input of its members, rather than complex and iterative member interactions.

Proposition 3: Specialist teams with a pooled task orientation will be more effective than specialist teams with an intensive task orientation, all else equal.

The relationships between reciprocal/sequential tasks and specialist/generalist knowledge is less straightforward. As illustrated in Figure 2, reciprocal and sequential tasks require more than discrete, additive contributions of team members to tasks, yet less intense interdependence than intensive tasks. Thus, hybrid teams with both specialist and generalist member knowledge may provide an optimal fit for such tasks.

Proposition 4: For teams with a reciprocal or sequential task orientation, hybrid knowledge teams will be more effective than either specialist or generalist teams, all else equal.

These propositions are specific articulations of the broader contingency framework described earlier. As illustrated in Table 1, certain knowledge orientations represent a stronger fit with certain task orientations at the team level. Teams which achieve fit along these dimensions are expected to achieve greater effectiveness than those which do not. At either end of the knowledge/task orientation spectra, strong fits or misfits will result in either high- or low-performing teams, while other combinations may be neither strong fits nor strong misfits, resulting in moderately effective teams.

Table 1. Fit Between Task And Knowledge Orientation.

Task orientation	Knowledge orientation		
	Generalist	*Hybrid*	*Specialist*
Pooled	Low	Moderate	High
Sequential	Moderate	High	Moderate

Reciprocal	Moderate	High	Moderate
Intensive	High	Moderate	Low

6. Discussion And Conclusions

Knowledge-based views of organizations and teams have established solid theoretical foundations, upon which future empirical research must build robust descriptive and prescriptive results. Similarly, the specific role of knowledge and task orientation in the performance of groups remains largely elusive to researchers. This work addresses these issues by developing propositions on the impact of fit between knowledge orientation and task orientation in work teams, and may offer important implications for managers seeking to design knowledge-intensive teams that are configured for optimal performance.

Several areas of inquiry may prove fruitful for future research in this domain. Given the scope of the propositions in this paper, two specific areas of future research are particularly relevant in the context of teams in knowledge-intensive organizations. Specifically, the impact of virtual teams on knowledge/task fit, and the nature of knowledge/task fit in top management teams.

6.1. "Fit" In Context: Virtual Teams

First, the extent to which a team is "virtual" may have a significant impact on the fit / performance relationship in teams. In increasingly global competitive environments, many organizations have responded to the challenges of global expansion by forming teams in which membership encompasses multiple locations and cultures. These *virtual teams* are geographically dispersed work teams whose interactions are primarily through electronic means (Kristof et. al., 1995). The benefits of virtual teams are thought to include flexibility, responsiveness, and more efficient resource utilization (Moshowitz, 1997).

However, a growing body of literature suggests that virtual teams may also encounter more obstacles to success than their co-located counterparts. Such challenges include reduced communication efficiency (e.g., DeSanctis & Monge, 1999), and difficulty in building trust among team members (Handy, 1995; Jarvenpaa & Leidner, 1999). Furthermore, previous research has illustrated the challenging nature of cross-cultural interactions in teams (Watson, et. al., 1993; Thomas, 1999), which may be augmented by geographic distance among team members. As such, future research in this domain may examine whether the performance benefits of fit between a team's knowledge and task orientations may be affected by the extent to which it is co-located. Are the proposed "fits" along the knowledge/task spectrum enhanced by geographic co-location, implying that a team's virtuality may moderate the fit-performance relationship? Conversely, are misfits augmented by the inherent difficulties of virtual team membership?

6.2. "Fit" In Context: Top Management Teams And Dominant Logics

The role of knowledge and task orientation among top management teams also merits further investigation. Many scholars in strategic management have noted the importance of "knowledge relatedness" among top management teams, but few attempts have been made to test such propositions.

While the notion of the dominant logic has persisted as a foundational explanation of the diversity/performance relationship, empirical tests and theoretical extensions of this phenomenon have been somewhat limited. Such studies are undoubtedly constrained by the complex, multi-dimensional, and intangible nature of the focal construct.

A key assumption of the dominant logic is that its configuration must match the degree of strategic variety of the firm's endeavors. Strategic variety reflects more than simple product or market diversity, but the degree of similarity in the strategic characteristics of the firm's business units. When strategic variety is low, (businesses are strategically similar), a single dominant logic should be

effective – i.e., a single shared mindset for making critical resource allocations and other strategic decisions is most efficient, as the key strategic dynamics of the disparate businesses are largely the same. However, as strategic variety increases, via structural changes in existing businesses or the acquisition of new lines of business, a single dominant logic becomes less effective at critical governing firm-wide decisions and processes.

Given the previous discussion of the nature of specialist and generalist teams, one might expect that specialist teams will tend to converge toward a single dominant logic - the strength of specialist teams lies in their ability to transfer explicit, extant knowledge, but they are limited in their abilities to create and integrate the new knowledge required for the formation of multiple dominant logics. Furthermore, each member's depth of experience in a particular knowledge domain, and unfamiliarity or discomfort with alternative domains, may increase the tendency for the team to rely on an existing logic in making strategic decisions. The extent to which fit between knowledge orientation and task orientation in TMTs impact the effectiveness of a given dominant logic would represent a potentially insightful next step in this literature.

6.3. Limitations

While the propositions offered previously suggest several other areas of inquiry, empirical progress on knowledge/task orientation in teams is undoubtedly constrained by several factors. First, in the contexts of management teams (and especially TMTs), one assumes that some level of generalist experience is a prerequisite for positions at the executive level in many firms. How can future examinations account for this relative invariance in knowledge orientation? Second, though multi-item scales represent a relatively direct method for gauging a team's knowledge orientation, methodologies other than questionnaire/scale measurement may be necessary to inform the reliability and validity of the underlying measures (Campbell & Fiske, 1959; Pedhazur & Schmelkin, 1993). Possible alternative measures, such as simple counts of MBAs vs. PhDs, years of functional experience, and general management experience may be required to for more robust measures of the degree of generalist vs. specialist expertise present in a given team.

Third, is fit between knowledge orientation and information structure relevant in all contexts? Perhaps some teams exhibit effectiveness even in contexts that would be characterized as "misfits" by the criteria used in this study – if so, what are the drivers of such success? For example, it is reasonable to expect that certain teams develop routines of efficient interaction over time which may serve to alleviate any of the misfit effects discussed previously. Finally, there are certainly other aspects of team dynamics – e.g., longevity, development of routines, and cohesiveness – that would condition the fit/performance relationship proposed previously. Determining the impact and contextual variation in the fit/performance relationship in teams would offer more robust prescriptive implications for optimal team design in knowledge-intensive organizations.

These limitations are consistent with the broader difficulties involved in measuring and aggregating knowledge in organizations. Many empirical studies of knowledge management use broad firm-level variables such R&D expenditures or patent counts at the organization level, which are rather coarse measures of knowledge productivity. Effective measures of team-level knowledge orientation must account for the nature of team members' knowledge *inputs*, independent of (1) team-level knowledge outputs, such as productivity and (2) organization-level measures inputs which do not account for specific team dynamics. One of the key constraints of the study of knowledge in the firm is the often difficult task of crafting operational variables that are both sensible and readily quantified. Developing knowledge measures that are relevant, accurate, and generalizable is a key to the advancement of the literature in coming years.

Ultimately, though knowledge / task fit is certainly an important aspect of organizational knowledge management, effective management of the internal flow of knowledge involves more than simple manipulation of team structures and design. It can also include developing a knowledge architecture for the firm (Brown & Duguid, 1998), effectively deploying information technology (Davenport & Prusak, 1998), and even mapping the firm's internal flow of knowledge. Thus, while knowledge /

task fit may enable more effective teams, truly effective knowledge sharing and knowledge management strategies involve a confluence of factors to which managers must attend.

6.4. Conclusion

While knowledge-based views of the firm have established solid theoretical foundations in the past two decades, more specific implications for optimal knowledge management at the team level have been sparse. This work proposes an initial step toward addressing this issue by offering propositions related to the knowledge orientation and task orientation of teams. As the work team becomes increasingly prevalent in the larger organization context, understanding how effective teams acquire, develop, and share knowledge represents a critical next step in knowledge management for scholars and practitioners alike.

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