

Explaining Knowledge Intensive Firms' Performance Through Internal Factors: Evidence from an IT Consulting firm

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Abstract: Our research contributes to knowledge-intensive firms research streams. We propose an explanation of their performance based on organizational design theory and the resource-based view. Through a case study on an IT consulting firm in France, we examined the impact of a coherent organizational architecture and a cognitive asset on the performance of the firm. The results show a complementarity between a coherent organizational design and a meticulously formed and maintained human resources asset to explain the performance of an IT consulting firm.

Keywords: knowledge intensive firms, organizational performance, organizational design theory, resource-based view, IT consulting firm

1. Introduction

The information technology (IT) sector has played an important role in the emergence of the knowledge age where information must be processed and shared as quickly as possible (Khalil & Khalil, 2020). Among the important actors of the field, we find IT consulting firms considered as a knowledge-intensive firm (KIF) (Muller and Doloreux, 2009). The information system is at the center of IT consulting firms' activities. They guide their clients towards high-performance IT solutions, provide them with expertise on their information system or support for end users through an implementation of interactive computer interfaces or mobile applications. Therefore, the success of their consulting projects depends heavily on knowledge, which explains the importance of its management (Khalil & Khalil, 2020). More specifically, it is tacit knowledge (Nonaka, 1994) or specific knowledge (Jensen and Meckling, 1992), which is relevant to decision-making, and on which depends the firm's performance. Being personal and context specific, it refers to the meaning given by a combination of information and beliefs specific to everyone. In complex organizations, fragments of specific knowledge are possessed by various dispersed agents (Fama and Jensen, 1983) who are the only ones aware of its importance (Hayek, 1986), thus explaining the high cost of its transfer. By what mechanisms do we make such knowledge available to decision-makers? How does the firm acquire such knowledge and how does it increase? Although there are studies on KIF and performance management ((e.g Khalil & Khalil, 2020; Berraies & Bchini, 2019; Greenwood et al., 2005; Løwendahl and Fosstenløkken, 2001), we propose to explain performance by combining the organizational design theory and the resource-based view, two complementary theories having as a common point: the central element of knowledge. Our choice to combine both theories aims to go beyond their restricted conceptualizations of the firm and to contribute to the literature on KIF.

2. Theoretical model

2.1 Organizational design theory

Organizational performance is a multidisciplinary research field that can be defined according to the researcher's academic orientations and choices. It can be defined in terms of value creation (Charreaux, 1998). From a traditional financial perspective, it reflects the rent received by shareholders (Charreaux and Desbrières, 1998). In other terms, to which extent a company has been able to create or is able to create more value for its shareholders than its competitors? According to the organizational design theory, a firm is performant if the agency costs resulting from intra-firm cooperative relations are minimized (Jensen and Meckling, 1976). To achieve this, the theory proposes a coherence between three blocks described by (Brickley et al., 1997) as the three legs of the stool. The first block of the organizational design theory concerns the delegation of management decision-making rights. These are the rights of decision initiation, ratification, implementation, and monitoring (Fama and Jensen, 1983), (Brickley et al., 2003). They can be grouped into two categories: decision management rights (initiation and implementation) and decision control rights (ratification and monitoring). To achieve better performance, a firm must be able to decentralize management rights to the agents holding the specific knowledge (Jensen and Meckling, 1992), (Brickley et al., 1997), (Brickley et al., 2001), (Brickley et al., 2003). In our case, given their specific knowledge, teams of consultants hold the rights to manage the projects, therefore, our first hypothesis is:

H1: The delegation of management decision rights to teams of consultants positively influences the performance of an IT consulting firm.

However, in the presence of opportunistic agents with limited rationality, decentralizing management decision-making rights to consultant teams carries risks. To minimize them, (Jensen and Meckling, 2009) advocate the use of disciplinary mechanisms in the form of a performance evaluation system. It represents the second block of the organizational design theory. This system can include subjective and objective assessments of both individuals and sub-units of an organization such as divisions or departments. A collective and objective assessment is advantageous in environments dominated by project logic and where the imperative of collaboration makes individual assessment sensitive. In this case, the consultants will be inclined to work in the interest of the principal since their evaluation would depend on the collective performance of their teams, hence our second hypothesis is:

H2: Along with delegation of management decision rights to teams of consultants, the use of collective criteria to evaluate consultants' performance positively influences the performance of an IT consulting firm.

Given the context of IT consulting projects, a post-project evaluation is not sufficient because of the commitments and delivery deadlines made with the client and the technological and budgetary means involved. Frequent monitoring of results seems to be one way to ensure that software development teams remain focused on achieving their objectives (Kirsch, 1997) in (Maruping et al., 2009); (Henderson and Lee, 1992), (Nidumolu and Subramani, 2004). Checkpoints should therefore be set up throughout the project, complementing the decentralization of decision rights to the consultants, hence our third hypothesis is:

H3: Along with delegation of management decision rights to teams of consultants, the frequent use of formal mechanisms to evaluate consulting projects, positively influences the performance of an IT consulting firm.

Alongside this formal mechanism, we postulate three types of informal controls favored by the social environment: corporate culture, social control by peers and transparency of information. By insisting on elements of culture, firms using this type of control cultivate the values and norms valued by their employees (Dreesen et al., 2020; Berrebi-Hoffmann, 2006; Alvesson and Kärreman, 2004), hence our fourth hypothesis is:

H4: Along with delegation of management decision rights to teams of consultants, the use of corporate culture as an informal control mechanism positively influences the performance of an IT consulting firm.

This environment leads also to mutual surveillance and to phenomena of reputation and sanction by the group in the case of non-conformity with the norms and values shared by all (Berrebi-Hoffmann, 2006). Through peers who are the best qualified to observe the behavior and evaluate the performance of their colleagues, management obtains information on the agents at low cost (Fama and Jensen, 1983). Therefore, our fifth hypothesis is:

H5: Along with delegation of management decision rights to teams of consultants, the use of social peer control as an informal control mechanism positively influences the performance of an IT consulting firm.

In addition, the exercise of self-monitoring is reinforced by a structure where information about personal achievements is transparent and accessible to all consultants (Berrebi-Hoffmann, 2006). We can therefore postulate that consultants who are aware of how their performance is viewed by others are forced to self-monitor, hence our sixth hypothesis is:

H6: Along with delegation of management decision rights to teams of consultants, transparency of information, self-disciplining the consultant, as an informal control mechanism positively influences the performance of an IT consulting firm.

The third block of the organizational design theory is the performance incentive system. These mechanisms motivate consultants to exceed their goals by using their specific knowledge and making it accessible to others. Agents will be rewarded according to their marginal contributions to the firm's result (Osterloh and Frey, 2000), (Brickley et al., 2001). Collective reward makes it possible to overcome the difficulty of measuring individual performance and therefore its reward (Brickley et al., 2001). It is consistent with collective evaluation and peer review. Therefore, our seventh hypothesis is:

H7: Granting financial incentives based on collective bonuses, in line with a collective performance evaluation, positively influences the performance of an IT consulting firm.

The reward and sanction system can also have a non-monetary dimension such as honor, consideration, reputation... (Jensen and Meckling, 2009) because the reward itself is not important: what matters is the value that the recipient attributes to it (Foss et al., 2015). This can be in the form of recognition from colleagues, other teams, and management and reputation (Husted and Michailova, 2002). A balance between financial and non-financial incentives is likely to have positive effects on knowledge sharing and thus on firm performance, therefore our eighth hypothesis is:

H8: Granting Informal incentives based on subjective performance evaluation positively influences the performance of an IT consulting firm.

2.2 Resource-based view of the firm

The positive effects of knowledge on firm performance have long been analyzed by proponents of the resource-based approach (Penrose, 1959; Wernerfelt, 1984; Barney, 1991, 1996; Grant, 1991). Penrose conception of the firm describes it as a collection of productive resources of administrative organization. This is what, according to the author, contributes to the profitability of the firm. In the theory of resources, an IT consulting firm is efficient if it ensures better exploitation of the services provided by its internal resources. In terms of knowledge management, (Dierickx and Cool, 1989) distinguish between two notions: the stock, reservoir or pool of knowledge and the flow of knowledge. The knowledge pool refers to the current knowledge held by the firm while the knowledge flow refers to the acquisition of new knowledge. Combining a strong employer brand with selective recruitment is one strategy to help achieve this goal (Gamage, 2014; Fulmer et al., 2003; Sutherland et al., 2002), hence our ninth hypothesis is:

H9: The constitution of a quality knowledge pool positively influences the performance of an IT consulting firm.

To maintain this quality pool of knowledge, we propose several mechanisms based on the density of social relationships in this type of organization. They are known for stimulating knowledge flows. They are knowledge-friendly culture (Mas Machuca and Martínez Costa, 2012; Heisig, 2009), communities of practice (Lesser and Storck, 2001; Lave and Wenger, 1991) and training (Chen and Huang, 2009; Bauernschuster et al., 2008), therefore our tenth hypothesis is:

H10: The maintenance of a quality knowledge pool positively influences the performance of an IT consulting firm.

In previous exploratory research among French consulting firms Partners and consultants, we have identified the agile methodology as one of the key elements emphasizing the success of IT consulting projects. In the context of IT companies, the notion of agility, as explained by Khalil (2011), refers to their ability to adapt to changes in customer demands during the project, and to master the functional scope of the project as well as the cost and quality criteria. It is a methodology conducive to self-organization and promoting adaptability. Therefore, we have integrated it to our research model as a moderating variable:

H11: The use of agile methodology in consulting projects intensify the positive influence of the disciplinary and cognitive model on the performance of an IT consulting firm.

Our research model is as follows:

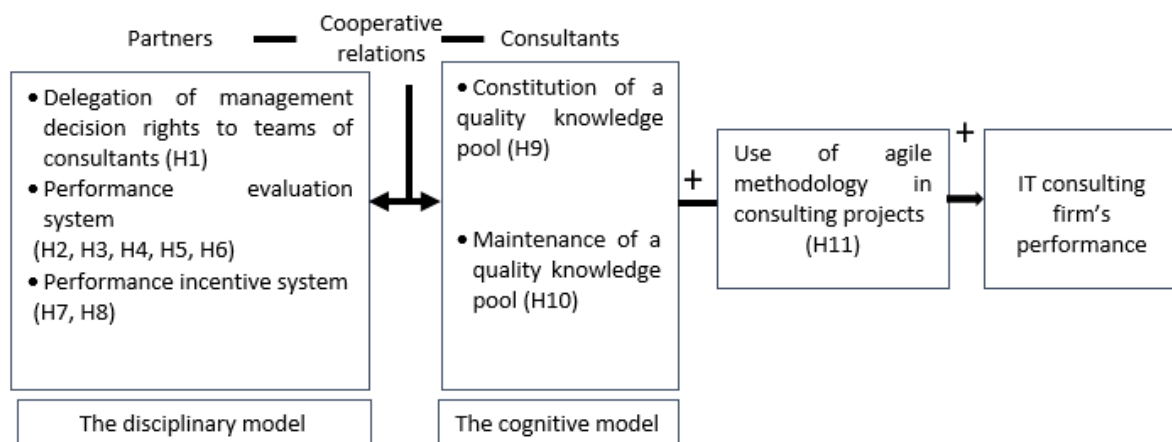


Figure 1: Our research model

Having presented our research model, we detail in the following section the results of our case study.

3. Results

3.1 Research methodology

To test our hypotheses, we chose to follow the qualitative method of the case study. We therefore chose an IT consulting firm recommended by several respondents in our exploratory phase as being in the top 10 IT consulting firms' performers in France. Our research took over a period of 14 weeks in 2020. We used data triangulation to test our theoretical model. Secondary data from the internal documentation of the IT consulting firm (intranet, mailing lists), shared by our respondents, and available on the company's websites (corporate and publications on social networks) of the IT consulting firm, along with participant observation were crossed with primary data from 35 interviews with different profiles representing a volume of 32 hours. The interviews collected were analyzed using two techniques: analysis by analytical questioning as well as analysis in writing mode.

3.2 The case study

3.2.1 LCR, a premium IT consulting firm

«Our main objective is a business company objective [...] we can consider that our development axis and our added value is to provide premium expertise in software development and therefore, we measure this quality in relation to indicators that allow us to demonstrate that we know how to deliver software quickly, but all this is just a positioning argument. The proof and relevance of our positioning is in relation to the premium level of our prices, and therefore our margin. » M. M.K, Partner. Founded in France in the 1990s, LCR is an IT consulting firm that has nearly 600 employees. Since 2014, the company has defined its internal organization mode in tribes. With a management committee of 19 Partners and a head office in Paris, LCR has regional branches in the south and north of France and an international branch in North Africa. To measure its performance, we opted for a financial indicator for its ability to display a synthetic measure of the company's overall performance over a given period. It also has the advantage of allowing comparisons (between firms or over time) due to its homogeneous calculation standards (Giraud, 2011). For this purpose, we used the indicator of commercial profitability, and therefore the operating margin. This indicator is very relevant for consultancy firms since it reflects their business model and therefore provides information on the profitability of sales. With a double-digit operating margin since 2015, the IT consulting firm is one of the most profitable companies while showing very strong internal growth. Its sales have doubled in just four years, from 38 million in 2015 to over 80 million in 2019. We will now confront the hypotheses of our theoretical model with data collected.

3.2.2 Decentralized but highly monitored and controlled consulting projects

The first block of our theoretical modelling concerns the disciplinary mechanisms of the agent holding the specific knowledge. First, we postulated that due to the cognitive limitations of the principal (the partners), better decision making depends on the delegation of management decision rights to consultants who are best able to deal with the client's problem. What about the actual process of managing a consulting assignment at LCR? By cross-referencing the internal documentation with what the consultants said, we can see that the actual process of managing a consultancy assignment at LCR follows the four stages of the theoretical model recommended by Fama and Jensen (1983) except for the initiation phase. In the context of LCR, this is not fully delegated to consultants. In fact, the search for a consulting project (by mutual agreement) or in response to calls for tender is carried out by the partners (the principal) or by the consultant (the agent). The latter, in partnership with a business consultant, then selects the offers in line with the firm's orientations. The ratification stage corresponds to contract signing by a Partner (the principal). The implementation stage is delegated to consultants (agents) who are responsible for carrying out the project. In the final stage, these agents are monitored using a combination of frequent control by the project manager and various monitoring committees.

They are supported by experts external to the project in case of detection of delays in the achievements, dissatisfaction of the stakeholders or any other difficulty. Considering these results, we can deduce that project management rights are partially delegated to consultants (agents) while decision control rights are held by the principal (the partners) and the project manager. We, then, can corroborate partially our first hypothesis.

Secondly, we emphasized that delegating management decision rights to consultants can only contribute to the performance of an organization if it is consistent with a performance evaluation system that disciplines potentially opportunistic agents with limited rationality (Jensen and Meckling, 2009). The criteria of performance evaluation of the consultants within this IT consulting firm are directly linked to collective

achievements. The annual evaluation of the consultant depends on the performance of his tribe as well as that of LCR. In other words, it is a question of evaluating on the one hand the achievement of the operating margin target by tribe up to 50%, and on the other hand, the participation of the tribe in the achievement of the operating margin of LCR up to the remaining 50%. We can therefore conclude that this evaluation mechanism is in line with our theoretical hypothesis and has the advantage of favoring both intra- and inter-team collaboration to the detriment of competition between consultants. As regards the periodicity of the evaluation of the performances of the consultants, LCR proceeds during the project to frequent evaluations relating to the technical, financial, and behavioral indicators and at the end of the year to a collective evaluation of the tribe to which the consultant belongs. We can therefore conclude that our second and third hypotheses, according to which the use of frequent evaluations and a collective evaluation of the performance of the consultants determine the performance of an IT consulting firm, are corroborated. Along with a delegation of management decision rights to the consultants, we postulated that the existence of an informal control on both the cultural and social levels would have the advantage of disciplining the consultant, thus contributing to a better performance of the IT consulting firm. On its institutional page, LCR communicates on its culture as a differentiator from the competition. Internally, we observed the same. The onboarding process is mainly around LCR's history and culture. We particularly noted the communication by "mottos" to anchor the culture of the firm. For reasons of confidentiality, we will only reveal the meaning of the two "mottos" most often relayed by the consultants: trust by default and encouragement of individual initiatives. In the event of a breach of trust, deviant behavior or declining performance, the collective takes over from management to warn or informally/formally punish. In the light of this analysis, we can deduce that LCR trusts the intelligence and accountability of its consultants to work according to its interests, to be in a continuous quest for improvement and to display high performance behaviors. On the other hand, in case of deviation, the consultant community acts as a social controller. Indeed, the consultants are demanding towards each other, look at each other, push each other to improve in their projects and to conform to the values of the IT consulting firm thus leading to corroborating our fourth and fifth hypothesis. With regards to our sixth hypothesis, we postulated that the exercise of self-control, reinforced by a context where the information on the personal achievements is transparent and public, has the advantage of disciplining the consultant. Several respondents told us that almost all the information was available there (the operating margin of each tribe, the activity report of each consultant, his daily rate...etc.).

From our observations and use of Beta (the transparent management system used by all employees), we can confirm its openness and accessibility by all (including trainees). This leads us to conclude that it is consistent with social control by peers. Indeed, it allows to inhibit the counter-productive behaviors of the consultants, conscious of the look of their community, to self-discipline. It therefore participates, as a means of informal control, in exerting a positive action on the performance of LCR, thus corroborating our sixth hypothesis.

3.2.3 Financial incentives partly collective, and not only informal incentives

At LCR, annual bonuses are awarded based on the company's collective performance, in other words its overall operating margin. As mentioned earlier, the bonus calculation scheme can be done in two ways depending on the choice of the tribes. The first model is based on 50% of the tribe's operating margin and the remaining 50% of LCR's overall operating margin. The second model is based on 50% of the operating margin achieved by the tribe and 50% of the operating margin achieved by the league. Furthermore, we noticed that although the financial incentive at LCR is based on a collective performance objective, the amount of the annual bonus differs from one consultant to another depending on his level or advancement within the IT consulting firm. We also noted a second particularity of the calculation of financial incentives at LCR. These are dependent on a system of points according to the seniority of the consultant. This leads us to question the existence of an entirely collective bonus at the firm. We can therefore only partially corroborate our seventh hypothesis. As explained above, LCR does not individually assess the consultant's direct contribution to the tribe's operating margin. However, the consultant is evaluated individually on his overall achievements, i.e., by looking at his activity rate and his achievements outside the consulting projects. For that purpose, in addition to the report of activity of the Beta interface, the consultant proceeds to his self-evaluation, submits to the evaluation of his manager and that of his peers. The latter can give feedback face to face, via e-mail or during public presentations, which can enhance or tarnish the consultant's image. Based on the analysis of the various comments of our interviewees, the hypothesis of the reputation phenomenon as an informal incentive mechanism seems to be a powerful mechanism within LCR. Indeed, these consultants feel a need to gain visibility and legitimacy within the community through publishing books or articles in peer-reviewed journals for example. However, individual incentives are not only informal. In fact, the mechanisms of reputation and recognition by peers are a prerequisite for individual financial incentives such as a salary increase or promotion to a higher grade. We can,

therefore, only partially corroborate the superiority of informal incentive mechanisms within our IT consulting firm because they are a prerequisite of formal and monetary incentives over the long term.

3.2.4 LCR, a pool of up-to-date experts

In the cognitive part of our theoretical model, we postulated that the constitution of a quality knowledge pool positively impacts the performance of an IT consulting firm, through the association of an employer brand with selective recruitment. The analysis of our respondents' comments and the study of internal and external documentation show that it's not "Great Place To Work" certificates that influenced their choice of LCR. Several participants told us that it was meeting and interacting with LCR consultants that motivated them to join the firm. Whether it is a question of tracking or co-opting new consultants, LCR consultants remain the best ambassadors of the company. Through their projects or professional events, they are often in contact with future employees and can detect in them skills and behaviors in line with LCR's positioning and values. We observe that the participation of consultants in the selection of their future colleagues has two major objectives. Firstly, the consultants are in the best position to judge whether the candidate's skills and expertise meet the company standards. Secondly, they can detect if future LCR consultants will be in line with the corporate culture proving to be a powerful informal control mechanism. Given this evidence, we can partly corroborate our ninth hypothesis. A pool of quality knowledge through expert and culturally aligned consultants can then explain LCR's performance. With regards to the maintenance of a quality pool of knowledge, all elements listed on the theoretical level have been observed within LCR (training, communities of practice and a knowledge friendly culture). Moreover, the firm is the only company of its kind to have created an entity called the scientific department. More concretely, LCR's scientific policy is reflected in its willingness to take on doctoral students, fund Phd research and to involve research laboratories, with the aim of publishing the results of this research.

The major conclusion that can be drawn from our observations is the coherence of these formal and informal mechanisms for capitalizing on knowledge, which is a criterion for evaluating consultants' individual performances. In fact, apart from their performance on the project side, consultants are evaluated by their peers in terms of their contribution to the development of their community internally and their company externally. In view of LCR's organizational configuration and the initiatives created to promote a knowledge friendly environment, inside and outside the organization, our tenth hypothesis seems to be corroborated.

3.2.5 Agility, more than a methodology at LCR

Since 2005, LCR has been one of the forerunners in France of the agile methodology for IT projects. It contributes to reinforcing delegation and control functions of the disciplinary model and maintaining a quality pool of knowledge as part of the cognitive model. In fact, LCR consultants are autonomous in carrying out their tasks on sprint basis. Delivering functional versions of the product on short terms enable the frequency of project evaluation and feedback from clients and users. In addition, peer programming, peer reviews and collective reviews are some examples of agility practices used in evaluating consultants' performance. They allow tracking the progress of computer coding tasks and improving them as the same time. The latter is also possible through different rituals such as retrospectives, daily and weekly meetings. They support training programs and scientific department actions in maintaining the quality of LCR cognitive pool. We were surprised though to find other departments working with the agile methodology. Employees from both human resources and communication department reported being agile. This means delivering projects on sprints and embracing daily and weekly meetings and retrospectives practices to check on teams' temperatures, share news and/or knowledge. If we rely on the above results, we could conclude, at first glance, that our hypothesis is corroborated. Indeed, the consulting missions are well conducted according to the agile methodology and its principles act as amplifiers of the positive effects of the disciplinary model and the cognitive model. However, having observed its adoption by other departments and having experienced it as a trainee, we must qualify the formulation of our last hypothesis. It is not only performing IT projects using the agile methodology that moderate disciplinary and cognitive models impact on LCR performance but embracing it as a way of working at a larger scale that is more interesting. Agility can help producing better results when it is in a firm's DNA becoming part of its culture. Therefore, we can only partially corroborate our last hypothesis (H11).

4. Discussions and conclusion

The objective of our research is to propose an explanation of KIF performance (through the case of an IT consulting firm) based on organizational design theory and resource-based view contributions. From the analysis of our results, we can conclude that a complementarity between the disciplinary and cognitive models seems to

participate in the explanation of LCR's performance. Both models are reinforced by the role of agile methodology and the firm culture in positively impacting the IT consulting firm performance.

With regards to the limitations of our research and future recommendations, we can discuss the following. First, the qualitative method of the case study is often criticized, and especially when it comes to a single case study, for its ability to produce generalizable results. However, we consider that the generalization of the results is not the only way to understand the world. A single black swan disproves the theory of the white color of swans (Popper, 1968). It was never necessary to see several to decide. Although, the case method allows us to collect rich and informative data, we encourage future researchers to test our model on a larger sample of KIF. Second, we must underline a concern addressed several times by different profiles of respondents (consultants, partners, and CEO). It is cognitive overload defined as the load on working memory experienced while performing a specific task (Kalyuga, 2011). If the cognitive load exceeds the available working memory capacity, learning and performance may be inhibited. Some consultants felt it was a consequence of peer pressure. We explained that the phenomena of reputation and peer recognition represented a very important informal incentive mechanism within LCR. According to our respondents, it results in a continuous search for meaning, legitimacy and a long phase of self-doubt. Consultants spend the first two years establishing their legitimacy within their community and gaining recognition in a third phase. A second level of cognitive overload seems to be felt by the boards of directors. Some partners told us that it became more and more energy consuming to maintain their organizational culture as the firm scaled up. Despite its positive effect on the performance, such culture of trust, social control, and knowledge sharing seems to adapt painfully to the change of the firm's size. It results in consultants under constant pressure, and exhausted managers. The organizational equilibrium described above is achieved at the cost of a cognitive overload felt at all levels of LCR. This finding may lead to future longitudinal research on one or more KIF having scaled up. The concept of culture within a firm's organizational design may be studied considering similar size changes.

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