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HUMAN CAPITAL AND STRATEGIC HUMAN RESOURCE MANAGEMENT
IN KNOWLEDGE-INTENSIVE FIRMS : AN EXPLORATORY CASE STUDY

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Human capital and strategic human resource management in knowledge-intensive firms: an exploratory case study¹

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Abstract:

The aim of this paper is to answer two research questions: 1) what are the critical components of human capital within Knowledge-intensive firms (KIFs)? and through that, 2) which human resource management practices are implemented to mobilize these critical human capital components, considering that this mobilization can have a decisive impact on the company performance? These interrogations appear in the particular framework of the Strategic Human Resource Management literature, and are specifically here investigated in the context of KIFs. This emerging type of companies remains today not clearly defined, and is the object of many researches and discussions, particularly in terms of Human Resource Management and Knowledge Management. We try to answer to these questions through an exploratory multi-site case study analysis in 5 knowledge-intensive firms in Luxembourg, selected to form a convenience sample of 15 interviews in total. In this paper, we first introduce the research questions through a brief literature review, and secondly we explain the research methodology, present the analyzed companies and the data interpretation. We finally conclude with a transverse discussion and research perspectives.

Keywords:

Human capital; Knowledge-intensive firms; Human resource management practices; Intellectual capital

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Introduction

In the present contribution, our objective is to identify and understand which human resource management practices are used in the Knowledge-intensive firms (KIFs), particularly contributing to the performance of this singular type of companies. We note that the theoretical model of the KIFs still raises today some questions in the management literature in several ways, particularly concerning the strategy and the human capital management. Precisely, two interrogations appear in the particular framework of the Strategic Human Resource Management (SHRM): 1) *What are the critical components of human capital within the KIFs?* and through that, 2) *Which human resource management practices are implemented to mobilize these critical human capital components ?* The theoretical background presented below highlights that these two questions cannot be disconnected, and that it is recommended to first understand the specific properties of the human capital in a contingent manner, before considering the implementation of the practices to mobilize these specific components of human capital.

Up to now, on the basis of the existing literature, we are not able to answer these two questions, neither considering the HR practices and their alignment to the global strategy in general, nor considering the specific literature about the emergent organizational model of the KIFs. We think that the gap could be situated at two levels: 1) the accuracy of the definition of the critical components constituting the human capital to be mobilized through the HR practices, and 2) the definition of the practices, and their specificities in this precise context. It then seems to be sound to seek to conceptualize the human capital and to define the implemented HR practices to mobilize it using the empirical approach. We think that the choice to go back to the field could help us to develop a model that considers most of the contingency factors intervening in this context. This contribution presents the first phase of the empirical researches of our PhD. thesis, through an exploratory multi-site case study, specific to the selected inductive positioning of this first phase.

In this paper, we first introduce the problematic associated with the specific context of the KIFs. We then develop the theoretical basis of our questioning by briefly reviewing the definitions of human capital as proposed in the literature, not only in management, but also in economics and the knowledge management theoretical fields. We will also consider the different HR practices

and systems analysis perspectives, in the framework of the researches on the relationship between HR practices and the company performance in the SHRM theoretical field. This theoretical basis will enable us to legitimate the two research questions of this contribution. After having outlined the methodology of the following case study, we will present the companies selected for this contribution (structure, organizational culture, and strategy), each one treated in separate cases. On this basis, we will present and discuss the results of the data analysis with the objective to answer our two questions.

I. Problematic and theoretical background

Knowledge-intensive firm? Today still, the Knowledge-intensive firm concept remains relatively ambiguous in the literature (Robertson & Hammersley, 2000; Kärreman, 2010), and was introduced for the first time in 1992 by Starbuck. These researches take place in a deep mutation phase of our society from the industrial economy to the knowledge and information economy, at the dawn of the internet era (Powell & Snellman, 2004). At that time, more and more companies were already focusing on « knowledge-intensive » activities (Starbuck, 1992). In this framework, and on the basis of the Resource-Based View of the firm (Barney, 1991), Starbucks' researches are based on the question of the value creation and the development of a competitive advantage, with the objective to characterize the companies that no longer build their activity on the production of tangible goods, ignoring the standard pillars of the industrial organization and deliver knowledge.

In the wake of these works, numerous questions seek to precisely determine the difference between these organizations (KIFs) and the « traditional » companies (Alvesson, 1995 for ex.). Most of the contributions to the theoretical field appeared at the beginning of the last decade (2000). According to Alvesson (2000), a KIF is a company *where most of the work can be said to be of an intellectual nature and where well qualified employees form the major part of the workforce*. Several types of organizations - where mobilized knowledge is admitted as the input (Starbucks, 1992) – are today recognized by the literature as KIFs. For example, it is the case for the consulting companies, law firms, private banks, and also engineering or architecture companies (Robertson & O'Malley Hammersley, 2000), based on well defined professional

knowledge (lawyers, auditors), or based on implicit and fixed knowledge in the culture of the company (consulting companies or marketing agencies) (Backler, 1995).

Although the theoretical field remains still vague, at the meeting point of knowledge management, strategic management and HR management, Starbuck's contribution (1992) on the KIFs stays the reference. His work still generates today many discussions and continuations, particularly in the researches of Kärreman and his colleagues (2004; 2010 among others). Therefore, according to the authors and in relation with the question of this contribution, setting the competitive advantage on the production of intangibles has three consequences for the company (Starbuck, 1992; Kärreman, 2010): (1) the company can be characterized as « knowledge-intensive » as long as knowledge constitutes both the raw material (input) and the deliverable (output); (2) the company takes part to a specific learning process to produce the deliverable in order to mobilize and produce this knowledge; and (3) the company strategy's determination will be largely influenced by the importance of the knowledge in the production process. How is then HR management impacted by this learning process? And what are the consequences on the HR management, considering the global strategy of the company is affected and that the HR system must be aligned to this one (Wright, Dunfort & Snell, 2001)?

Questioning the intellectual capital: how to consider the human capital? Taking the above definition into account, in the framework of the development of a competitive advantage, machinery and physical capital are no longer the main investment, whereas the development of its intellectual capital is. Indeed, in this type of company, the recruited profiles are mainly *well-educated and qualified employees* (Alvesson, 1995; Starbuck, 1992). This intellectual capital concept is nowadays the object of many important researches and discussions (Marr, Schiuma, & Neely, 2009; Zambon, 2010 in the *6th International workshop on visualizing, measuring and managing intangibles and intellectual capital*, EIASM, Catania, October 2010), not only regarding the conceptualization, but also in terms of management and valorization of this specific capital of the company.

According to several authors, intellectual capital is today defined as a multi-dimensional concept, made of human capital, structural capital, and relational capital of the company (Bontis, 2000 ; Edvinson & Malone, 1997 ; Marr, Schiuma & Neely, 2004 ; Moon & Kym, 2006 ; Nahapiet &

Goshal, 1998). According to Andriessen (2004), this categorization of the concept could help us clarifying the definition and to improve the management quality of this capital in itself. In parallel to the classical definition, on which we will come back later (Schultz, 1961; Becker, 1964), we also find several definitions of the human capital in the Knowledge management theoretical field, such as the one proposed by Sveiby (1997), who defined it as *a capacity to act in a wide variety of situations to create both tangible and intangible assets*. The author emphasized the adaptable and flexible character of people to mobilize their capabilities to act. According to the same author, structural capital can be defined as *patents, concepts, models, and computers and administrative systems* that are developed in the company, while relational capital is based on the relationship between the company and its *customers and suppliers* (Sveiby, 1997, p.10), or more broadly, the environment built in its activity.

In this contribution, we specifically focus our attention on the « human capital » component of the company intellectual capital. Precisely, in the context of the researches concerning the specificities of the KIFs, it seems that the important implication of the human capital management to mobilize knowledge has been partially put aside, at the benefit of the researches in the new Knowledge-management theoretical field, including the study of the management systems and tools of this knowledge (Robertson & O'Malley Hammersley, 2000). Nevertheless, the assumption that the intellectual capital's strategic importance in KIFs also leads to intellectual - by essence, human - capital management specificities, seems logical. We think that these HR management practices could have an impact on the strategy development and implementation, having *in fine* an impact on the company performance.

However, according to the literature, the determination of real expectations in terms of performance to produce in KIFs remains difficult because of the characteristics of these companies. Among others, the flexibility of the management structures and the agility of the production processes have a sizeable impact on these expectations regarding the mobilized human capital human in this environment. We also noticed a gap in the formalization that makes it difficult, *a priori*, to precisely describe HR practices implemented to specifically generate these results. In the next section, we will present, as the basis of our development, the most common conceptualizations of human capital existing in the literature, and the different perspectives adopted by the authors to analyze the HR management systems.

Human capital as a source of knowledge. Literature reports several definitions of human capital, mainly in the economic science, SHRM, and, more recently, in Knowledge Management (KM). In reference to the classic and neo-classic visions of the production function, in parallel to the land, the labor, and the capital (assets of the company), the human capital concept was already mentioned by Adam Smith in the 18th Century, in terms of individual talents and competencies (Smith, A., Garnier, G., Blanqui, A. & Garnier, J., 1859). Long after, in the 1960s, the economists have recognized this capital as one of the main growth factors of our modern economy (Schultz, 1961 ; Becker, 1964), and gave the following definition: *Human capital covers knowledge, skills, competences and others qualities of a person, contributing to individual, social and economic welfare* (Keeley, 2007). We notice that, in the economic theoretical field, this proposed definition is still in use, but does not include a lot of details concerning the specific characteristics of human capital in companies.

Following our analysis, it seems that the introduction of the concept in the company-framework, in management, and particularly in the SHRM theoretical field, has never led to precisely specify it. The management literature's most frequent definition of human capital today (Liao, et al., 2009 ; Huselid, 1995 ; Delery et al., 1996 par ex.) was introduced by Jackson and Schuler (1995). It is partly based on the human capital theory (Becker, 1964 – the individual production capabilities), also used in management science by Flamholtz and Lacey (1981), who were the first ones to notice the significant contribution of the economic perspective of this theory to the HR management research. According to them, *skills, experience, and knowledge have economic value for the organization because they enable it to be productive and adaptable; thus, people constitute the organization's human capital. Like other assets, human capital has value in the market place, but unlike other assets, the potential value of human capital can fully realize only with the cooperation of the person* (Jackson & Schuler, 1995). *Therefore, all costs related to eliciting productive behaviors from employees – including those related to motivating, monitoring, and retaining them – constitute human capital investment made in anticipation of future returns* (Flamholtz & Lacey, 1981). In SHRM, and on the basis of the Resource Based View of the firm (Barney, 1991), human capital then constitutes one of the « key assets » for the company to create value, in function of its strategic choices (Becker & Gerhart, 1996; Wright & McMahan, 1992; Wright, Dunford & Snell, 2001). However, for about 10 years, a group of

authors emphasized the necessity to add – in parallel to the three components of the above definition (skills, knowledge, and experience) - components including employees' attitudes and behaviors, particularly in terms of motivation and commitment (Nishii, Lepak & Schneider, 2008 ; Liao et al., 2009 ; Katou & Budhwar, 2010 among others).

This opportunity to develop a competitive advantage through the mobilization of human capital is also stressed in the emerging researches in knowledge-management. As mentioned above, in this framework, human capital is viewed as a component of the intellectual capital of the company, regrouping an important portion of the available knowledge of the company (Moon & Kym, 2006 among others). It is particularly the case within the KIFs, where human capital constitutes the unique available source of knowledge to build the competitive advantage.

However, till today, we have not found any precise and thorough definition of the required characteristics of human capital in KIFs. According to the literature, most of the « knowledge-workers », highly qualified, have cumulated an important experience inside the company or in the same business area and, as a consequence, constitute a rare and extremely-valuable resource on the labor market. Indeed, according to Kelley (1990), these workers are classified as « gold collar workers », highly *demanding and receiving good terms and working conditions*, particularly regarding flexibility. Furthermore, the nature of the work they perform often requires and authorizes a high degree of autonomy (Robertson et al., 2000). This work is particularly intellectual, specialized, and based on the clients' needs. According to Keegan (1998), these two important characteristics of human capital in the KIFs (rarity and autonomy) *pose particular challenges when managing knowledge workers and often quite distinctive approaches are adopted to people management that differ considerably from traditional models of HRM* (Keegan, 1998 ; Robertson et al., 2000). We are now going to describe more accurately these human capital characteristics and the related practices implemented to mobilize this human capital.

HR practices to mobilize the human capital: a contingent perspective. From the above definitions (Flambholtz et al., 1981; Schuler et al., 1995; Becker, 1964), we understand that the HR practices constitute a decisive investment in this type of capital to achieve the strategic objectives of the company. In this framework, numerous studies have been conducted in SHRM

since the middle of the 1990s, investigating the extent of the implemented HR practices impact on the company performance (Huselid, 1995; Delery et al., 1996, among others).

Thereby, several studies have developed HR practices systems, named *High Performance Work Practices* (Huselid, 1995; Arthur, 1994). These systems or lists of HR practices constitute the starting point (index) to analyze their impact on the company results, such as the organizational or financial performance, most of the time considering these HR practices in systems capable of synergies. Several studies validated the hypothesis, that the practices, regrouped in a coherent system, lead to higher company performance, than single and independent practices (Wright et al., 2001 for ex.). However, comparing the results of these works remains a tough exercise as the systems differ in the practices they contain and in the way practices performance are measured.

For example, in his 1995 study, Huselid - pioneer in the analysis of the relationship between HR practices and performance - has built an index including thirteen HR practices, split in two groups. A first group is composed of the practices covering the employees competencies and the organizational structure : information sharing programs, formal job analysis, internal promotions, attitude surveys administration, participation of the workforce in Quality Work Life programs or Quality Circles, labor-management participation teams, incentive plans or profit-sharing plans, training, formal grievance procedure or complaint resolution system, hiring employment test (selection process). The second group includes the practices concerning employee motivation: formal performance appraisal, compensation in function of this performance, promotion criteria (merit, seniority, performance).

In addition, following Pfeffer's model (1998), still mentioned by Luna-Arocas (2007), seven HR practices prevail: job security, selective hiring and new personnel, autonomous teams and decentralization of decision making as the core element of the organizational design, a comparatively high salary driven by results, extensive training, a lessening of distinctions as well as substantial participation from the different company departments in financial information and results.

On this basis, three analysis perspectives of the practices impact on the company performance are proposed in the literature (Delery et al., 1996; Carrière & Barrette, 2005 among others): (1) the universalistic perspective, the most simple one, but also the most adopted in the studies,

considering that some practices have systematically more impact on the company performance than others, regardless of the selected strategy of the company ; (2) the contingent perspective, according to which the HR systems must be adapted to the global strategy, and consequently to the specific environment of the company (vertical alignment) ; and (3) the configurational perspective, considering the fact that the HR practices systems must be adapted to the global strategy, and also asking for a coherence between the HR practices themselves (horizontal alignment, or internal coherence).

From this point of view and in line with the results of the empirical studies, it seems that taking both vertical and horizontal alignments - configurational perspective - into account leads to the most significant results, compared to the two other perspectives (Delery et al., 1996; Carrière & Barrette, 2005; Boselie, Dietz & Boon, 2005). However, we noticed that only a few little number of studies using the contingent and the configurational perspectives have been developed in the framework of quantitative multi-site studies. The studies adopting these perspectives analyze the impact of the HR practices within several business-units of a same company, with the objective of controlling these contingency variables. To stay coherent in this contribution, all these contingency factors (strategic positioning, HR management structure) will therefore be considered in the analysis of the implemented HR practices for each company, the objective being to determine the impacts of these choices on the human capital management, precisely in terms of HR practices, and in function of the company specific performance criteria.

Taking these theoretical foundations into account, we can now formulate the two research questions of this study. First of all, knowing the human capital conceptualization in general, and the critical components of this capital in particular remain relatively unclear in the existing literature, particularly regarding the KIFs, this lack of conceptualization leads us to try to define the critical components of the human capital in these KIFs, adopting the contingent analysis perspective. Secondly, because the configurational analysis perspective of the relationship between HR practices and company performance is the best way to apprehend the HR system impact on the global strategy of the company, we will try to determine which HR practices are implemented to mobilize the human capital in these KIFs.

II. Research method

Multi-site case study methodology. In line with the highly exploratory positioning of this research, we decided to use the multi-site case study method to build a new conceptualization of human capital adapted to the KIFs context, or at least to try to complete the existing definitions (see above). To reach this objective, we adopted a contingent analysis perspective.

Data collection. This case study is cross-sectional, data have been collected in September and October 2010. At the beginning, we have contacted fifteen companies. Five of them accepted to participate, and complied with the exact requests of our research design. All these companies are located in Luxembourg, and employ at least 100 persons. They have been selected to form a convenience sample, including the main company types, recognized as KIFs by the literature (Starbuck, 1992 among others): one consulting company, one law firm, one building engineering office, one research center, and one private bank.

Interviews of about 60 minutes each have been performed to collect data, with 3 members of the management board: generally the CEO (Chief Executive Officer), the CFO (Chief Financial Officer), and the HR manager or delegate, in function of the structure of the company. First deviation from this methodology, we only had the opportunity to realize two interviews in the engineering office. Nevertheless, the quality of the data of these two interviews was highly valuable to take this case into account in our study. Second deviation is a 4th interview that we had the opportunity to conduct with the consulting company. All of them have been integrated into the case. In total, our multi-site case study includes (N=15) interviews. They all have been transcribed, in order to facilitate the analysis of their content.

Interview guide and data coding system. In line with the exploratory essence of this study, we have based the interviews on an interview guide, asking open questions, minimizing any source of influence for the interviewees. As a first step, each interviewee had to introduce himself, his company (organizational structure, culture, and strategy) and his function. We also validated that the company complied with the definition and could be classified as a KIF. Concerning the human capital concept, we used the following questions: *Do you use « human capital » terminology in your company?* If no, *Which competencies are required from your employees?* In every instance, *Which employees characteristics contribute to your company competitive*

advantage? If needed, we formulated these questions using existing definitions of human capital, including the competencies, capabilities, attitudes, behaviors, general employee qualities, all having a strategic influence on the company.

In addition, the HR practices concepts that are mentioned in the framework of the mobilization of the human capital were introduced as following: *Which HR management practices do you use to manage the human capital that has just been defined? According to you, which practices contribute the most to the company performance?* When necessary, to stimulate the answer reflexion of the interviewees, we presented HR practices (Pichault & Nizet, 2000; Huselid, 1995), such as: *recruitment or selection practices, integration, training and development, evaluation process, promotion, rewards, communication, group management, decision making processes, professional relations, hierarchical structure.*

On the basis of the interviews transcription, and in the framework of our content analysis data treatment process (Bardin, 1977; Miles & Huberman, 2003), we interpreted the data on the basis of the recurrence of the human capital components and HR practices. Data treatment has been performed using an Excel spreadsheet, grouping all the critical human capital components. HR practices were separately sorted, using existing HR practices index (Huselid, 1995 among others), with the objective of determining which ones are frequently implemented within in the KIFs.

III. Cases presentation

Organizational structure, culture and strategy

1) **Law firm:** The law firm *LA (LawyersAssociates)* provides legal advices. The office was created in 1988, as a result of the merger of two law firms, in order to offer a variety of high quality services, particularly in the financial, corporate, and tax fields, at the local and international levels. It is certainly this strategic vision that constitutes the company's strength, as the leader law firm in Luxembourg. The company grew significantly over the last three years,

totalizing 400 employees today in one of the three buildings of the company, of which 270 are lawyers and attorneys at the Luxembourg bar. *LA* is made of fifteen departments, and each being managed by one of the associate owners of the company, and includes several hierarchical functions (junior, senior, manager). Company culture's core values are based on excellence, expertise, customer service orientation, and professionalism.

2) **Consulting company:** The consulting company *LuxConsulting* was founded in Luxembourg in the beginning of the 1990s, and proposes three main categories of services - audit, tax advisory, management advisory - to domestic and international customers. The company employs 1200 persons (juniors, seniors and managers) grouped in several teams structuring these three departments. These teams are led by the owner associates of the company, applying a small company entrepreneur managing style. The brand name of the firm is sold as a franchise, but the owners keep the entire decision power, at least regarding strategy and finance. The important values in the company are those of excellence, ambition, customer service, entrepreneurial spirit, and the reputation of the group and its brand. *LuxConsulting* is ranked number two among the *big four* consulting companies located in Luxembourg, focusing on a customer service strategy.

3) **Research Center: CRM (*Centre de Recherche Médicale*)** has been created on the basis of the 1987 law aiming to develop scientific research in Luxembourg. Over the past five years, the company has experienced a intense growth, and now employs 250 people, of which 24% works in research support services (HR management, finance, IT,...). Most of the employees have a PhD. or have a medical degree, and contribute to the research projects that are conducted in the center laboratories. Fund raising is a preliminary and vital step to start any new project. Small business management style is used by lab leaders who also practice as doctor in one of the state hospitals, bringing thereof important practical experience to the researchers. The most important organizational value is entrepreneurship to develop innovative research projects, with the global vision of promoting the center leadership in several research domains. This is achieved through researchers' cutting-edge and highly valuable scientific publications, with the final objective of contributing to the progress of Science.

4) **Ingeneering Company: IGT&Co. (*Ingénierie en Génie Technique*)** is specialized in building engineering, and is the most important office in Luxembourg, considering its workforce and the delivered service quality. Although based on a family company created in 1948, this company resulted from the association of two expert entrepreneurs in technical engineering in 1993. For about ten years, it has continually grown, employing 120 persons today, most of them being engineers. The strategic objective of the company is to reduce the size of the support functions (HR, accounting...), and to give more entrepreneurial and managerial responsibilities to the engineers, on the basis of a total quality management system organizing the daily activity. The company is fully supervised by two associate directors, inspiring a strong family and conviviality culture, based core values of trust, respect and team spirit.

5) **Private Bank: TPB (*TopPrivateBankers*)** is active in Luxembourg since 1987, and is an affiliate of an international group that provides financial services, specialized in banking, investment, health-insurance and pension. Following a grow by acquisition strategic vision, the workforce of the company is today composed of 800 employees in Luxembourg. Regarding the organizational structure, the company is divided into several departments, delivering highly personalized and adaptable services (private banking) on one hand, and « back office » services on the other hand. The high quality of the service and the professionalism of the employees are the main values of the company. The managers emphasize and transfer the sense of responsibility to the employees in a very structured and formalized managerial system.

Control variables, internal contingency variables, and use of the « human capital » terminology. To begin, and to base our contingent analysis, we present several control variables concerning the organizational structure, the HR function positioning in this structure, and the use of the *human capital* terminology (see Table 1).

****Insert Table 1 about here****

First, in the framework of the determination of the companies as KIFs, we notice that there are two extreme cases in our data sample, in terms of mobilization (input) and production of knowledge (output). Indeed, on one hand, the research center mobilizes and produces « pure »

knowledge, without considering any service delivery objective. On the other hand, we believe that the private bank cannot totally be categorized within the KIF, because the majority of its activities consist in compiling internal existing processes to deliver adapted solutions to the client. Nevertheless, according to the existing definitions (see above), we think that this process mobilization can also be considered as knowledge based, and partly requires highly qualified people. Additionally, companies composing this case study employ between 113 and 1200 people, and the two largest structures are the consulting company and the private bank ones.

The hierarchy of the companies is relatively strong. There are at least four levels in three companies (over five), and on average six in the private bank. On the contrary, in the research center and the engineering office, the hierarchy is flat, with only two levels: the directors or the heads of laboratory (with the director of the center), and the engineers and researchers. Only the consulting company and the law firm systematically specify the employee categories in the interviews (for example junior, senior, manager, associate). On this basis, we notice that these two companies demonstrate similarities regarding the variables of the table.

In the framework of the human resource management, all the companies have a formalized HR department, apart from the engineering office, which remains a limited structure based on a familial and informal organizational model. Indeed, at *IGT&Co.*, the directors and the administrative officer (finance and personal administration) manage the human resource daily, without any formalized HR department. In the other companies, HR department seems to be positioned as a support function only, supporting daily management of the human capital by the associates (consulting and law firms) or heads of laboratory (research center). On this point of view, the private bank is very different: the HR manager (HR Officer) benefits from a real day to day managing partner statute, participating to the decision making. However, we notice that all the human resource managers / officer are members of the management board of their company.

It is interesting to note that the *human capital* terminology is not used by the companies strictly complying with the “KIFs” definition (see Table 1). While the bank is the only one to use the terminology, the other companies use alternative generic names such as *collaborator*, *researcher*, or *employee*, or use the specific grade (consulting and law). The *human capital*

terminology is most of the time negatively received by the managers, who generally prefer not to attach any financial overtone to the *human component* of their company.

Through this analysis, trends emerge from our sample. As the consulting company and the law firm present numerous similarities, the research center also presents some shared elements with them, although it does not deliver any services. If the engineering office is partly similar to the research center, a lot of singularities remain (particularly non-formalization) due to its little structure and family culture. The private bank differs one more time from the four other companies, with a decisive HR department role in the daily management of the company, and the important hierarchy and formalization of the management processes and practices in general.

VI. Data interpretation

Critical components of human capital within the KIFs. In this section, we take the particular context of the companies into account, and we try to answer to the first question, and to define the critical components of human capital. In this framework, we select these components in function of the recurrence of the concepts used by the interviewees to define human capital. A component is mentioned in the tables (see Tables 2 and 3) when it appears at least in two interviews from the same company. We have made a list composed of these ones. On this basis, we consider a component as critical in the KIFs if it is recognized as emerging in at least three companies. After that, the list was split in two categories: on one hand, the individual components (hard skills, soft skills, knowledge management) (see Table 2), and on the other hand, the components concerning the management capabilities and organizational culture (spirit / organizational culture, management) (see Table 3).

****Insert Table 2 about here****

The first table (see Table 2) concerns the *hard skills, soft skills and knowledge management components*. On this table, we notice that ten components take place in at least three cases over five (ie. 63% of common critical components). Precisely, the *technical knowledge relative to the function*, the *teamworking capability* and the *ability to life-long learning* are critical in all the

cases. In addition, the *experience within the task*, the *communication capability* (internal and external), the *capability to have a good contact with the customers* and the *ability to explain and translate the proposed solutions* to them seem to be necessary in the four companies delivering services (*LA, LC, IGT&Co. and TPB*). To a less important extent, the *ability to reassure the customers* is critical in three service companies. We also notice that the *integration capability in the company* only emerges in two companies. Moreover, surprisingly, « deeper » relational components, such as *the ability to be friendly with customers*, and to *build a long term partnership* with them do not seem to be very important in the analyzed cases. In the same way, the necessity of *specialization to a particular task* is critical in the research center and the consulting company only, and *the linguistic competences* are critical in the law firm. We notice that the *networking ability (external)* comes up in the research center only. Nevertheless, it is interesting to underline the general necessity to be able to interact internally and externally (customers or research network), on the basis of a high ability of life-long learning, in line with Starbuck's works (1992). Eventually, while Knowledge-management seems to be a fashion discussion subject in today's companies, we notice that the ability to share knowledge only emerges in two companies: the law firm and the consulting company. In particular, the consulting company is today developing a specific knowledge management system.

****Insert Table 3 about here****

The second table (see Table 3) presents the components concerning the management and the organizational culture. We want to highlight the fact that the classification of these components was made in an inductive way. Thus, we immediately notice the importance of the critical components concerning employees' culture, related to the organizational culture (52% of the critical components). Twenty-three components are related to the spirit / culture, among which ten are recognized as critical in the KIFs. Indeed, the necessity of *entrepreneurial mindset* seems to be critical in all the cases. The *customer service culture* is logically critical in the service companies, while *flexibility in the task* is critical everywhere, except for the engineering office. To a less important extent, *open-mindset*, *exemplarity* and *motivation* (in line with Katou et al., 2010 among others) also come up.

We also notice the fact that the need of *exemplarity nature* takes systematically part in the companies where the associates / directors have a key function in the human capital management. The necessity to « *fit* » to the *organizational culture*, understood as the subjective *a priori* perception of the correspondence between the personality of the employee and the organizational culture is seen as critical in three companies. *Reactivity* and *quality care* in the task are both critical in the consulting company and law firm. *Quality care* is also, and logically, critical in the engineering office, considering the fact that the organizational processes are based on a Total Quality Management system (ISO 9001). In addition, *reactivity* is critical in the bank. Finally, *internal feedback culture* is required in three cases, in the same way than *reactivity* (in the consulting company, law firm and private bank).

Three over five components related to the management capabilities are critical within the KIFs: *team management ability* and *leadership* emerging in all the cases, apart from the consulting company. The *ability to detect and train the successors* is critical in the same way. This ability is critical in the consulting company, the law firm, and in the private bank, as *reactivity* and *quality care* components. We notice that these three companies are the most important structures of the case study. All in one, according to our analysis, twenty-three components among forty-four are defined as critical within the KIFs context. On this basis, we think that we can conclude that singular human capital characteristics are commonly required in this particular type of company.

Human resource management practices within the KIFs. We present the implemented human resource practices (HR practices) in two separated tables (see Tables 4 and 5) for more readability. HR practices of the first table are related to: the communication and the description of function (see Table 4), in the second table: the employee competences, their evolution in the organizational structure, and time management (see Table 5).

Insert Table 4 about here

We note that employees generally communicate only with colleagues of their team, and the communication between the teams seems relatively difficult and not very formalized (apart from the bank organization). In most of the companies, departments seem to work in « silos ». In

addition, the companies communicate on their strategic results and objectives approximately once a year. In the consulting company, an Intranet system is the basic mean of communication, which is then more formalized and easy to stock and analyze.

All the companies describe the employees' functions (job analysis), apart from the law firm (formalized system in progress). The bank is the only one to have a structured and formal function classification and description system. The consulting company, the research center and the engineering office have built a job analysis system which is highly flexible and adaptable to projects and opportunities. In fact, these function descriptions constitute a standard base, and need numbers of additional *ad hoc* information to be completed. From these practices, we point out that the bank is clearly different from the other companies as the implemented practices are much more formalized. The important communication requirements and human resources management needs (recruitment) can explain this difference, as they require very clear and specific functions and profile descriptions.

****Insert Table 5 about here****

Table 5 presents the practices related to the employees' skills, positioning and evolution in the organizational structure. In this framework, we first highlight that the engineering office is the only one to recruit in function of arising opportunities, considering that directors prefer to focus on the quality of the services than to the workforce growth. The other companies base their recruitment policies on their future needs or projects, and, specifically in the bank, on job vacancies. Moreover, except for the consulting company, all companies mainly recruit experienced people, which could be explained by the long-lasting consequences of the financial crisis in Luxembourg. The consulting company remains the largest recruiter of juniors (just finishing university, or with one or two years experience). Company recruitment principally uses two channels: the internal and external networking, and the universities, educating highly specific profiles and proposing trainees. We believe that these channels offer opportunities to better apprehend candidates' competencies and qualities, before starting the selection process. This selection process is at first based on the technical knowledge and expertise of the employees, but is also based on the a priori perception of the « fit » to the organizational culture in three out of five companies. We note that soft skills are rarely tested during the selection

process. If the selection of the potentially interesting curriculum vitae remains the HR officer's role, we want to highlight that, apart from the bank, it is the team manager (associate, head of laboratory, director) who proceeds to the interview and takes the final hiring decision. Such a practice demonstrates that the HR function is positioned in these four companies as a support function, rather than a real partner of the team managers.

Another consequence of the economic crisis in Luxembourg is the willingness to hire immediately productive employees, meaning that they are almost directly integrated in their team. This is the case in all the studied companies, except for the consulting company, which offers a one-month training to new hired employee, after which they are gradually integrated in their teams. We also note that the companies often implement mentoring practices, but frequently in a non formalized way.

Throughout the employee's activity in the company, the managers highly consider the practices related to the training and development. The training selection is always made at the light of arising opportunities, in function of the company needs, and in line with the personal evolution and career orientation willingness of the employees. In the law firm and in the consulting company, the managers strongly put the emphasis on the need of « on-the-job » training under the supervisory control of a mentor, generally the direct manager. A particularity appears in the engineering office, where experience in the function becomes more important than the diploma after several years in the company. For example, a technician can be appointed for task usually assigned to an engineer, thanks to his cumulated experience on the job. In most of the cases, employees have the initiative regarding their career development and orientation choices. However, in the law firm, the consulting company and the bank, this choice is also dependent on the manager's opinion. All the training proposals generally refer to hard skills (technical knowledge, legal and financial regulations for example). In this framework, it is interesting to note that the consulting company and the law firm perceive the training offer as a reward from the company to the employee. Within the engineering company, training is also perceived as a reward, but is primarily related to a necessary contribution to the company global knowledge evolution to face the market. The individualist culture of the research center leads to consider training as a personal responsibility, contributing especially to individual career development and external employability (in universities and international research centers). Finally, training in the

bank company is recognized as a necessity to align to competition, but is pre-eminently a source of evolution in the functions classification and in the hierarchy.

Once again, career development practices differentiate the bank from the others companies. It is indeed the only one to propose a formalized career plan during the hiring interview. It is also the only one to have built a formalized talent detection and development system. In most of the cases, similar to the training practices, the employees choose to a certain extent freely their development orientations.

The research center is the only company that does not regularly implement performance appraisals. The other companies evaluate the employees' performance once a year, while the bank does it twice a year. Once more, the evaluation criteria are relatively highly adaptable in function of the unique evaluator. In the bank, the evaluation is processed through a 360 degrees performance appraisal system. In all cases, except for the research center, the evaluation is validated (objectification) by other evaluators for more equity within the whole company, particularly in terms of bonus and promotion. When the evaluation is formalized, it always has an impact on the employees' promotion opportunities. Promotions are important in all the companies, but in the research center and in the engineering office consist in a responsabilisation rather than an evolution within the hierarchy. This is the opposite in the consulting company and the law firm.

In the bank, job promotions are based on the evaluation criteria integrated in the functions classification. The salary is split into a fix part based on the function, and into a variable part linked to organizational and / or individual performance (engineering office). The research center is an exception: the salary is set according to the state salary index, only based on the function and the seniority. The consulting company and the law firm show similarities which differ from the others due to a high variability of their pay system (*intuitu personae*), under the responsibility of the associate, but still based on a formalized pay index in function of the grades.

When it comes to the HR practices related to time management, all companies use timesheet to monitor employees' time utilization. In this way, the highly non-formalized characteristic of some HR management systems is largely compensated by the important objectification of the activities resulting through the use of this tool (including training,...), and automatically

connected to the cost control system. Although there is no time clock in these companies, managers underline the importance of working time flexibility, which is strongly regulated through timesheets. This flexibility seems however more perceived as a mean to increase the working time, than a real possibility to adapt this working time in function of the needs. Moreover, overtime payment is unique to the engineering office. The bank once again differentiates by offering frequent part time possibilities. If employees can generally work from home (telework), this practice is most of the time perceived as a last option solution.

Transverse discussion and conclusion

In this study, we highlighted the human capital critical components, and their mobilization within the KIFs. Through this analysis, we detected the common characteristics of the emerging HR systems. We immediately noticed that the private bank significantly differs from the other companies, particularly regarding its compliance with the KIF definition, its HR function positioning, its critical human capital components, and the HR practices implemented to mobilize human capital. This is the reason why we decided to focus on the other four companies in the following discussion.

In this framework, we notice that some practices are fundamental in all cases, particularly those concerning life-long training and learning, development and evolution, which are implemented with the objective to maintain internal and external employability. The importance of these practices clearly demonstrates the willingness of the companies to develop human capital within the organization (Lepak & Snell, 1999). However, these important development practices do not result in career development plans or formalized talent detection systems. Surprisingly, no specificities emerge in terms of performance appraisal practices, related to the promotion and reward practices. We could explain the relatively « basic » use of these performance management practices through the importance of the offered development opportunities, especially leading to the motivation human capital critical component (Huselid, 1995). Nevertheless, we observe a kind of implicit « evolution race », or at least a « responsabilization race », that could be a result of junior employees recruitment, and of the high importance of life-long learning and development. This race could raise questions in terms of « up or out » politics,

that are quite debatable in Luxembourg today, particularly in the consulting companies and the law firms.

In terms of human capital critical components, we notice that spirit and organizational culture are very important, maybe as important as the technical knowledge and experience on the job. We particularly notice the necessity to “fit” with the organizational culture and to show entrepreneurial mindset, that are in line with the less formalized and *intuitu personae* emerging HR management practices in these companies.

This contribution also presents information on the specific role of the HR function in these companies, in formalized departments or not. In this framework, we notice that the HR function within KIFs is a support function to the daily human capital management. In most of the cases, and related to the important entrepreneurial critical component of human capital expected from the team managers or head of laboratories, the HR function proposes several management tools (HR practices). The associates or directors can adapt these tools to manage their team or department, as their own company.

We believe that the low formalization of some practices could result from the reactivity and flexibility critical components of human capital, and to the open-mindset. We also think that, in the research center, the law firm and the consulting company, this low formalization of the HR practices contributes to company’s reactivity on the market (working time flexibility for example). As a consequence, this HR practices system reactivity is adapted to the global strategy of both the consulting company and the law firm, where the strategy is customer focused.

In conclusion, this highly exploratory study lets us learn more about the human capital critical components within KIFs and highlights some particularities in terms of parallelism between HR practices within the selected companies. We however want to underline that this contribution is a first exploratory treatment and interpretation of our data base. Indeed, we did not use any scientific data analysis software, such as ENVIVO. And due to the large amount of information to present in this framed contribution, we did not introduce any Verbatim to illustrate the interpretation and discussion. For more readability, we largely summarized the results of the data analysis, and took by this way the risk to omit some valuable information. While we conclude that each of our two research questions could generate a contribution in itself, we could have also

more emphasized the alignment necessity of the human capital critical components and of the HR practices to mobilize it, with the objective to generate higher performance inside the organization.

Eventually, we hope bring additional information to complete the existing human capital conceptualizations and HR practices systems developed in the SHRM literature in general, and particularly in the framework of the researches on KIFs. We also hope that this paper will contribute to a more accurate knowledge about the emerging organizational model of the KIFs, and the specific HR system implemented in these companies.

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Table 1 - Cases presentation

	Law firm	Consulting company	Research center	Ingeneering office	Private bank
	Lawyers Associates	LuxConsulting	MedicalResearch Center	IGT&Co.	TopPrivateBankers
	LA	LC	MedRC	IGT&Co.	TPB
Control variables					
KIF characteristics	+	+	+	+	+/-
Size	400	1200	250	113	800
Organizational structure					
Hierarchy	+/-	+/-	-	-	+
Number of steps in the hierarchy	4	5	2	2	6
Employee categories systematic specification	Yes	Yes	No	No	No
Main employee categories	Junior-Senior-Manager-Associate	Junior-Senior-Manager-Associate	/	/	/
Contingency Variables					
Existing HR department	Yes	Yes	Yes	No	Yes
Key function taking HR final decisions	Associates	Associates	Head of laboratory	Director	Manager + HR Officer
HR department positioning	Support	Support	Support	/	Partner
HR Manager is a member of the management board	Yes	Yes	Yes	/	Yes
HR system development	Support of the daily management by the associates	Support of the daily management by the associates	Support of the daily management by the heads of laboratory	To fit to the Insurance Quality Systme (ISO9001)	To align HR stragegy to the global strategy
Human capital concept					
Use of the terminology	No	No	No	No	Yes
Other used terminology	Collaborator - Junior-Senior-Manager-Associate	Collaborator-Junior-Senior-Manager-Associate	Researcher	Collaborator	Collaborator - employee

Table 2 – Human capital critical components: Individual components

<i>I. Individual components</i>	Law firm	Research Center	Consulting company	Ingeneering office	Private bank	Total
	LA	MedRC	LC	IGT&Co.	TPB	
Hard skills (5)						
Technical knowledge relative to the function	x	x	x	x	x	5
Specialization to a particular task	x	x				2
Experience within the task	x	x		x	x	4
Linguistic competences	x					1
Ability to life-long learning	x	x	x	x	x	5
Analytical capacity - structuration of the problematics			x	x	x	3
Soft skills (10)						
Communication ability (internal – external)	x		x	x	x	4
Capability to have a good contact with the customers	x		x	x	x	4
Ability to explain the proposed solutions to the customers	x		x	x	x	4
Ability to translate proposed solutions to the customers			x	x	x	3
Ability to reassure the customers	x		x		x	3
Ability to be friendly with the customer			x			1
Construction of a long term partnership with the customers	x			x		2
Teamworking capability	x	x	x	x	x	5
Integration capability in the company		x		x		2
Networking ability (internal - external)		x				1
Knowledge management (1)						
Ability to share knowledge (internal)	x		x			1

***Critical human capital components are in bold**

Table 3 – Human capital critical components: Organizational culture and management abilities

<i>II. Organizational culture and management abilities</i>	Law firm	Research center	Consulting company	Ingeneering office	Private bank	Total
	LA	MedRC	LC	IGT&Co.	TPB	
Spirit / Organizational culture (23)						
Entrepreneurial mindset	x	x	x	x	x	5
Curiosity			x			1
Learning willingness	x	x				2
Open-mindedness	x	x	x			3
Multiculturality	x				x	2
Exemplarity nature towards senior collaborators	x		x	x		3
Motivation within the task	x	x	x			3
Commitment					x	1
Ethics - integrity at work			x			1
Autonomy within the task			x			1
"Fit" to the organizational culture			x	x	x	3
Service culture	x		x	x	x	4
Mutual-aid spirit (internal - external)			x			1
Quality care in the task	x		x	x		3
Responsiveness to the changes of the market and the general environment	x		x		x	3
Flexibility in the task	x	x	x		x	4
Resistance to stress				x		1
Fighting spirit					x	1
Speed within the task			x	x		2
Understanding of the strategy					x	1
Feedback culture (internal)	x		x		x	3
Management abilities (5)						
Team management ability	x	x	x		x	4
Leadership	x	x	x		x	4
Project management ability		x				1
Ability to take a decision - Ability to take a responsibility	x			x		2
Ability to detect and train successors	x		x		x	3

***Critical human capital components are in bold**

Table 4 - HR practices (1)

	Law firm	Research center	Consulting company	Ingeneering office	Private bank
	LA	MedRC	LC	IGT&Co.	TPB
Communication	In team meetings	Intra-laboratory	In team meetings	Day to day	In team meetings
Communication of the strategy	Annually	Annually	Annually	Annually	Annually
Formalization of the communication	+/- Formalized	-- Formalized	+ Formalized (Intranet)	-- Formalized	+ Formalized
Function description	No	Highly flexible description of the functions according to the existing projects	Highly adaptable generic competency model	Description of the functions based on the existing projects	Precise function classification and description

Table 5 - HR practices (2)

	Law firm	Research center	Consulting company	Ingeneering office	Private bank
	LA	MedRC	LC	IGT&Co.	TPB
Recruitment / selection	In function of the needs	In function of the projects	In function of the future needs	In function of the opportunities	In function of the free functions
Principal employee profiles	Mostly experimented	Experimented scientifics (PhD.) and PhD. Students	Mostly juniors	Mostly experimented	Mostly experimented
Selection criteria	Technical knowledge Expertise	Scientific background	Technical knowledge Soft skills Fit to the organizational culture	Technical knowledge Fit to the organizational culture	Fit to the organizational culture Training
Recruitment channel	Spontaneous applications Head hunting Trainees	Activity sector networking Universities	Universities Activity sector networking	Activity sector networking Spontaneous applications	Internet website Internal calls Spontaneous applications
Principal interviewers	Associate or senior manager	Head of laboratory + HR manager	Associate or senior manager + HR manager	Director	HR Manager + Team manager
Integration	Direct	Direct	Indirect	Direct	Direct
Formalized mentoring	/	Head of laboratory	/	/	Team manager
Mandatory basic training	2 days	/	1 month	/	/
Training	Initial background is highly important Ad hoc training On the job training (mentor)	Ad hoc training Training in function of the projects needs	Highly valued Ad hoc training On the job training (mentor)	According to the development choice of the employees Less important than "on the job" experience	Highly valued According to the development choice of the employees
Initiative	Employee + Employer	Employee	Employee + Employer	Employee	Employee + Employer
Skills	Hard skills	Hard skills	Hard skills + soft skills	Hard skills	Hard skills + soft skills
Perception of the training offer	Retribution	Personal responsibility	Retribution	Retribution Necessity	Necessity Source of promotion
Development					
Formalized career plan	No	No	No	No	Yes
Formalized talent detection plan	No	No	No	No	Yes
Development choice	Medium	High	Medium	High	High
Evaluation	Management by objectives	Management by objectives	Management by objectives	Management by objectives	Management by objectives
Formalized performance appraisal	No	No	Yes	Yes	Yes
Frequency	Annual	After 6 months	Annual	Annual	Twice-yearly
Adaptability	Very high	Very high	High	Quite high	Low
Evaluator	Associate	Head of laboratory	N+1	Director	360°
Objectification process	Yes	No	Yes	Yes	No

Promotion	Yes, systematically	No	Yes, based on the evaluation	No, but responsabilization	Yes
Link with the evaluation process	No	/	Yes	Yes	Yes
Evolution possibilities	Yes	High, but not in the hierarchy	Yes	High, but not in the hierarchy	High, based on the evaluation and on the functions classification
Reward					
Link with the evaluation process	No	No	Yes	Yes	Yes, based on the function classification
Link with the function	Yes	Yes + seniority bonus	Yes	No	Yes
Composition of the reward	Fix + variable	Fix	Fix + variable	Fix + variable	Fix + variable
Bonus	Yes, based on the organizational performance	No	Yes, based on the service line performance	Yes, based on the organizational and individual performance	Yes, based on the organizational performance
Specificities	/	/	/	Overtime pay	Possibility to buy days off
Adaptability	High, in function of the associate	Very low	High, in function of the associate	Middle	Low