

Human Resource Management and Innovation: What are Knowledge-Intensive Firms Doing?

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Abstract

An undeniable shift in focus from traditional production companies to Knowledge-Intensive Firms (KIFs) poses challenges for academics and practitioners alike. In particular, effective management of an organization's human resources has become a critical issue for ensuring sustained innovation capacity. The relationship between Human Resource Management (HRM) in KIFs is however still a largely unexplored arena. The objective of this paper is to explore this relationship in an effort to identify HRM practices that support innovation. To this end, the paper includes reviews of the literature relevant to HRM and innovation in KIFs and four case studies from companies in Denmark and Australia that have been recognized for excellence in innovation. On the basis of content analyses conducted on the case data, some preliminary conclusions are posited regarding the role of HRM in KIFs. More specifically, the findings from this study suggest that while there are commonalities between HRM practices in traditional manufacturing companies and KIFs, there are also important differences, especially in terms of staffing practices. The paper contributes by offering recommendations for management of HRM in innovative KIFs and potential avenues for research to further develop our understanding of how HRM can support innovation in KIFs.

Keywords: HRM, innovation, knowledge intensive firms, case study

1. Introduction

In an era when knowledge is rapidly changing, and innovating is critical to business success and sustainability, the human capital of the organization is an issue of increasing importance. Over two decades ago, Kozlowski (1987) called for Human Resource Management (HRM) to be more distinctly embedded in organizational strategy in order to facilitate innovation. Roberts (1988) also argued that the four dimensions of staffing, structure, strategy and system support were central to successful innovation, and that ensuring the organization had the right kind of people who were effectively managed were critical staffing issues. Still, there remain many questions regarding the relationship between HRM and innovation, especially in non-manufacturing contexts such as service organizations, SMEs, and what are referred to as knowledge-intensive firms (KIFs) (e.g. Frenkel et al., 1999; Newell et al., 2001). Although all types of organizations involve work processes that involve knowledge (Quinn, 1992), KIFs are generally considered to be diametrically opposite to traditional manufacturing firms in that the knowledge rather than physical or financial capital is

central to the companies' existence (Starbuck, 1992). The outputs of manufacturing and even service organizations tend to be far more tangible than those of KIFs, which most often involve a form of knowledge or expertise (e.g. financial planning, research findings). Thus, KIFs derive their competitive advantage from intellectual capital, which is defined as knowledge, information, experience, and intellectual property secured through a highly-educated and experienced workforce (Alvesson, 2000). Bontis (1998) emphasizes that the quality of the workforce enables and supports innovation and strategic renewal.

The importance of innovation to KIFs cannot be overstated and may even be a defining factor of KIFs (Lei et al., 1999). Swart and Kinnie (2003) suggest that the concept of KIFs should be restricted to those companies that create market value through exploitation of tacit knowledge in novel circumstances via effective management of a highly qualified workforce. This focus on human and social capital inherent to KIFs creates unique challenges to HRM professionals, especially in terms of acquiring and sustaining qualified knowledge workers and supporting the exploitation of knowledge (Boxall and Purcell, 2003). The research presented in this paper aims to extend the knowledge of the relationship between HRM and innovation in general, and beyond the context of large manufacturing firms in particular, by focusing on knowledge-intensive firms (KIFs). Stated more formally, the objective of this paper is to *identify and explore HRM practices of innovative, knowledge-intensive firms*. The paper provides a brief summary of the extant literature from the HRM and innovation domains, and specifically HRM and innovation in KIF's, before reporting on case study research conducted in KIF's that have been recognized for excellence in innovation.

2. Theoretical Foundation

Although the importance of effective people management to successful innovation capability has been recognized for some time (Hull and Azumi, 1984; Scarbrough 2003), empirical studies aimed at investigating the nature of this relationship are only now emerging (Laursen and Foss, 2003; Jiminez-Jiminez and Sanz-Valle. 2005). The following section reviews this literature before addressing the specific challenges KIFs might face when managing their workforce for increased innovation capacity.

2.1 HRM and Innovation

Human Resource Management (HRM) may be defined broadly in terms of all management activities impacting relationships between organization and employee (Beer et al., 1984) or more specifically as a system of operational functions such as staffing, selection, job design, training and (career) development, performance appraisal and compensation (e.g. Pfeffer, 1998). Further, there is an increasing tendency to also consider more strategic level functions such as human resource planning and forecasting (Koch and McGrath, 1996). Although there is considerable discussion regarding the relative importance of specific HRM practices and how they should be configured, there is general agreement concerning the importance of alignment between HRM practices and organizational strategy (e.g. Lengnick-Hall and Lengnick-Hall 1988).

In recent years, the relationship between HRM and innovation has been explored from various angles. One direction this research has taken assumes that HRM systems in general or HRM systems comprised of specific practices that influence innovation capacity indirectly. For instance, empirical studies lend support for the contention that HRM influences mechanisms such as development and exploitation of intellectual capital (Wright et al., 2001), knowledge creation and new product development (Collins

and Smith 2006) and organizational learning (Snell et al., 1996) that in turn facilitate innovation.

On the basis of a mixed sample of industrial firms in Spain, Jimenez-Jimenez and Sanz-Valle (2005) demonstrated a link between performance appraisal systems, incentive-based compensation, and internal career opportunities with innovation, speculating that it is the impact of the HRM practices on employee participation that provides opportunities for innovation. In a similar vein, Shipton et al. (2005) provided evidence that combining training, appraisal and induction influences different stages of the organizational learning cycle (i.e. creation, sharing and implementation of knowledge). Moreover, a study by Shipton et al. (2006) showed that not only do training, appraisal, and induction impact innovation, but that the influence of these practices may differ according to the types of innovation activities (i.e. exploitative vs. explorative). The contention that certain HRM practices impact different aspects of innovation has been conceptualized by de Leede and Looise (2005) and Jørgensen et al. (2008).

These findings contribute substantially to our understanding of the relationship between HRM and innovation, but they are also limited by having been conducted exclusively in manufacturing firms. According to contingency theory models developed by Miles and Snow (1984) and Schuler and Jackson (1987), characteristics of the organization (e.g. size, external market, industry) are critical factors in determining the appropriate HRM practices for an innovation strategy; thus, research aimed at explaining and describing the relationship between HRM in non-manufacturing environments is clearly warranted.

In the next section of the paper, the rather sparse literature on HRM and innovation in KIFs is reviewed, prior to presentation of case studies that allow for examination of HRM practices in innovative KIFs.

2.2 *HRM and Innovation in KIFs*

The relationship between innovation and HRM in KIFs has been largely unexplored despite calls for research in this area (Jackson et al., 2006). The studies that have been undertaken tend towards descriptive explanations of the HRM practices in KIF's, usually drawing on only one case (e.g. Swart and Kinnie, 2003; Verhaeghe and Kfir, 2002), or only address individual components of the equation. In a very recent literature review of research on HRM in KIFs and Multi-National Enterprises (MNEs), Majeed (2009) identified only 30 conceptual and empirical contributions related to KIFs from 2000-2006, and not all of the companies in the KIF sample could be objectively characterized as such.

Laursen and Mahnke (2001) provided one of the few empirical contributions: On the basis of survey data that suggest that large Danish companies in the manufacturing and services sectors following innovation and knowledge strategies tend to use "new HRM" practices that include interdisciplinary work groups, quality circles, planned job rotation, delegation of responsibility, integration of functions, performance related pay, and internal and external training. By design, more traditional HRM practices such as staffing and career development were not included in the study. Furthermore, while efforts were made by the authors to further refine the service sector data to depict the degree of knowledge-intensity, this was done according to their estimated potential to develop new products and services rather than the degree to which they built competitive advantage on knowledge. It is likely that this concession was made as the analyzed data were collected in 1996 when interest in KIFs was only just emerging. Nonetheless, even companies rated as being relatively knowledge-intensive cannot

necessarily be characterized as KIFs according to current conceptualizations (e.g. Alvesson, 2000; Swart and Kinnie, 2003).

While these studies all provide a useful basis for exploration of the relationship between HRM practices and innovation in KIFs, there are still numerous gaps yet to be explored. In the following section of the paper, the research design and methods used to move a step further in this exploration process are described.

3. Research Design and Methods

Given the relative paucity of research on HRM, innovation, and KIFs, we contend that a qualitative research design that allows a detailed exploration of the topic is most appropriate (Eisenhardt, 1989) for this study. Case studies were thus conducted in four firms in Denmark and Australia. To ensure an objective measure of innovation, these cases were selected on the basis of having been recognized nationally and/or internationally for their innovation performance. For simplicity's sake, data related to specific types of innovation and/or innovation activities were not included and innovative capacity is thus assumed from the companies' recognition for innovation excellence. Finally, to provide a basis for comparison, two of the firms are from the manufacturing sector, while two fulfil the characteristics of KIFs as described previously in this paper.

Data collection involved accessing organizational documents and conducting semi-structured interviews with managers directly involved with planning and implementing HRM. The interviews were designed to identify specific HRM practices used by these firms. These practices were explored to identify how they are implemented, and the perceived impact of these practices on building innovation capacity. The interviews lasted approximately 2 hours each and were tape recorded and later transcribed. Content analysis of the data was conducted to identify issues common to all companies and to contrast different approaches. A summary of these cross-case findings follows a presentation of the four cases (see Table 1).

4. Case Descriptions¹

4.1 "Scientifiks"

Scientifiks develops cutting-edge new medical technology designs for equipment to be used in hospitals and clinics around the world. Established in 2003 by a physician and three mechanical engineers with extensive experience with med-tech equipment design and development, the company currently has 118 employees, including 80 highly educated (e.g. master's/PhD level) R&D staff and six managers (the CEO and five department heads). The company has consistently grown and realized profits and has been recognized both nationally and internationally for multiple product series as well as "Good Samaritan" awards for designing and delivering diagnostic equipment to underdeveloped regions around the world.

Two members of the administrative staff manage the operational HR functions and a consultancy company handles most of the recruitment for other positions. Due to high turnover, broad job announcements run continuously in trade journals and online and members of the R&D, marketing/sales and management volunteer to present at job fairs and universities to attract new job candidates. In addition to educational requirements

¹ To protect confidentiality, pseudonyms have been used for each of the organizations.

(relevant master's degree or equivalent), applicants with experience within the field (i.e. med-tech NPD) and experience working in teams are preferred, and applicants displaying "enthusiasm and engagement for innovation and new product design are highly preferred" (quote from senior management involved in selection, January 2009). Scientifiks receives, on average, approximately 40 applications for professional positions per year and selects 4-6, although more would be hired if more qualified applications were received.

The R&D staff work mostly in permanent teams according to product type, although there is considerable overlap between products and work tasks and some of the staff work alone or in pairs during certain parts of the development process. There are no formal orientation, training, or development programs in place at Scientifiks; however this is an area the company prioritizes by purchasing both existing and customized courses in, for example, team working, problem-solving, creativity, and communication skills, several times each year from a variety of consulting companies and by making resources available for all employees to attend university courses under a "Lifelong Learning" (i.e. continuous education) program. In 2008, a "knowledge-centre" was established in the firm for the purpose of team knowledge sharing, and guest speakers have been invited each month to discuss cutting edge medical/technological research discoveries.

Formal performance appraisals are conducted annually by management "primarily for developmental purposes" (quote from one of founders, January 2009). Employees complete a self-evaluation form prior the evaluation on which they are expected to review their own performance related to any goals set with management or their teams during the previous year and to review their interactions with their teams and managers.

Compensation is "according to international standards adjusted for cost of living and other factors", according to a senior manager, with all R&D and managerial staff falling within the top tax bracket in Denmark. Although financial rewards based on quarterly and annual company performance are provided and bonuses are paid for both individual and team excellence (e.g. for development of a highly profitable new product), compensation is considered a difficult challenge for Scientifiks, as remuneration above the already high salaries is largely lost via extremely high taxes on income above a certain level. In recent years, the company has begun offering stock options and private health insurance to employees to supplement their salaries, and considerable investments have been made to create a relaxed yet supremely high-tech environment with the latest design technology.

4.2 "nature's brew"

Nature's Brew is an organic beer brewery with 18 production employees, a production manager and a general manager who is also part-owner with other partners who serve in an advisory capacity, two "R&D" staff, and the remainder in sales/marketing and administration. The company was founded in 2001 and has grown steadily during the past eight years. For two years in a row, the company has been awarded prizes for innovative products as well as environmentally-sound work practices. New products are developed in cooperation with the two members of R&D and the general manager.

The company's strategy is to be an industry leader in organic beer production in what has recently become a very competitive industry in Denmark and Europe as a whole. Due to heavy competition, the company is trying to balance its efforts on developing

new products with unique appeal, maintaining a “natural” image through environmentally sound practices, and operational efficiency.

All HR-related issues are the responsibility of the general manager, with administrative support from one of the secretaries. Recruitment is by word of mouth (positions are posted on a bulletin board) and postings with several online job search engines. Production jobs in the small plant are highly automated and thus no specific job skills are required. Turnover is relatively low due to the brewery’s location in a small rural area where jobs are scarce. Still, the company’s growth and the need to dismiss employees occasionally (usually due to unexcused absences) results in the need to post approximately 5-8 openings/year in production. Due to low unemployment in Denmark from 2001-2008, the company rarely received more than 2-3 applications per posting and selection decisions were based on the manager’s evaluation of whether the candidate would be reliable and would be quality conscious. One of the R&D staff has been with the company since its establishment, having worked at a large commercial brewery for over 20 years. He has recruited the other R&D employees (3 in all during the past 8 years). The R&D staff must be state certified to develop and oversee food/beverage production. The last hired in R&D has a food service degree (bachelor’s) in addition to his certification (a 1 year education). The general manager has a master’s degree in manufacturing engineering.

Salaries for the production workers are based on industry rates determined by union representatives with only slight variations in pay based on seniority. All employees receive a Christmas bonus (approximately one month’s pay). The R&D staff receives occasional bonuses when the company receives a reward, or when a particularly lucrative account is obtained.

Training of production workers is done on-site, with new employees being assigned to an experienced operator for a few weeks. The R&D staff attends industry mandated safety and health courses (1 week twice annually) and is encouraged to attend workshops and seminars in neighbouring countries whenever possible to keep up with industry trends. No formal appraisals have been done in the company and any performance issues are handled at the time they occur.

4.3 “GamingCo”

GamingCo was founded in 1999 by the current CEO and Creative Director who each had a different passion; one the gaming industry and the other, photography. Together they created a company that would develop new, exciting games for PC and consoles. Since that time, the company has grown exponentially, with three capital city locations in Australia. Even though the growth has meant extending beyond the small team environment of the early days, the co-founders are still extremely committed to remembering their roots and are still located in the original building where the company began, albeit with a much expanded presence.

The company has approximately 340 staff, with a large amount of the organization operating on a team structure. In addition to the administrative and professional staff, the company is divided into production teams, as well having a technical department encompassing quality assurance, and other individual staff such as a studio manager.

The company has received numerous industry awards for their products as well as being a two-time winner of the Premier’s Export Award for Arts and Entertainment. The business strategy is based on developing original intellectual property, and unlike many

of their competitors, minimizes the amount of fixed term contracts for staff, preferring to give employees a level of certainty about employment.

The key aspect of the business, game design, is organized on a project basis, and project leaders (referred to as producers) are given extensive freedom in terms of choice of team, and approach to development.

The HR function in the organization has grown significantly from one fulltime employee to handle HR issues to the current staff of six. Although having established a range of HR policies and procedures, the senior management team still has significant input into HR decisions and practices. Recruitment and selection for staff is done on an as-needed basis, however the company is involved in significant amounts of opportunistic hiring. They recognize the importance of creative, talented individuals in their teams and so when they become aware of these individuals, they will often employ them regardless of officially “vacant” positions. This strategy has recently seen the organization recruit a significant number of talented designers when a competitor was disbanded. Even through normal recruitment processes, using interviews and reference checking, heavy emphasis is put on checking the individual’s reputation within the industry and analyzing work samples provided by the applicant.

The company has established guidelines for remuneration however still maintains the flexibility to pay additional monies to highly skilled individuals recognized as key contributors to the intellectual capital of the organization. It has also been recognized that in addition to salary, individuals seek levels of recognition and reward and are therefore offered a range of benefits such as international conference attendance and personal development opportunities. Linked with this issue is the management of knowledge within the organization, which has been achieved through the recognition of key knowledge holders and the request that they conduct master classes for other individuals within the organization for which they receive additional bonuses.

Performance is managed within the team environment, and all in the team are asked to contribute feedback on an individual basis prior to the conduct of a formal performance appraisal. Overall, the company promotes a family-friendly, flexible and casual work environment, and this is portrayed in a number of ways, e.g. through informal letters to applicants, induction package presented on a CD, to the renowned Christmas party and end-of-project parties, and casual attire in the office environment.

4.4 “*Architectural Doors*”

Architectural Doors originally commenced operations in 1951 but in 1997 the company undertook a significant turnaround with drop in demand for their original product of aluminium doors, and the need to move into a new market and establish themselves in a unique position with a new product and new focus on R&D to continue to establish original, niche products.

The organization has 50% of staff in Australia but has operations in Chicago, Birmingham and Nanjing, with all labour-intensive production occurring in Nanjing due to labour costs. However, manufacturing is still done in Australia where products have unique specifications or are larger products going into the Australian market. Architectural Doors has received many awards for innovation, the latest being the 2008 National Business of the Year, and 2008 National Innovation Award. In 2008, they were also winners of the US Industry Award for Architectural Doors and screens.

The organization has a number of sections, with the R&D integrated with manufacturing and described as the Product and Engineering department. Overall, the company has four general managers: Asia Pacific, Europe, North America and Nanjing. The organization does not have a HR function, preferring instead to rely on the senior and line management to handle traditional HR functions.

In terms of recruitment, the Managing Director uses a range of sources including agencies, employee referrals and online or media advertising. Some opportunistic hiring of high performers identified by reputation and performance occurs locally and internationally. The Managing Director uses a simple formula of “function and fit”. He states that the ideal employee possesses requisite knowledge and skills as well as cultural fit with a team based organisation, and he prefers an individual who fits the culture of the organization over one who possesses skills/function but is not willing to put the organization first.

The organization uses behavioural interviewing techniques to identify individuals with the required experience, expertise and problem solving behaviours to fit the organization. The company has four categories of Employee of the Year, each aligning to one of the four core organizational values: frank, open & honest, customer service, pushing boundaries, and doing it together. In addition to the formal recognition and reward, there are also a large range of other incentives from bonuses paid on company performance to large social functions when the company wins awards or exceeds past sales records. The company also has a very detailed method of goal setting and performance monitoring, whereby individuals agree to a certain number of goals each year with their supervisor which are documented and broken down into quarterly targets. These targets are also linked to bonuses. In addition, substantial investment is made in training and development of all employees; however most external training and development opportunities are afforded to the technical and professional staff as opposed to the production workers. For these operational employees, training consists of mostly on-the-job and work-related training. For the technical and professional staff however, a wide range of options are made available including company support of additional study and particular courses for personal or professional development.

5. Discussion

In the summary of the findings from the data analyses shown in Table 1, a number of similarities between the case companies can be seen. For instance, the CEO’s and/or senior managers are all exclusively or heavily involved in selection practices at all four of the companies and Scientifiks, GamingCo, and Architectural Doors purport using specialized selection criteria (i.e. “fit” with organizational culture, desire for challenges) to aid in attaining an appropriately focussed workforce. In addition, these three companies all utilize team structures and learning and development appears to be linked to the team structures (e.g. learning through challenging projects). Further, these companies offer extensive training and development opportunities for their R&D and executive staff, practice performance management that provides employees with frequent feedback related to goal attainment, and link recognition and rewards to organizational, team, and/or individual performance to varying degrees,. Thus, the HRM practices used at Scientifiks and GamingCo, which are KIFs, are quite similar to those used at Architectural Doors, which is characterized as a manufacturing firm. Moreover, HRM practices in these three firms differ considerably from those at Nature’s Brew.

	Scientifiks (KIF)	GamingCo (KIF)	Nature's Brew (Manufacturing)	Architectural Doors (Manufacturing)
HR Strategy & Structure	CEO & Senior managers manage "HRM"; frequent use of consultants for T&D;	CEO heavily involved but HR department of 6, including a T&D officer;	No dedicated function; responsibility of general manager	Responsibility of CEO & Senior Managers; No dedicated HR function
Workforce planning	High priority but nothing currently in place; primarily ad hoc	Keep quality people employed with work – offers job security in fast changing often contract market	No formal plan	Workforce employed as new offices are established; principle of "Local companies run by local people"
Recruitment & Selection	International consulting agency + ads in trade journals + seminars at local universities; selection focuses on previous experience within + desire to be part of a dynamic environment	International recruitment for top staff; via industry contacts, entry level via universities and internships; many applicants for positions;	Internal recruitment (posted bulletins, word of mouth); announcements on job-search websites/job banks; no formal selection criteria	Internal or recruitment agencies, websites; recommendations ; Message given during recruitment: "If you want to take on challenges and do things differently you will love it here"
Work design	All team structure with exception of administrative staff	Teams an integral part of the structure (30-80 members); Projects from 6 months to up to five years; project cycles generates variety	Highly automated production with individual responsibility for specific aspects of production process	Team based multi-size projects; generating new products and solutions
Learning & Development	Developers encouraged to participate in "Lifelong Learning" & international courses/seminars; Consultants used frequently (>6 times per year); newly organized "knowledge center"	Learning by doing; self-directed experimentation and learning encouraged; Opportunities for skill development; attending international conferences between projects;	OTJ training ("mentor" program); mandated safety and food service related courses for all employees; specialized food service courses for R&D	Encourage learning through challenging projects; ongoing skill and knowledge development; Formal education possibilities for Exec. Team R&D staff; largely OTJ training for operational staff
Performance management	Annual performance reviews (individual) conducted by CEO and Senior Managers	Ongoing annual performance reviews, linked with salary review and training programs; also reviewed by key people with 360 degree feedback	No formal procedures	Company goal setting translated into "achievable outcomes" for CEO, senior managers and cascaded down to employees at all levels; annual reviews with quarterly feedback
Recognition & Reward	Quarterly bonuses linked to company performance; ad hoc bonuses tied to individual and/or team performance (no formal system)	Formal/informal on team & milestone basis; rewards usually the end of the project – celebrate success	No formal bonus/recognition program— occasional annual performance bonus paid annually on the basis of company performance	Informal to celebrate successes; Formal awards such as 4 Employee of the Year Awards around company's core values;
Remuneration	Industry standard; stock options (new in 2008); private health insurance (new in 2008)	Salaries at industry level; "We try and say we hope never to make you redundant"	Union standard for operators and administrative staff; industry standard for R&D and sales and marketing.	Profit sharing bonuses end of year profit sharing, performance pay for middle managers and above

Table 1. Summary of Findings

Team structures may facilitate learning, collaboration, and knowledge sharing in these companies. Jackson et al. (2006) posit that knowledge-intensive teams (KITs) may provide organizations with strategic advantage, as they can provide an arena for knowledge-centred activities (e.g. acquisition, sharing, combining, creation, and revision of knowledge). Further, the use of KITs is consistent with the literature that proposes that KIFs are often characterized by team communities (Boland and Tenkasi, 1995) that offer dynamic interaction (Steinmuller, 2000). The role of HRM is important in supporting KITs, according to Jackson et al. (2006), in order to ensure that the available knowledge and teamwork competencies are available within the firm, to provide opportunities for knowledge-centred activities (e.g. shared learning, challenging work), and by rewarding team performance. From this, specific HRM practices may be construed: 1) HRM should utilize thorough selection criteria and processes that secure a workforce with a desire for challenging work and a willingness and ability to work in a collaborative environment (perhaps versus technical skills alone); 2), training and development opportunities at the individual and team level; performance management systems that help align individual, team and organizational goals; and 3) performance based pay. The three firms—Scientifiks, GamingCo, and Architectural Doors—all prioritize these HRM practices.

Even though it is characterized as a manufacturing company, the Architectural Doors' integration of R&D and operational functions in teams may signal a less traditional manufacturing environment that may explain their use of "selective" selection practices, teams, performance management, and performance-based pay for (some) employees. On the other hand, teams are certainly not a foreign concept in manufacturing firms and have been linked to innovation (Goodall, 1990); thus, the lack of a team structure at Nature's Brew may be attributed to the company's small size and/or its industry affiliation rather than differences between manufacturing firms and KIFs. The lack of focus on selection, training and development, and performance management, as well as the standard remuneration practices, may also be related to size and industry; however, the clear segmentation of knowledge-centred (i.e. R&D) and operational activities may translate into Nature's Brew being much more typical of traditional manufacturing companies than Architectural Doors.

There are also HRM practices common to Scientifiks and GamingCo that are not shared by the Nature's Brew and Architectural Doors that may well be related to the knowledge-intensive vs. manufacturing environments. Specifically, while both Scientifiks and GamingCo rely at least partially on international recruitment, Nature's Brew and Architectural Doors recruit internally and/or via local agencies. Although not specifically addressed in the literature, outsourcing of recruitment to international agencies and/or via university alliances may be a way in which KIFs increase the quality of their selection pools to ensure a highly qualified workforce. Moreover, due to their reliance on a highly qualified workforce, staffing may be of more importance to KIFs than to manufacturing firms, which may explain why staffing was not included in any of the HRM systems proposed by e.g. Shipton et al. (2005; 2006), Jiminez-Jiminez and Sanz-Valle (2005), and Laursen and Foss (2003).

6. Conclusions and Contribution

The objective of this paper was to identify and explore HRM practices in innovative, knowledge-intensive firms. The findings from this research provide some initial indications about HR practices in KIF's, particularly in organisations that are recognised as leaders in innovation. Although there were differences in the national context, size and industry, there were also some similarities between the companies, which may be attributed to the fact that all four of cases drew from organisations that had excelled in the development of new products for an ever-changing marketplace. It was clear that all four firms acknowledged the key importance of knowledge, and its retention, for their organisations' competitive advantage, although there were differences in the way the firms managed knowledge. For example, the two KIFs used KITs to facilitate knowledge exploitation and hence, innovation capacity and cross-functional teams were also used in the largest of the manufacturing firms, which may signal a more modern approach to production that incorporates characteristics of KIFs. Linked to the issue of knowledge development and retention was the way these organisations chose to approach learning and development in their organisation. It was evident that the organisations provided less formal or traditional off-the-job training and were more likely to involve employees in development activities such as experimentation, networking, mentoring, or assignment to challenging projects. Moreover, these companies attempted to provide individuals and teams with opportunities for development.

As previously mentioned, the companies included in this study were selected due to their having been recognized for innovation excellence and no data regarding the types of innovation (e.g. technological, process) or innovation activities were included in this paper. Conceptual contributions by de Leede and Looise (2005) and Jørgensen et al (2008), as well as empirical studies by Shipton et al. (2005; 2006), suggest however that HRM functions may have a differential (direct or indirect) impact on innovation related to specific phases of the innovation cycle and/or operational versus strategic level of implementation. Future research should thus attempt to identify specific innovation practices and their relationship to HRM practices used in the firms.

Due to the small sample used in this study, it is not feasible to draw generalisable conclusions. Still, the common features among the KIFs (as well as the more "modern" manufacturing concern) may have implications for management in terms of the recognizing the importance of HRM, and more specifically, selection, training and development, performance management, and performance based pay, to facilitate innovation in non-manufacturing environments. The findings also highlight future avenues for research, including how HRM systems should be developed for companies focusing on both knowledge-intensive activities and production. Further, given the inclusion of only two cases in each country, future research with a much larger sample—perhaps from countries that differ considerably in terms of labour force demographics—would provide insight as to how characteristics of an organization's external environment influence HRM strategy and practice, as suggested by the contingency approach to HRM (Miles and Snow, 1984; Schuler and Jackson, 1987).

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