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The role of membership change on knowledge transfer in groups

ABSTRACT

Groups can capitalize on knowledge to the extent that it is shared among its members. However, groups are in constant flux as its membership structure changes with new members joining and others exiting continuously. In this paper, we examine the effects of membership change on the knowledge flows and stocks within the group. Specifically, we focus on membership changes that involve the replacement of an oldtimer by a newcomer that joins the group. We argue that membership change affects the extent of knowledge transfer, the type of knowledge transferred and the knowledge stock held by the group. Specifically we focus on two dimensions of knowledge: component (technical) and architectural. Firms may benefit from recognizing these relationships and differences on the pool of knowledge held to improve knowledge flows in groups and enhance their performance, namely their innovative ability.

Keywords: membership change, newcomer, knowledge transfer, knowledge, turnover.

INTRODUCTION

Groups are the building blocks of organizations (Choi & Levine, 2003) and they undertake responsibilities ranging from providing support to Top Management (e.g., giving advice) to actually giving and implementing decisions (e.g., setting the strategic direction of the organization and assisting with daily operations) or undertaking specific activities (e.g., manufacturing, innovation and new product development). In the modern organizations the human capital is acclaimed as the most important asset but the membership changes (usually referred to as turnover) may erode at least some of that value.

Groups experience a variety of changes related to their tasks and technology (McGrath, 1997) as well as changes in their membership structure. Membership change comprises "any departure from the *status quo ante* in the boundaries of the group and in the positioning of members in relation to those boundaries and to one another. It includes fleeting changes (temporary absence from a group meeting, temporary change in leadership) and permanent changes such as turnover" (Arrow and McGrath, 1995: 376). Membership changes may take other forms, such as visiting positions, but we focus specifically on those permanent changes when one individual exist the group and other joins to replace him. While the impact of membership change is likely to be pervasive in virtually all kinds of groups, it is probably more profound in small groups as well as in knowledge intensive groups such as medical research labs, product development groups, or task forces (where members depend on one another either to accomplish the task jointly or to share ideas and knowledge to improve individuals' tasks and performance).

Previous research has acknowledged that membership changes affects the functioning of the group (e.g., Arrow & McGrath, 1993; 1995; Argote, Gruenfeld, & Naquin, 2001). Change in membership may modify group processes by altering routines (Gersick & Hackman, 1990), conflict, task focus, group cohesiveness and group performance on certain types of tasks (Arrow & McGrath, 1995), established norms and patterns of interaction. The movement of individuals into group or organizational boundaries

comprises one of the primary means of importing knowledge into these groups or organizations (Rothwell, 1978; Galbraith, 1990; Almeida & Kogut, 1999). Notwithstanding, it is less clear how membership changes influences the knowledge stocks and flows that are essential not only for knowledge intensive tasks, such as innovations, but also for the daily operations (see also Arrow & McGrath, 1995). In this paper, we focus on membership changes that involve the replacement of oldtimers by newcomers¹ as one of the factors that may affect group processes and outcomes.

In this paper we contribute to the research on group membership and knowledge transfer by examining knowledge transfer within groups. While group learning, organizational learning, and knowledge management literature have gained momentum in recent years (Argote, Gruenfeld & Naquin, 2001), the intersection of these literature with those of membership change is scarce at best. Hence, we draw from concepts introduced in the macro-organizational literature (i.e., those of strategic management research), including the concept of component and architectural knowledge, on socialization (e.g., Moreland & Levine, 1982), newcomer information seeking (e.g., Morrison, 1993), newcomer innovation (e.g., Levine, Moreland, & Choi, 2001), and knowledge transfer and learning in groups (Argote et al., 2001), to explore the impact of membership change on knowledge flows and stocks in work groups. While membership change may be disruptive and cause the group to loose some knowledge (given that someone exits the firm), such a turnover may also represent an inflow of novel knowledge that was not previously held. However, the extent of that inflow is not clear. Hence, we need to understand to what extent is that knowledge disruption important. Also, understand which type of knowledge is affected. Finally, what types of knowledge flows should we truly expect to occur from the newcomer to the group and from the group to the newcomer.

Exploring these questions is important for a variety of reasons. First, knowledge transfer among group members has performance implications.

¹ We refer to newcomers to indicate individuals that are recent additions to groups. We refer to oldtimers to indicate those group members who are already existing members of the group.

For example, groups that rely extensively on knowledge sharing to carry out tasks successfully may suffer a decrease in their knowledge stock and, thus, a decrease in performance when some members leave.

MEMBERSHIP CHANGE AND KNOWLEDGE

A membership change in a group occurs when a member joins or exits a group. The newcomers play an active role in producing changes in the groups or organizations they join (e.g., Levine et al., 2001; Choi & Levine, 2003). In particular, it is often suggested that they bring in fresh ideas and perspectives and generate innovations, which Levine and Moreland (1985: 144) define as "any significant change in the structure, dynamics, or performance of a group". These innovations may help improve the performance of the groups they join. Choi and Levine (2003) argued that newcomers could facilitate innovation unintentionally through causing other members to (a) change work practices to accommodate the newcomer's limitations, (b) try new work practices if newcomers possess task expertise, and (c) identify problems in the group and develop solutions as they are socializing newcomers (cf. Sutton & Louis, 1987). Newcomers can also facilitate innovation intentionally by producing innovation themselves (Choi & Levine, 2003). Many of the innovations occur as newcomers interact with other members and transfer the knowledge needed to establish new work practices, change current work practices, or identify problems in the group and in the processes.

Similar to research on newcomer innovation (e.g., Levine et al., 2001), the socialization research has established that newcomers play a proactive role in gathering information from the group (e.g., Morrison, 1993). Newcomers seek a variety of information such as technical information (Comer, 1991) from the groups they join. In fact, newcomers not only seek information from group members but they also provide information and know-how, such as best practices and experiences drawn from previous assignments. By providing this knowledge base, newcomers may help improve the work practices of the group. As such, newcomers are likely to lead to an inflow of novel knowledge to their groups increasing the group's

knowledge stock they share their knowledge with other members. Hence, in line with the received wisdom we formulate a base case proposition:

Proposition 1. *Newcomers joining a group is likely to lead to a transfer of novel knowledge to the group, increasing the stock of knowledge in the group.*

Albeit the mere suggesting that new additions to a group may result in the transfer of novel knowledge is not new, it far less evident the intricacies of the knowledge transfer and the types of knowledge transferred. Knowledge transfer may occur from a newcomer to the group but also in reverse: from the group to the newcomer. Moreover, while the effects of membership changes are likely to be pervasive in all kinds of groups, it seems reasonable to suggest that they are more pronounced in small knowledge intensive groups, such as product development groups or task forces, where members depend on one another for a joint completion of the task. Take the case of a medical research lab where members need to share information and knowledge to help one another perform their tasks more effectively. It is therefore important to observe the types of knowledge that come into play.

Type of knowledge

Newcomers play a proactive role in the groups they join, for example, by seeking information (Miller & Jablin, 1991). In a survey conducted on new accountants one, three, and six months into their jobs, Morrison (1993) found that newcomers sought technical information mainly by asking others. However, seeking information is not necessarily a one-way interaction. While newcomers seek information, they may also give or share information intentionally or unintentionally. For example, the newcomer may inquire about how to perform a given task (that is, seek technical support) and in the process teach the ways s/he used to do a similar task in a prior group. The newcomer, thus provides novel technical input and insights to the group. Alternatively, the oldtimer may identify the problems or inefficiencies in the way s/he is carrying out a task while showing and communicating the newcomer how to do that task. While the first example

depicts a newcomer directly giving information, the latter depicts the newcomer indirectly producing a change in the way the oldtimer carries out the task. It is worth noting that in these examples, the knowledge transfer from the newcomer to the group will be mostly technical in nature.

Transfer of component knowledge

Technical or component knowledge includes specific knowledge resources, skills, and technologies that are attributable to identifiable parts of an organizational system rather than to the whole (Tallman, Jenkins, Henry & Pinch, 2004). As Tallman et al. (2004: 264) further articulate, this component knowledge may be described as:

“For instance, scientific, technical, engineering, and design skills are very much component knowledge in technology-oriented industries. Component knowledge in consumer industries includes knowledge of consumer behavior, marketing, sales, promotion, and so forth, while the motion picture industry would require knowledge of production, direction, cinematography, acting, and many other technical aspects of film making... [Component knowledge] is relatively coherent and definable, and is usually acontextual, reflective of underlying exogenous natural or societal phenomena and laws rather than personal or organizational history... Component knowledge is potentially transferable to informed individuals and organizations, which is to say that they are likely to be aware of the knowledge and that they will find it understandable once presented to them (McGaughey, 2002).”

At the group level, component knowledge also exists, but the way it is located and shared may take a different form. In sum, component knowledge applies to the more technical tasks of performing a job, how to do it and what needs to be done to do it.

We suggest that the newcomer's contribution to the group mainly takes the form of component knowledge that s/he acquired during a prior

work experience or academic studies. This component knowledge, as described above, may be characterized by its technical nature and is manifested in specific information, know how, or valuable idiosyncratic skills. For instance, the newcomer can teach oldtimers a new technique used in his or her previous group assignment or point to some of the inefficiencies in the way things are done (e.g., the way information is kept or the techniques that are used) drawing on his or her prior experience. Between what the newcomer knows and what she can know through her access to outside resources (e.g., access to networks she previously established) the newcomer may hold a substantial stock of technical knowledge that she might share with the group.

However, one might argue that since in the event of a replacement there is an oldtimer exiting the group there could be a decrease in the stock of technical knowledge within the group. Although this might seem plausible, since one of the team members exits the group, it is important to note that as group members spend more time together and share knowledge, they become more and more homogeneous. Knowledge is internally transferred, it is diffused, and perhaps to the point where each individual member does not hold any proprietary knowledge. That is because over time, each member carries less knowledge than s/he did when s/he first joined the group – perhaps with notable exceptions in very technical and knowledge-intensive fields, where individuals are very specialized in specific components of knowledge. Hence, even if the exiting member causes the group to lose some of its stock of component knowledge, it seems reasonable to suggest that the newcomers' experience in previous similar or relevant groups, his new unique component knowledge, plus the knowledge that was already internally passed on, outcomes to an increase in the overall stock of component knowledge of the group. In other words, the newcomer can bring in more component knowledge than that the exit of an oldtimer may subtract to the group due to prior internal transfers.

Thus, in proposition form we suggest that:

Proposition 2. *Group membership change is likely to lead to a positive net transfer of component (or technical) knowledge from the newcomer to group.*

Proposition 3. *Group membership change is likely to lead to the increase in the stock of component knowledge of the group.*

A membership change may involve the replacement of one group member by another: one joins the group while other leaves the group². This dual change is likely to affect the pool of knowledge within the group in two ways. First, a new entry may increase the pool of component or technical knowledge in the group because the newcomer may bring in a wide array of unique prior knowledge on how to perform the required tasks, as well as other forms of knowledge and know how (e.g., academic education, prior work experience, and so forth). We examined this aspect of turnover in Proposition 2. Second, the exit of a member may originate not only the loss of some component knowledge but also may impose the loss of another form of knowledge - architectural knowledge - in the group, which we discuss next.

Architectural knowledge

The concept of architectural knowledge at the firm level was recently advanced by Tallman and colleagues (2004: 267) who stated that “architectural knowledge, characterized as routines (Nelson & Winter, 1982), organizational resources (Barney, 1991), core competencies (Prahalad & Hamel, 1990), or dynamic capabilities (Teece et al., 1997) provides competitive advantage by offering unique, firm-specific ways to organize component knowledge and other assets to deliver unique value to customers (Henderson & Clark, 1990).” In this paper, we extend Tallman et al.’s (2004) conceptualization and apply it to a group within the firm, to understand knowledge transfer at a more micro level. Just like

² A replacement signifies two events: 1) exit of an oldtimer, 2) replacement of oldtimer by a newcomer. In all it is identical to the traditional concept of turnover, even though turnover *per se* does not entail the replacement.

organizations, it is possible that groups generate architectural knowledge, which adds up to the broader architectural knowledge developed at the firm level.

Similar to architectural knowledge at the firm level, architectural knowledge at the group level is also probably specific to each group. Architectural knowledge in a group is generated over time, and may be succinctly described as the general understanding of the established ways of doing things, how work is organized to bring about best practices, the competency of the group in performing certain activities or in organizing component knowledge. Architectural knowledge within the group goes beyond what group members individually know and can bring to the group. That is, it goes beyond individual bits and pieces of component knowledge. Architectural knowledge encompasses managerial skills, a broad understanding of how things work, how expertise or knowledge is organized or distributed in the group, who the group members refer to for specific issues, and how power is distributed within the group. Being idiosyncratic to the group it is not transferable to other individuals or groups outside the specific group's boundary. In a nutshell, architectural knowledge glues the group together, makes it effective and unifies the more micro, or component, processes.

Architectural knowledge is not only specific to the group, but it is also intangible, tacit (Polanyi, 1967), complex, sticky (Szulanski, 1996) and ambiguous (Simonin, 1999), and very difficult, or perhaps impossible, to codify (Nonaka, 1994; Simonin, 1996; Szulanski, 1996). How do small groups create architectural knowledge? For architectural knowledge to build, group members must share a past together since architectural knowledge is path dependent or history-based in nature (Nelson & Winter, 1982; Tallman et al., 2004). Tallman et al. (2004) suggested that no two organizations share the same history; therefore, no two organizations share the same architectural knowledge. Likewise, every group has a unique history and a unique path in developing its architectural knowledge.

Architectural knowledge is not easily transferable to others outside the group, but it also does not transfer easily to newcomers. That is because it

is idiosyncratic to each group and it evolves over distinctive learning processes and activities that are specific to the group, and it forms the basis of core competencies and established routines. This type of knowledge is highly contextual and grows through how things have happened or the way everything is related to everything else. The architectural knowledge is absorbed by the newcomer gradually, over time and through trial and error, observing others, asking questions, and generally interacting with others in different situations.

How is the pool of architectural knowledge affected by membership changes? As group members experience membership changes, these can alter the architectural knowledge in the group since new or different sets of relationships form among group members. For example, an exit of an oldtimer may affect the communication flow within the group (e.g., who goes to whom for questions, problems or advice) or the way tasks are organized (e.g., which responsibilities are assigned to whom). Consequently, group members may lose some of their broader understanding of how things work in their group since things may start to work differently once the oldtimer leaves. Each group member knows less about how the group functions as a whole. In other words, with the exit of an oldtimer, the architectural knowledge in the group decreases and needs to be redesigned. The group members are left to re-structure their architectural knowledge, which will again be altered when a newcomer joins the group and causes a new set of relationships to form in addition to, or to replace, the existing ones.

Some of the architectural knowledge oldtimers possess is common knowledge among group members. For example, group members might go to the same person for a specific set of questions, as they are all aware that the knowledge they are searching for resides in that particular individual. However, some of the architectural knowledge oldtimers have acquired over the years might be unique to themselves. For example, an oldtimer might have learned over time through experience that this particular member of the group is less grumpy, even helpful on certain times of the day, or days of the week. Therefore, this oldtimer might have an idea for when to approach this particular person for questions or advice in addition to when

to avoid him or her. This kind of knowledge, which relates to the overall, architectural understanding of how the group works, is not accessible by the remaining group members once the oldtimer leaves if the oldtimer did not share this knowledge. In other words, the architectural knowledge in the group decreases as group members lose access to the unique architectural knowledge the exiting member accumulated over time.

In sum, a membership change, whether it involves or not a replacement, may lead to a decrease in the group's architectural knowledge in two ways. First, the exit of an oldtimer ceases some of the prevailing relationships in the group (e.g., the network of relationships the oldtimer formed with others in the group are no longer there), while others need to be formed (e.g., the remaining oldtimers go to a different person for advice). As a result, the group members' understanding of how the group as a whole functions, decreases since a new set of relationships comes to define the group. Second, when the oldtimer leaves, the remaining members lose access to the oldtimer's unique architectural knowledge on how group members work together, work is organized, expertise is distributed, how group members share component knowledge, or how the group generates and utilizes innovations. As the oldtimer leaves, this knowledge is not immediately accessible by the group anymore. Therefore, a member exit signifies a loss in architectural knowledge, which cannot be easily replaced by a newcomer. However, to make the newcomer fully operational, the core attention needs to be in transferring architectural knowledge. To summarize, we advance the following proposition:

Proposition 4. *Group membership change is likely to lead to a decrease in the stock of architectural knowledge of the group.*

Proposition 5. *Group membership change is likely to lead a primary effort in transferring architectural knowledge to the newcomer.*

DISCUSSION AND CONCLUDING REMARKS

The ability to share and transfer knowledge is crucial to organizations' competitiveness (Bhagat et al., 2002). Knowledge sharing has been noted as a source of technological evolution (Appleyard, 1996), and firms'

competitive advantage (Grant, 1996; Kogut & Zander, 1993; Tallman et al., 2004). Recognizing the importance of knowledge flows, organizations such as Hewlett-Packard and 3M encourage their employees to share and transfer knowledge (Goh, 2002). These organizations are known to reward employees who share knowledge that is utilized by another employee or group to improve products or work processes (Goh, 2002).

Our paper, albeit theoretical suggests that we need to understand what is the actual impact of membership change in the knowledge stocks and flows in groups and organizations. Rather than a simple suggestion that bringing in new members adds up to the knowledge held, we strive to understand what is the overall impact of membership changes. It seems reasonable to suggest, as we did, that although the pool of component knowledge may increase, the architectural knowledge is likely to decrease. Without the structural support of architectural knowledge, the more technical, or component knowledge may render ineffective. This is more salient for groups in knowledge intensive activities – such as the medical research labs, product development teams, and so forth. These types of groups tend to experience frequent turnover, which may influence, for example, the way knowledge is managed within these groups.

We built upon the concepts of architectural and component knowledge from the field of strategic management and sought to adapt them to a group context, perhaps a small group context. We sought to advance a set of theory-driven propositions to highlight the impact of membership changes in the groups. In pursuing this line of enquiry we analyzed the extent and type of knowledge transfer within the group. Particularly, we started from a proposition setting a link between membership change and knowledge transfer. Our conceptualization illustrates that membership changes may not only affect the level of knowledge transfer within the group, but also the type of knowledge that will be transferred, which can create changes in the knowledge stock within the group.

We contributed to the stream of research on knowledge transfer in a variety of ways. First, we focused on knowledge transfer within groups, which has received little attention from scholars, although notable

exceptions such as Gruenfeld, Martorana and Fan's (2000) work exist. Second, although research examining how membership changes affect group learning and performance has recently gained momentum (Argote, Gruenfeld, & Naquin, 2001), little is known about how changes in membership may affect knowledge transfer in such dimensions as the stock of knowledge, and the type of knowledge transferred. In addition, research on the effects of membership changes on learning have placed more emphasis on turnover (e.g., Argote et al., 1990; Argote, Insko, Yovetich & Romero, 1995; Devadas & Argote, 1995; Virany, Tushman & Romanelli, 1992), socialization (e.g., Feldman, 1976; Van Maanen, 1976; Van Maanen & Schein, 1979), and newcomer information seeking (e.g., Ashford & Cummings, 1983; Morrison, 1993), than on newcomer innovation (e.g., Levine et al., 2001; Choi & Levine, 2003) or newcomer knowledge transfer.

Future research should extend our focus. For instance, it may examine how groups react to frequent membership changes. Moreover, groups may lose more than one member at a time, while other members may be promoted, and therefore, their status in the group may change. While we sought to simplify the complexity of the phenomena at hand, future research may deal with different forms and frequencies of membership change. We also extended on a concept that had its origins in the strategic management research – architectural and component knowledge – but organization behavior scholars may seek constructs that are better suited to study micro level effects such as understand knowledge transfer in groups.

Although researchers and practitioners alike have emphasized the role of knowledge transfer within and among individuals, groups, or organizations, more research is warranted to understand the factors that facilitate or impede the transfer of different types of knowledge. Every organization is subject to membership changes as its members exit, retire and get promoted. Membership changes may have a pervasive impact on the overall performance of the organization. Future research might examine who is being replaced. For instance, what are the implications for knowledge transfer when an expert or a key player in the group is replaced? And, what happens when a member leaves and is not replaced? Finally, it could be interesting to look at the role managers or leaders play in knowledge

transfer within the group. For example, how do managers or leaders affect knowledge transfer within the group, and what happens when they are the ones who are replaced? If it seems reasonable that management scholars and managers need to better understand how firms are impacted upon by membership changes, a further focus is warranted to understand and disentangle the multiple intricacies binding people together in groups.

A clear understanding of the perils and benefits of membership change requires a focus on the gains and losses of knowledge. The organizations of the future seem to rely more heavily on their human capital and their ability to innovate, recreate and invent novel processes and products.

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