

## **ON THE RELATIONSHIP BETWEEN ORGANIZATIONAL SIZE AND FORMALIZATION OF KNOWLEDGE TRANSFER PROCESSES**

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**Abstract:** In spite of the fact that the ability to transfer knowledge is critical for securing a firm's competitive advantage through leveraging scarce internal resources, few investigations have been conducted to date to systematically explore intra-firm knowledge transfer processes put in place by small firms operating in turbulent environments. Drawing upon an exhaustive cross-case analysis of a set of knowledge transfer processes within five small software firms, we found that these processes exhibit striking differences in their degree of formalization in two firms of equal size. Contrary to the conventional belief held by many scholars in the literature that assumes that the degree of process formalization increases in direct proportion with firm size, our results demonstrate that the major factors explaining the variance in the degree of formalization of intra-firm knowledge transfer processes are the CEO personality, firm age, and availability of venture capital.

**Keywords:** Knowledge Transfer, Organizational Size

### **1. Introduction**

Over the last years both scholars and practitioners have started to increasingly recognize that knowledge has become the most important asset in organizations (Grant, 1996; Nonaka and Takeuchi, 1995; Teece, 2005). Knowledge can augment the value of firm resources and boost organizational ability to compete in today's fast-moving environments. The maximization of internal knowledge can be achieved through an effective intra-firm knowledge transfer that can be defined as a process through which a source conveys knowledge to a recipient who learns and puts into action the transmitted knowledge (Argote et al., 2000). Knowledge transfer allows firm employees to learn from each other setting the ground for new knowledge creation that ultimately contributes to the augmentation of the organizational knowledge base (Murray and Peyrefitte, 2007).

To date, intra-firm knowledge transfer processes have been widely explored in the context of large multinational corporations by authors such as Kogut and Zander (2003), Minbaeva (2007), and Szulanski (1996). Despite the significant role that small and medium enterprises (SMEs) play in the economic development of any country being an important source of employment, innovation and national wealth-creation, the dynamics associated with knowledge transfer activities within SMEs have received only limited analytical attention from scholars in the knowledge management field (Thorpe et al., 2005; Wong and Aspinwall, 2004). Moreover, the vast majority of extant studies on knowledge transfer processes in the context of SMEs have focused on identifying factors that facilitate or impede knowledge transfer activities in these firms (Egbu et al., 2005; Wong, 2005; Wong and Aspinwall, 2005).

In this paper we report the findings of a systematic investigation of internal knowledge transfer processes within five small firms employing less than 100 employees and operating in the Canadian software industry. Relying on both primary and secondary sources of data, we identify a set of processes put in place by small firms in order to transfer knowledge internally. Through an in-depth cross-case analysis, we found that the explored knowledge transfer processes exhibit striking differences in their degrees of formalization.

Attempting to explain the varying degrees of process formalization across firms, we draw upon the existing literature which suggests that the formalization of intra-firm processes increases in direct proportion with firm size (Matlay, 2000; McAdam and Reid, 2001; Spence,

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1999). However, the results of our investigation demonstrate that organizational size falls short of commonly held expectations and cannot adequately explain the reported differences. Even though the smallest firm in our study exhibits a significantly lower degree of process formalization compared to the largest firms, we show that two sample firms of equal size display extremely opposite degrees of formalization of knowledge transfer processes. In conclusion, we advance three explanatory factors, namely CEO personality, firm age, and availability of venture capital, which allow understanding the differences in the degree of process formalization between small firms.

## 2. Method

Given the fast-moving nature of the software industry and the complexity of internal activities in organizations operating in this sector, we adopt an exploratory multiple-case study approach (Patton, 2002; Yin, 2003). Due to the scarcity of empirical evidence on our research topic, this methodological approach is the most appropriate for exploring different knowledge transfer processes in small firms and analyzing the factors that permit to explain the variance in the degrees of process formalization across cases. A total of five firms were retained in our study (i.e., Adoma, Asiris, Acora, Adonis, and Apolon) as they satisfy the criteria for inclusion in our sample. All firms operate in the Canadian software industry, are primarily involved in software development activities, and have less than 100 employees.

To gather our data, we relied on both primary and secondary sources of data. Primary sources include semi-structured interviews and non-participant observations. All interviews were conducted face-to-face and lasted 90 minutes in average. At least three interviews were performed in each firm with various representatives of the executive team. The interviews were recorded, transcribed, and coded into prevalent patterns and categories using content analysis (Ghauri and Grønhaug, 2005). The main goal of non-participant observations we made in each firm was to observe people's behavior, visible culture, and group interactions in daily activities. As far as secondary data sources are concerned, we used internal organizational records and publicly available documentation.

To conduct our analysis we first built individual case studies in order to get familiar with the particularities of each firm. Then, we made a cross-case comparison to identify commonalities and divergences among the explored firms. Having identified four different intra-firm knowledge transfer processes in our sample firms and observing a high variance in their degrees of formalization, we subsequently evaluated the degree of formalization of each knowledge transfer process by assigning a category from a continuous five-level scale. The categories on this scale range from 'low', 'medium/low', 'medium', 'high/medium' to 'high', where 'low' means that the degree of process formalization is insignificant, whereas 'high' indicates that these knowledge transfer processes are very formalized in a given firm as compared to the rest of the sample.

## 3. Results

Our interviewees in small firms identified four important processes that are used for transferring knowledge internally: (1) meetings; (2) project teams; (3) interactions with customers; and (4) IT-tools.

### 3.1. Meetings

Adoma and Acora score highest on the degree of formalization of the meetings' process aiming at transferring knowledge internally. There are four different types of meetings that are organized in these firms, providing good opportunities for informing employees about different organizational issues and exchanging explicit knowledge throughout the company. The need of conducting very formal meetings is underlined by the executive team of both

firms, as they allow increasing the predictability of organizational actions and reducing the uncertainty and risk.

Asiris and Adonis present a 'medium' and a 'medium/low' level of formalization on this process, respectively. As opposed to Adoma and Acora, both Asiris and Adonis put in place two types of meetings. It is worth noting that the frequency of meetings in Adonis is higher with meetings being held weekly, while in Asiris "formal presentations" are organized monthly and "intense teaching sessions" – every two weeks. Contrary to the rest of our sample firms, Apolon exhibits the lowest degree of formalization on this knowledge transfer process.

### 3.2. Project teams

Adoma and Asiris score highest on the degree of formalization of project teams' process of intra-firm knowledge transfer. Managers of these firms specified that 'top-down indications' and 'system teams' are used as formal means for fostering intense transfer of knowledge among team members. Acora uses 'multidisciplinary teams' as an alternative way for transferring knowledge among the members of project teams. However, the nature of these teams at Acora appears to be less formal compared to the previous two firms, with no pre-determined steps to follow, resulting in a lower amount of knowledge transferred via this means. This difference explains Acora's 'high-medium' level of formalization on this knowledge transfer process.

Adonis and Apolon score lowest on the degree of formalization of the project teams' knowledge transfer process. While we found some evidence of formal means at Adonis, none was depicted at Apolon, justifying their 'medium/low' and 'low' rankings, respectively.

### 3.3. Interactions with customers

Adoma and Acora present the highest level of formalization on the 'interactions with customers' process of knowledge transfer. At Acora customers play a critical role during the software development process and the regular feedback the company gets from them is constantly incorporated in its activities. In addition to that, Acora managers highlighted the importance of the annual seminar conducted with customers where the research and development and marketing teams pool complementary resources to address emerging issues and experiment on new technologies.

Given that interactions with customers are less frequent at Asiris compared to Adoma and Acora, the company presents a 'medium' level of formalization on this process. The lack of constant formal feedback from customers justifies Adonis 'medium/low' level of formalization on this knowledge transfer process. The only formal procedure which allows Adonis to interact with a potential customer is through a 'validation process' which occurs when the firm involves in a new field of exploration.

### 3.4. IT-tools

Adoma scores highest on 'IT-tools' knowledge transfer process, followed by Acora, Asiris, Adonis, and Apolon. Adoma's Marketing Vice-President refers to the company intranet as a "superstructure", where all procedures are stored and disseminated throughout the company. In other words, intranet at Adoma represents a powerful tool which allows developing and safely preserving the organizational memory. As opposed to Adoma where all employees are supposed to use intranet on a daily basis, at Acora this IT-tool is employed less frequently and mostly by the members of executive team. Managers at Acora make weekly reports on their teams' achievements and post them on intranet in order to be seen by other members of the firm.

Asiris exhibits a ‘medium’ level of process formalization given that intranet usage is limited to the storage of some internal documents, presentations, and emails. At Adonis, however, intranet is used only by software developers and programmers to keep record of the ‘source code’, while the major part of knowledge transfer still occurs through more informal, tacit, and personal interaction and face-to-face communication. Finally, compared to the rest of the sample, Apolon presents the lowest level of formalization on this knowledge transfer process.

#### **4. Discussion**

By comparing our five cases, we observed that the degree of formalization of intra-firm knowledge transfer processes varies significantly across firms included in our study. Combining the scores on each knowledge transfer process exhibited in each firm, we could create a ranking of firms based on their degree of process formalization. Thus, while Apolon presents the lowest overall score, Adoma displays the highest degree of formalization of knowledge transfer processes. Interestingly, our analysis shows that these two companies of equal size exhibit opposing degrees of process formalization. These results are surprising since they are not aligned with the expectations put forward by the vast body of literature examining the relationship between firm size and organizational profile.

It is widely accepted nowadays that the degree of formalization increases in direct proportion with firm size and that knowledge management practices in SMEs, as opposed to large organizations, are very informal and incidental rather than structured and deliberate (Matlay, 2000; McAdam and Reid, 2001; Pleshko and Nickerson, 2007; Wong and Aspinwall, 2004). In our study we provide empirical evidence which challenges the commonly held assumption in the literature on firm size and process formalization. The opposite cases of two sample companies of equal size, namely Apolon and Adoma, demonstrate that this mainstream assumption does not always hold. We argue that additional factors beyond firm size, such as CEO personality, firm age, and availability of venture capital, permit to better understand the variance in the degree of formalization of knowledge transfer processes among firms.

According to Kets de Vries and Miller (1986), executive personality plays an important role in shaping organizational choices significantly affecting firm structure, strategy, and culture. Based on the comprehensive typology of CEO personality styles developed by these authors, we find that in our study the personality of Adoma’s CEO corresponds to the ‘compulsive’ pathological style, while the personality of Apolon’s CEO matches closely the ‘dramatic’ executive style. The ‘compulsive’ manager feels a strong need to control everything that surrounds him, is highly preoccupied with details, finds it difficult to deviate from pre-established routines, and has the tendency to impose on others his way of doing things. Indeed, order, efficiency, and predictability are the main concerns for Adoma’s CEO inducing him to formalize every single activity in his firm. The predominant traits of the ‘dramatic’ CEO personality at Apolon are the need for continuous action, grandiosity, excitement and new unpredictable experiences that prevent him from concentrating on one activity at a time and engaging in formalization activities.

Another factor that may explain the opposite degrees of formalization of knowledge transfer processes at Adoma and Apolon is firm age. Several authors have argued that older organizations are more likely to develop highly standardized and formalized procedures over time than younger ones (Evans, 1987; Furnham, 2005). An older firm displays a tendency to rationalize its resources and reduce uncertainty by solidifying its past lessons learnt into established organizational routines. It is worth noting that in our study Apolon has been operating in the industry for only two years, while Adoma has already cumulated nine years of existence. This important age difference between these two firms can explain the strikingly high level of process formalization at Adoma as opposed to Apolon.

Finally, we find that the venture capital availability also affects the degree of formalization of internal knowledge transfer processes. Based on the study conducted by Keil et al. (2008), who highlight the importance of venture capital in the context of small firms, we suggest that the availability of venture capital affects the type of mainstream activity (i.e., exploration or exploitation) and the firm's propensity to formalize its knowledge transfer processes (March, 1991). A company which possesses significant financial resources from venture capital investments, as in the case of Apolon, is likely to engage in exploration activities that allow experimenting on uncharted technologies and developing new courses of action. The lack of venture capital investments determines Adoma's involvement in exploitation activities in order to generate immediate returns and face short term financial needs. Therefore, Adoma involves in highly formalized knowledge transfer processes to be able to reduce future errors and secure its long term organizational stability.

## **5. Conclusion**

In this paper we focused on examining the degree of formalization of four intra-firm knowledge transfer processes in five small firms operating in the Canadian software industry. These processes are meetings, project teams, interactions with customers, and IT-tools. Observing a high variability of findings in terms of degree of process formalization among explored firms, we further discussed three factors that permit to shed more light on the divergent degrees of formalization in these firms. Contrary to the commonly held belief in the literature which claims that the degree of process formalization typically increases with organizational size, we argue that size alone cannot adequately explain the propensity of small firms to formalize their internal knowledge transfer processes. Our qualitative analysis indicates that factors such as CEO personality, firm age, and availability of venture capital may enhance theoreticians' and practitioners' understanding of the degree of formalization of knowledge transfer processes in small firms operating in hyper-competitive environments.

The results of this investigation provide several contributions of both conceptual and managerial nature. While many studies on intra-firm knowledge transfer processes have been done in the context of large multinational corporations, in this paper we seek to extend the limited body of literature on knowledge transfer practices within small firms by systematically exploring different processes of knowledge transfer and advancing three explanatory factors of varying degrees of process formalization in small software firms. One practical implication of our study is that managers in small companies should be aware of the multiple more or less formal processes through which knowledge can be successfully transferred among their employees.

Scholars analyzing business phenomena as a reflection of firm size might consider appropriate, for analytical purposes, differentiating among different firms included in the same category of small size. Since in our study two sample firms falling within the same size category, namely Adoma and Apolon, revealed extremely opposite formalization behaviors, future research efforts have to be deployed to verify whether this finding is specific to all companies of this size or it can also be replicated in other categories of small firm size. In conclusion, given the limited number of case studies included in our investigation, we believe that researchers could test the extent to which the three proposed factors affect the degree of formalization of intra-firm knowledge transfer processes on larger samples of small firms activating in various industrial settings.

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