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Dual allegiance, knowledge sharing, and knowledge protection: An empirical examination

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Abstract: This paper tests empirically a previously developed proposition that the allegiance of individual research and development employees to either their own firm or the external research and development collaboration in which they participate or to both these entities influences their knowledge sharing behavior. Analyzing original data collected through 50 interviews that took place in 2011 and 2012 in the research and development units of two global firms in Finland, the United States, and China we confirm that there is such a relationship. We also confirm that allegiance types can be classified as four distinct types – lone wolves, gatekeepers, gone natives and company soldiers. Each type leads to certain behavior in terms of knowledge sharing and/or knowledge protection.

Keywords: dual allegiance, knowledge sharing, knowledge protection, R&D collaboration

1 Introduction

Over the last few decades there has been a significant increase in the use of both formal and informal R&D collaboration (Bouty 2000; Hagedoorn, 2002), with external networks being widely used by R&D active firms of all sizes. In fact, the use of inter-organizational R&D collaboration has changed from being of peripheral relevance to being a basic foundation for most firms' R&D-strategy (Duysters, Kok & Vaandrager, 1999). There are several factors that contribute to the explosion of external networks in R&D (Miotti & Sachwald, 2003). Knowledge production is becoming increasingly multidisciplinary, international and dispersed over organizations and institutions (Granstrand, Patel & Pavitt 1997; Nowotny, Gibbons, & Scott, 2001). In rapidly developing technological areas no single firm possesses all competences needed for generating innovation breakthroughs. Instead, knowledge creation and innovation demand a combination of skills and abilities that normally exceed the capabilities housed in a single corporation (Powell, Koput & Smith-Doerr, 1996). The declining cost of monitoring and exploiting networks (Narula, 2004) and the rapid pace of technological change requires that firms take advantage of R&D inter-organizational collaborations in order to further develop their organizational capabilities, innovate and maintain competitive advantage.

When firms engage in inter-firm collaboration, in fact, it is employees who collaborate on behalf of their respective firms. Against the background of this fact, it is surprising how much research has been conducted on inter-firm collaboration at organizational and network level and how little at the level of individuals. Over the last few years there have been numerous calls for conducting studies that can provide more insights into the micro-foundations of various phenomena, including inter-firm collaboration and knowledge sharing.

A recent conceptual paper by Husted and Michailova (2010) addresses inter-firm collaboration by focusing on the individual level and theorizing about R&D workers' knowledge sharing behavior when they participate in external R&D projects. The authors argue these employees develop a particular pattern of allegiance – they tend to either develop a unilateral allegiance (to their own firm or to the inter-firm collaboration), a dual low allegiance or a dual high allegiance. The argumentation continues by proposing that depending on their allegiance type, R&D workers behave differently in relation to knowledge sharing.

In the present paper we empirically examine the above theoretical propositions. We are interested to find out empirically 1) *whether indeed R&D employees deal with allegiance issues when they participate in external collaborations on behalf of their firm;* and 2) *whether this allegiance impacts their knowledge sharing behavior.*

Like in the original conceptual paper by Husted and Michailova (2010), we specifically focus on R&D collaborations as they are understandably the most fertile setting to study knowledge-related processes – R&D experts possess valuable knowledge and when they participate in inter-firm R&D collaborations, this is primarily due to the knowledge they possess. The access to external knowledge is often based on an exchange principle where firm employees have to put in some knowledge to contribute to the collaborative project in order to gain knowledge which can be beneficial for their own firm.

Examining empirically the link between allegiance and knowledge sharing behavior is relevant in terms of both research and practice. Research wise, we see value in empirically testing a proposition that has been only theoretically grounded and supported by anecdotal evidence, but has so far been left without a systematic examination. We also extend the theoretical contribution of the previous study by explicitly including also knowledge protection instead of solely focusing on knowledge sharing. In terms of practical relevance, employees' knowledge sharing behavior can be either detrimental or beneficial to their firm and the firm's overall strategy, especially in relation to what the firm wants to gain from the particular collaboration. In other words, while executives have a clear idea and objective about what they want to achieve from participating in a collaboration, this idea and objective can be either accomplished or compromised depending on the allegiances of employees engaged in the collaboration.

The remainder of the paper is structured as follows. In the next section we introduce the theoretical platform of our study. This consists of a brief overview of the concept of dual allegiance, some observations in relation to knowledge sharing and protection and finally, linking dual allegiance, knowledge sharing and knowledge protection. In section 3 we present our research design and explain in detail how we have collected our empirical data. The subsequent section is devoted to our analysis and findings, followed by a discussion and conclusion.

2 Conceptual background

2.1 *Dual allegiance*

Research on dual allegiance¹ surged in the 1950s, with scholars asking whether it was possible for employees to be committed to both the organization that they work for and the union to which they belong, without the commitment they have for one entity affecting feelings towards the other entity (Dean, 1954; Purcell, 1954, Stagner, 1954). Purcell (1954: 49) defined allegiance as “an attitude of favourability towards the company or union as institutions, or general approval of their overall policies”. The relationship between allegiance to the union and to the company has remained the most studied form of dual allegiance. While positive correlations were found between these two forms of allegiance (Angle & Perry, 1986; Dean, 1954; Fukami & Larson, 1984; Purcell, 1954; Reed, Young, & McHugh, 1994; Snape & Chan, 2000), it was also concluded that if workers feel that the company is working against the union, their allegiance to the union is likely to reduce their allegiance to the organization (Purcell, 1954). In other words, dual allegiance is most likely to occur when the demands that two entities place on an individual are compatible. When they are contradictory, employees will identify with the goals of one entity over the other and favor the one that provides the greatest reward and least punishment for their allegiance (Rosen, 1954).

There has been a lack of clear definition of what dual allegiance entails and how this should be measured (Gordon & Ladd, 1990). Definitions range from “a characteristic of workers (i.e., those who are highly loyal to both company and union), a relationship between two variables (i.e., attitudes towards company and union), or a situationally dependent phenomenon” (Gordon & Ladd, 1990: 42). Despite the lack of a widely agreed upon definition, research has examined the antecedents and outcomes of allegiance (Fukami & Larson, 1984) and started considering whether contract workers could be allegiant to a primary employer and a client organization (Connelly, Gallagher & Gilley, 2007), whether they can be allegiant to different areas of the same organization simultaneously (Cooper-Hakim & Viswesvaran, 2005), how expatriates can be committed to local operations and headquarters (Gregersen & Black, 1992) and the ways in which employees can be committed to international joint ventures

¹ The term “allegiance” is often used interchangeably with “loyalty”, “commitment” or “identification” despite the fact that these constructs have been found to be associated with different antecedents and outcomes, (Gordon & Ladd, 1990). Similarly, the dual allegiance literature has been criticised for using the terms “dual allegiance”, “dual loyalty” and “dual commitment” interchangeably. We use the term “allegiance” and “dual allegiance” throughout.

and the companies involved in them (Johnson, Korsgaard & Sapienza, 2002).

2.2 Knowledge sharing and knowledge protection

Bearing in mind that knowledge sharing always happens at the micro level, between individuals, it is interesting to note how little research has actually been conducted on the knowledge sharing and protection related behavior of employees, and the governance of that behavior. The knowledge management related literature has made rather limited use of concepts and frameworks related to people management and HRM practices (Hislop, 2003; Storey & Quintas, 2001). There have been a handful of papers on HRM and employee related knowledge protection (Baughn et al., 1997; Hurmelinna-Laukkanen & Puumalainen, 2007; Liebeskind, 1996, 1997; Norman, 2001). Those have mainly discussed these issues from the knowledge protection rather than the knowledge sharing side. Some studies have examined the risk of knowledge loss related to leaving employees (Boxall, 1998; Campbell et al., 2009; Holloway, 2007; Hofer-Alfeis, 2008). We argue that building up on these existing studies, there is a substantial room for conducting research that examines both knowledge sharing and protection instead of just one of these processes.

2.3 Dual allegiance, knowledge sharing and knowledge protection

The conceptual study by Husted and Michailova (2010), which we put to the test, positions R&D employees along two dimensions - their allegiance to their own firm and to the R&D collaboration – and identifies four types of R&D employees. The authors label them ‘lone wolves’, company soldiers, ‘gone natives’ and ‘gatekeepers’. Company soldiers are individuals with a stronger allegiance to their own firm as compared to the collaboration and are therefore less inclined to share knowledge with colleagues from the collaborating firms. Quite the opposite to them, gone natives are more allegiant to the collaboration than to their own firm, and so, they may engage in too much knowledge sharing with the collaboration partners. Husted and Michailova (2010) also suggest that individuals with low allegiance to both their company and the collaboration, the lone wolves, are driven primarily by their self-interest and hence, are likely to be careful, strategic and calculative in terms of whether, when, with whom and to what extent they share the knowledge they possess. Finally, the authors propose that gatekeepers - individuals who maintain a balance between a high level of allegiance to both their own organization and the collaboration - are typically the ones who have a thorough understanding regarding knowledge sharing in different contexts and for different purposes and hence, they are more likely than others to find win-win solutions for all parties. Gatekeepers are powerful in deciding which knowledge and when is appropriate to go

outside the firm boundaries and often they are the recipients of external knowledge that is transferred from collaboration partners (Chesbrough, 2003; Hurmelinna-Laukkanen & Puumalainen, 2007). It is gatekeepers' task to pass on such knowledge back to their own company.

Failure in sufficient knowledge sharing could lead to the company not being able to realize the intended benefit from the collaboration (Husted & Michailova, 2010). On the other hand, excessive knowledge sharing could lead to loss of core knowledge and thus limited chances for future competitiveness by core knowledge-based innovations. Therefore, the allegiance of the employees and the knowledge sharing/protection behavior related to their allegiance is of great relevance to companies in R&D collaboration.

In the next section we present the design of our empirical study, followed by the analysis of our data.

3 Research design

The first research design issue we considered was the selection of companies where we could conduct the data collection. Our key selection criteria were: serious engagement in R&D activities, involvement in inter-firm R&D collaboration, and having an explicit innovation strategy. We have opted for conducting the study in two global firms. One of them operates in the ICT industry and the other in the high-tech engineering industry. Both firms are headquartered in Finland and have R&D units in the US and China. Each company employs tens of thousands of people worldwide. The units examined of the ICT company focused exclusively on research, and the units of the engineering company were involved more widely in R&D. The units varied somewhat in terms of their size, from dozens of employees working on research to hundreds of employees in the units with combined R&D.

In order to empirically examine R&D workers' allegiance and how it relates to knowledge sharing and protection behavior, we conducted an "inquiry from the inside" (Evered & Louis, 1981). In line with such an inquiry, we engaged with the studied settings rather than staying detached and distant from them. Also, while we had certain categories in mind (allegiance, knowledge sharing, knowledge protection, collaboration), we did not have strongly predefined ideas and conceptions of how they are related; instead we were genuinely interested in learning about these relationships from our research participants.

Following such an objective and approach, we found a qualitative methodology to be most appropriate. This choice was embedded in a few important considerations about the open-ended nature of our research questions, the state of existing research on dual allegiance and knowledge sharing, and the intended contribution we sought to make (see Edmondson & McManus, 2007; Thomas, 2004). Our research questions called for detailed, fine-grained descriptions and interpretations by R&D workers in the studied organizations. Following Van Maanen's (1979: 520) definition of the purpose of qualitative research, we aimed to "describe, decode, translate or otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world".

Ideally, we would have opted for conducting interviews and participant observations over a prolonged period of time. However, due to the fact that most respondents were in locations (not only countries, but also continents) different from ours as well as because of time and funding constraints, we have decided that conducting face-to-face interviews would best serve us in terms of answering the research questions. As we have focused on one particular method, we also were aware that a serious effort had to be invested into conducting a substantial number of interviews so that we do not compromise the internal validity of our study.

In 2011 and 2012 we conducted 50 semi-structured face-to-face interviews in the R&D units of the two selected firms in Finland, the US, and China. As summarized in Table 1, we conducted 30 interviews in the engineering company and 20 in the ICT company. Basis for selection of employees for the interview was that their work involved being in contact with external partners in various forms and being involved in external knowledge sharing. The respondents were employed at four different levels in their respective companies - strategy, management, immediate superiors and operative personnel (i.e. R&D engineers). The interviews lasted between 90 and 120 minutes each. When conducting them, we tried to get as close as possible to our respondents' understanding and interpretations of the issues of their allegiance and how this may be related to their knowledge protection and knowledge sharing behavior. The interviews were recorded and transcribed verbatim.

Level & Industry	<i>TEAM</i>		<i>MANAGER</i>	
	Operative employees	Immediate superiors	HR, legal, R&D managers	Strategy level managers
High-tech engineering	8	7	8	7
ICT	10	4	4	2

Table 1 Interviewees' position and industrial affiliation

The two-industry and three continent sample enables wider analytical generalizability of the results. We used deductive content analysis to examine complexities of R&D collaboration both at individual and organizational level and how the challenges could be managed.

4 Analysis and findings

Our examination of the empirical data reveals that knowledge sharing takes place in networks of people and situations where personal attributes, personal relationships and social norms play an important role in guiding individual decisions whether to share or protect knowledge in inter-firm networks.

We empirically confirm the existence of four types of allegiance of R&D employees as outlined by Husted and Michailova (2010): Lone wolves with low allegiance to both own company and to R&D collaboration, gone natives with low allegiance to own company, but high allegiance to R&D collaboration, company soldiers with high allegiance to own company and low allegiance to R&D collaboration, and gatekeepers with high allegiance to both own company and the R&D collaboration.

4.1 Lone wolves – low dual allegiance with opportunistic knowledge sharing and protection behavior

In a few interviews we have identified lone wolves. What clearly transpired in these interviews was internal competition and jealousy over expertise and skills as well as keeping own connections to oneself for potential later benefit, both internally in the firm and in collaboration relationships. Lone wolves tend to put their personal career above all and use knowledge attributes to build their own status or leak knowledge out of frustration. One type of a lone wolf could be the employee who said ‘I just want to design stuff in my own little world.’ Describing lack of team player skills – a quality that seems quite easily forgiven for an important and innovative employee, as was noted by the person’s colleagues’ attitudes towards this particular lone wolf as they described him as ‘a good employee’ and ‘good R&D engineer’. Another interviewee cited a rather different opinion than most of the others: ‘Sense of responsibility is generally rather low. No one here would have a problem leaving if a competitor paid 10% more,’ which could be interpreted as opportunistic behavior to benefit one’s own career and benefits.

In some cases knowledge seems to be withheld even internally in the firm, causing frustration as expressed by two team level employees: ‘Inexperienced R&D people tend to withhold information to prop up their own position,’ and ‘Maybe somebody is particularly good in some area and likes to hold everything close to them. Even in superior positions.’ A team leader revealed: ‘Internal knowledge sharing is challenging. There is not enough of it.’ Through the interviews it became evident that managers tried to encourage employees to share knowledge internally. It is worth noting that lone wolf type of employees were mostly referred to exist at the team level, not at the higher levels within the organization: ‘They do come back and ask me, if they feel I have information they are seeking for, and I will

share this information with them. Even if I don't have enough time for it, I will,' said one of the managers. It is worth noticing that pressure from family and friends could lead to lower allegiance to the company and to search for a better offer, as was found in the interviews in the engineering company's Chinese unit: 'Once people get married, they need the money. After a few years of work, there is the pressure to buy an apartment,' said one of the interviewees. 'They stay in the company, but try to find a good opportunity. In practice, if they'd have another company promise a better salary, they would leave,' said a team leader. 'Perhaps some people are not so internally motivated. People just come to work and then leave,' remarked a team member. 'Loyalty is the oldest value of Chinese people. Younger people are more self-centered and also want to gather information from all over the world.' This observation by a team leader indicates a general lower allegiance to the company by younger employees.

In sum, lonely wolves indeed seem to exist in companies although they are not a majority. Our findings suggest that they are found more frequently at team levels, rather than managerial levels, and that there may be more lone wolves in the younger age groups looking for an opportunity. Based on our analysis we suggest that there is a connection between being at younger age and working at lower positions in the organization, and having lower allegiance with the company and the collaboration. Further, the allegiance towards one's own company could rise with the experience in the company, with lowering levels of self-seeking behavior and concentrating on the best of the company. However, clearly this could also be related to the personality of an employee as not everyone even wants to proceed in their career to managerial positions.

4.2 Gone natives – high allegiance to R&D collaboration and low to own company, with a risk of too much external knowledge sharing

We found gone native R&D workers among our respondents. They are focused on the actual outcome of the collaborative endeavour and are not necessarily concerned about the strategy of their employing firm. Taking (potentially excessively great) risks to benefit the R&D collaboration is identified as typical role behavior of the gone natives. Our data reveals that although many of the R&D employees make decisions based on their knowledge of what is wanted from them, some of them tend to make individual decisions to 'share everything that is needed, and seeing later whether it pays off'. According to an operative employee, 'we have to share everything related to technology, otherwise we can't create anything. And our partners have signed NDAs.' Many of the managers sense this as a potential risk in terms of exceeding limits for safe knowledge sharing, as can be seen from a manager's concern: 'For the project managers, it is most important to get the job finished, not to protect the knowledge'. Excessive

knowledge sharing behavior has been identified to happen among employees: ‘Among the people in collaboration interface – we don’t tend to give access rights just in case – we try to limit the knowledge in the minimum needed,’ pointed out one team leader. ‘Decentralization of the knowledge helps to mitigate the risk of leaks,’ noted a manager.

As Husted and Michailova (2010) note, the knowledge risks related to gone natives are not relevant only in too much knowledge being leaked, but the low allegiance with own company could also result in the employees leaving and taking knowledge with them. ‘We used to have another unit, and they got rid of many, many people. You have to wonder how loyal is the company to you,’ said one of the operative employees, which could be interpreted as a sign of low allegiance towards own company caused by disappointment with the earlier actions of the management. One of the operative employees described himself as being: ‘not loyal to the company, but loyal to profession.’ ‘Key people have not left so far. But it is a huge risk, which must be covered,’ said a manager. ‘We would like our employees to be more committed. You know, even if they know they’re not going to have a good day at work, they would still like to stay,’ said one of the managers, a sign, that perhaps some of the employees do not have such high allegiance to their own company. Low allegiance with one’s company and the related knowledge leaving could be somewhat of a bigger risk in the ICT industry: ‘In IT industry choosing a new job in a new company is quite frequent,’ noted one of the team leaders in the Chinese unit. ‘Work motivates, not the firm,’ said one of the operative employees in the US unit suggesting lower allegiance with the firm, than with the work as such.

In our analysis we found that gone natives may not constitute a large group, but they are a rather risky group. As they have low allegiance to their own company, and a high allegiance to the collaboration, they are likely to share too much knowledge externally. Managers have found decentralization of knowledge and limiting of critical knowledge sharing as means to control the risk. Also, the risk of leaving is greater with these types of employees. They seem sometimes to be suspicious about the loyalty of the company towards them and this, in turn, increases the risk of employee leaving.

4.3 Company soldiers – high allegiance to own company and low allegiance to the collaboration; a bit too good at knowledge protection

We also identified a group of company soldiers from the interviews - R&D employees strictly loyal to the company and ‘sometimes too good at protecting knowledge’. ‘People are more in the protective stand. They will rather tell too little than too much. Sometimes one has to push them to be more open,’ noted a manager. ‘Protection can easily go overboard. Then people don’t spread even the good things around as openly, but just do their

thing in a small group. That hinders development,' said one of the operative employees. These employees, who could be good in firm-internal knowledge sharing, may fear that any amount of knowledge shared outside could be too much, and therefore could consciously protect the firm knowledge leading to only limited inter-firm knowledge sharing and thus potentially also to limited innovativeness. Low trust with the partner, together with high allegiance to own company, creates company soldier-like behavior: 'Trust in suppliers takes time to develop. And they often hide financial information that we would need. Because they are small, family-owned, not public,' said a manager.

It was not difficult to identify company soldiers among our respondents. 'I feel like they somehow care about me,' said one of the operative employees referring to his company. 'I like my job and colleagues. I'd like to be much more proud of my company and much more involved. Sometimes I feel like the company doesn't want me to,' said another interviewee. 'If a special employee gets a recognition, they will not tell others who might feel jealous. These employees are very good, they are committed to their work. They are really engaged with the company,' said a manager. A team leader told a story: 'My wife laughs at me, because I always tell her how good our products are. 'It's not your company', she goes, but she doesn't have this loyalty towards the company like I do. – I'm very proud to work for this company.'

Our analysis suggests that company soldiers exist mostly at the lower levels of the R&D organizations. However, we note that there is a contextual element to this. Certain situations, such as an open knowledge sharing culture could have an effect on managers needing to have more employees exercising this type of allegiance. Perceived caretaking from the side of the company may enhance the allegiance to the own company. High allegiance to own company can limit the actually wanted knowledge sharing with external partners – or even firm-internally – unless the company soldiers are supervised and encouraged to knowledge sharing.

4.4 Gatekeepers – maintainers of the precious balance between knowledge sharing and knowledge protection

It was relatively easy to identify gatekeepers who are able to maintain a balance between a high level of allegiance to their own organization and the collaboration in the studied company units. However, they were not so frequently positioned at the operative level; instead we were able to identify them at the superior and manager levels. While the conceptual study by Husted and Michailova (2010) suggested that these are a minority, in our study they were the most common of the four types.

The trusted role as gatekeeper was possible to detect when respondents talked about autonomy and acknowledgement of one's responsibility in knowledge sharing, for example. The employees had quite a bit of autonomy, and they were trusted when making knowledge sharing decisions in collaboration: 'We are highly autonomous. We make share-or-not-to-share decisions ourselves. If I were in the gray area, I would ask my supervisor – that would not be a problem,' said one of the team leaders. 'When you're in code committees, you sometimes need to stop and not say something because competitors are listening to see if someone will say too much,' said an operative employee. Another example of being able to balance between the company's and the collaboration's benefit is told by a research employee: 'I have communicated with professors at [university]. I would tell them what I'm doing [in the company]. I think the communication between us is good for the company, as they will see what we do and that we are excellent in what we do.' Describing the employee's role as gatekeeper can be seen from the operative employee's further reflection: 'You need to share knowledge in order to succeed. But being an employee of [the company], you have to be faithful to the company.'

Yet, the role as gatekeeper was not an obvious one as the Gatekeepers themselves found that it was challenging to balance between enough sharing and protection. 'Knowledge sharing is a challenge, because we have to balance between enough protection and not harming opportunities to work,' noted one manager. 'For sure it has happened that we've shared too much information, because we sometimes notice ourselves information shared by a partner will suddenly help us to solve a problem. Sometimes we notice that we should've told something earlier to the partner that just presented you with the same result that you already knew before starting the collaboration.' The challenges of balancing between adequate knowledge sharing and not sharing too much seem to be relevant on many levels, as the team leader continues: 'I think even in the manager positions it is sometimes difficult to draw the line, because you always want to get the best possible solution, and want to share enough, but on the other hand not too much.'

We found that high interest towards the content of the work was present with high allegiance with the own company, as well as the collaboration. Many of the managers mentioned interesting tasks and challenges for employees in creating internal motivation and allegiance with the own company, but also with the task at hand and the collaboration related to that. It could be that these employees would try to make good decisions related to knowledge sharing benefiting the company, that allows them to work on interesting projects and tasks. According to an operative employee: 'I think the company is a good place to work because they offer

us opportunity to do challenging things in technology. It is attractive for people who want to do meaningful things in their career paths.'

We find that being a gatekeeper relates to being satisfied with the work at many levels. 'I don't care about pay or promotion, I just love this place, position, environment and colleagues,' said an operative employee. 'The people committed to the company, the people with sense of duty, try to do their best, and won't like to jeopardize the action and success of the company with any of these [knowledge leaks] actions,' said a team leader.

Superiors also knew how to avoid hampering employees' autonomy: 'If a superior tells their team off for sharing certain information, in the future they will come and ask the superior every single issue. So, even you might be bothered about the employee telling some of the things they have, you have to think whether or not it is a good thing to comment on that,' said a team leader. We think that this person is obviously a gatekeeper, with high allegiance to their own company, with ambition to make their team learn to share enough, but not too much knowledge to partners. 'Sometimes my team members would come and check something with me [in relation to inter-firm knowledge sharing], and of course we encourage that. Whenever you are uncertain, do come and discuss. I'm trying to coach people.' Gatekeepers are coaching gatekeepers: 'The role of immediate superior is essential when trying to raise the people to the culture of knowledge sharing. It is the intermediary between employees and management,' noted a manager. 'The younger employees learn by watching the more experienced. When in negotiation with external partners, they can see the level of disclosure where the more experienced employee drew the line,' agreed a team leader.

'The starting point is that we are very careful when in collaboration. But then those who know the goals and aims, can be more open. It is usually the management who decides in the end about the limits,' said a manager. Thus, it seems that especially in the ICT industry company, there was a certain amount of autonomy with the team level employees, who could make share or not to share decisions on their own, and also always knew what to do in case of uncertainty. 'Protection is everybody's responsibility.' 'People are professional enough not to hurt the company,' said a team leader in the ICT company. Our data reveal that the ICT industry company was quite good in building allegiance with the company by several means, the most important mentioned being the work-related factors (interesting and challenging), as well as giving responsibility to make decisions independently and providing guidance when needed. Thus, most of the ICT-company team level employees seemed to be well informed and cautious in the effects of their actions.

5. Discussion

We were interested to empirically find answers to our research questions of 1) *whether indeed R&D employees deal with allegiance issues when they participate in external collaboration on behalf of their firm; and* 2) *whether this allegiance impacts their knowledge sharing behavior.*

Our analysis suggests that employees indeed deal with allegiance issues when they engage in external collaboration on behalf of their firm, even if it is not always such a conscious act. These groups of employees can be identified based on their thoughts on and experiences in knowledge sharing and protection related issues. It can be challenging to manage a lone wolf, who may not be interested even in firm-internal knowledge sharing unless it will benefit him/her personally. Or it could be harmful for the company if over-enthusiastic gone native R&D people with high allegiance to their profession and their work, and thus also the collaboration project where they are involved, would openly share knowledge, without caring about the possible consequences. Lone wolves and gone natives were mostly found on the team level of the organization, and were largely absent on the manager levels.

There are risks caused by overly-protective company soldier who may not want to take a risk of sharing almost anything in collaboration in being cautious not to harm their own company with too much knowledge sharing. Too tight knowledge protection can thus lead to failure of the collaboration if such a person was in a key position to make decisions and not carefully encouraged to share knowledge. Company soldiers were mostly found at team levels, and in some market areas, especially China, there may be more of company soldiers also on manager levels because of different needs in knowledge protection.

Gatekeepers on the other hand are usually good at the uneasy task of making decisions of whether to share knowledge or not. They have high allegiance to both the company and the collaboration and have understanding of what the collaboration needs in order to achieve its goals and how that collaboration also benefits their company. Gatekeepers can be most often found at the upper levels in the company. However, from the empirical data it could be seen that the companies, especially the ICT-company, had gatekeepers on all levels of the company. In fact, the ICT-company had realized the importance of employees knowledgeable of their responsibilities and limits for knowledge sharing and was grooming new gatekeepers with guidance from supervisors.

It seems that allegiance to own company is relevant in two phases of knowledge sharing: first, for employees to be able to balance between knowledge sharing and protection – not sharing too much or leaking information that is not supposed to leak out, and second, for the employees

to be committed to the company long-term, and giving their best effort for the company.

Based on our analysis, we find that allegiance types are likely to differ on the following dimensions: 1) in terms of the level at which organizational members are employed, 2) their experience in R&D collaborations, and 3) the superiors' and managers' guidance on sharing and protecting knowledge and control thereof. Different from Husted and Michailova's (2010) conceptual study, we find that gatekeepers are a majority of the allegiance types recognized in research-based organizations (rather than a small group) and they are found at all hierarchical levels rather than exclusively at upper managerial levels of the organization.

6. Conclusion

The study contributes to the emerging research on micro-foundations of knowledge sharing as earlier advocated by Foss et al. (2010). While most studies so far have dealt with organizational level knowledge sharing practices, we emphasize the importance of individuals who actually make the decisions whether to share or protect particular knowledge when they engage in inter-firm collaborations. We empirically examine the dual context of knowledge sharing in collaborative R&D settings as well as confirm the existence of four main allegiance types on the basis of original data generated in a cross-industry and cross-country sample. To the best of our knowledge, this is a first effort of this kind.

As such, the study provides a starting point for further research on managing the knowledge sharing behavior of different types of R&D employees according to their allegiance to the collaborative project and the company.

Managers struggle in their decision making regarding not only what specific form of R&D collaboration to opt for, whom to select as partners and how, in how many collaborations to engage, etc., but also how to manage the already existing ones, and moreover, how to manage their R&D employees to the collaboration endeavour's best possible performance. These collaborations are multifaceted and inherently ambidextrous and this makes them particularly challenging from a managerial perspective.

If managers understand well the allegiance patterns of their employees engaged in external R&D collaborations, they will be able to develop and apply the respective mechanisms in terms of how to manage these employees so that the objectives of the collaboration are achieved and aligned with the overall strategy of the firm. Our study thus offers valuable advice on the reasons that lead to certain type of behavior within R&D collaborations and how this behavior can be managed best.

This study has its limitations. Firstly, as the data was collected in two industries only, it cannot be widely generalized. At the same time, we would argue that since we interviewed 50 respondents from three different continents in a two-industry sample, we are able to provide valuable new information of the phenomenon. Secondly, while interviewing was an appropriate method to utilize bearing in mind the nature of our research questions and the status of prior knowledge regarding the phenomenon of investigation, it still remains a single method, with its own inherent limitations. If more time and other resources were available, the data collection and analysis would have benefited from longer stay in the studied units and conducting observations over an extended period of time. Conducting triangulation would have increased both the validity and the reliability of our study. We have tried to mitigate the weakness of applying a single method by doing our best to conduct a relatively large number of

interviews, but see high potential in utilizing alternative methods either separately or in combination with interviews to understand better the interface between dual allegiance, knowledge sharing and knowledge protection.

It is well established that allegiance is not a permanent or static state of affairs. An employee's allegiance to own company and to collaboration is likely to change over time and it would be contingent on various factors, such as the type of the collaboration, the expert as well as the hierarchical status of the employee and their experience from previous collaborations. Looking carefully into the dynamic aspect of the establishment and development of allegiance patterns would be an interesting and relevant path for further research.

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