

Changes in HRM from Knowledge Management Initiatives: An Explorative Case in a Mexican Firm

Abstract

In today's world, where economical and political uncertainty and technological changes prevail, companies need to generate and adopt knowledge continuously in order to build a sustainable competitive advantage. The key resource is the knowledge which is intrinsic to human capital. Employees are the critical creators and bearers of knowledge in firms, companies do not think by themselves but need their workers to leverage their knowledge. In this framework, it is relevant to explore how HRM processes have been adapted in order to manage this intangible resource. This paper explores the cultural and social embeddings of knowledge and HRM processes from the evidence obtained through a case study of a Mexican firm. The findings suggest that KM has brought with it a new strategic project to HRM and its successful implementation depends on organizational culture and top management support. Additionally, recruitment, selection, training and incentives processes have to be tailored.

Keywords: Knowledge Management, Human Resource Management, Incentives, Case Study, Human Capital

The Impact of Knowledge Management Initiatives on HRM: An Explorative Case in a Mexican Firm

1. Introduction

This study aims to reflect on the implications of the theoretical perspective of knowledge management (KM) on human resource management (HRM) by presenting a case of a Mexican IT-related firm. The academic literature presents different studies which theoretically and empirically discuss the impact of KM on a firm's competitive advantage (Nonaka and Takeuchi, 1995; Grant, 1996; and Wong and Aspinwall, 2005). Three main aspects have been analyzed in this line of research. First, the necessity of generating knowledge by means of the organization's employees. The employees are the responsible for knowledge creation within the firm (Nonaka and Takeuchi, 1995; Grant, 1996). Second, knowledge that has been created within the organization by some of its members should be transferred to other individuals; in so doing, it can be known by all. Third, the knowledge generated, once transferred and received, should be integrated into the organization's existing knowledge (Zárraga and García-Falcón, 2003).

In this study, we explore how a Mexican enterprise generates and transfers knowledge and how these processes are supported by HRM. The generation and transfer of knowledge are dynamic processes that require certain capabilities which are critical for the organization to confer a sustainable competitive advantage (Barney, 1986). Therefore, in today's business dynamic HR managers and employees have a more relevant role in defining the firm's knowledge as a strategic resource.

The research interests and limitations which have arisen from some studies related to the generation and transfer of knowledge (Lapr   and Van Wassenhove, 2001; Von Krogh, Nonaka and Aben, 2001; Z  garra and Garc  a-Falc  n, 2003; Wong and Aspinwall, 2005) frequently call for a profound exploration of the phenomenon in question: to know how this phenomenon is developed in organizations and how this impact to HRM.

The following section exposes the literature review on knowledge workers, KW and HRM. Next section presents how case study was developed. As empirical evidence, a Mexican firm IT-related was chosen to examine the phenomenon under investigation. The remarkable findings were underlined in the discussion section. Conclusions and limitations of this research are mentioned in the last section.

2. Literature Review

2.1 The new work force: Knowledge workers

“The most valuable asset of a 20th century company was its production equipment. The most valuable assets of a 21st century institution (whether business or non-business) will be its knowledge workers and their productivity” (Drucker, 1969).

In 1969, the definition of knowledge worker exposed by Peter Drucker sought to describe the successors of factory workers. However, today we can define knowledge workers as participants in the knowledge-based economy which could have the advantage of being cross sectional, but it has the disadvantage that there is no agreed of straightforward definition (Brinkley, 2006:16). Brinkley (2006) suggests three ways that it can define knowledge workers:

- All those who work in the top three standard occupational classifications (managers, professionals, associate professionals).
- All those with high levels skills, indicated by degree or equivalent qualifications (professional diplomas and/or higher education).
- All those who perform tasks that require expert thinking and complex communication skills with the assistance of computers.

On the other hand, Rüdiger and McVerry (2007) explain that neither definition perfectly captures who knowledge workers are. It is lack explicit insight into who knowledge workers

really are, how they differentiate themselves from non-knowledge workers and how they perform their jobs.

Today, knowledge workers comprise a plurality of the work force. While at the beginning of the 20th century, unskilled labor accounted for about 90% of the work force, today that figure is closer to 20% (Spira, 2005). Taylor showed that in manual work there are only simple, repetitive motions. What makes them more productive is knowledge, that is, the way the simple, unskilled motions are put together, organized and executed. In fact, Taylor was the first person to apply knowledge to work (Drucker, 1999:80).

The change from factory to knowledge workers represents a significant challenge to managers who traditionally manage workers in more traditional roles. The basic difference is that a greater stock of knowledge supports a far higher level of productivity (Grant, 2000). The key point of this discussion is that different workers use different types of knowledge, this knowledge takes different lengths of time to acquire, and that without knowledge the human being is completely unproductive. Besides that, it is difficult to compare the knowledge intensity of different occupations. For survival in competitive environments all employees, especially HRM have always worked to build the best possible knowledge within their area of responsibility, which could disseminate easily to all organizational levels (Wiig, 2000:3). That why HRM has to provide with a specific storage place which all workers can access to almost all of the enterprise knowledge. This kind of storage can be an Intranet or database with documents that describe processes, activities or important documents that has to be used for work. One important aspect for an effective knowledge management is the necessity of dealing explicitly with the complexity of how people use their minds -that is, think- to conduct their work. It concerns what they must know; how they must possess specific areas of knowledge and have access to them in order to act effectively under different conditions.

Many workers are free to organize their work environment in the best way to suit their work habits; in many cases, work will be performed at a convenient time for the knowledge worker, rather than in accordance with a fixed work schedule. That alone explains why companies need to provide knowledge workers with flexible, collaborative business environments that facilitate rather than hinder knowledge work. Human capital appears to be the great intangible asset of knowledge economies (Rüdiger and McVerry, 2007). This kind of way to work is using for organization or business area involved in IT.

2.2 Knowledge Management

Knowledge-based economies, which are directly based on the production, distribution and utilization of knowledge and information (OECD, 1996), challenge the basic processes of Knowledge Management (KM): how knowledge is created, shared, transferred and stored. These processes may pose a threat to the status quo and, thus, this is what knowledge management intends to study. Organizations have always managed knowledge, even if they have not talked about it in those terms (OECD, 2004). But there is an urgently need for KM as a corporate strategy and to the knowledge economy for productivity growth more widely (Brinkley, 2006).

Early KM initiatives have approached the challenge of improving knowledge workers' productivity from an organizational perspective. If we review the studies that have dealt with the theme of knowledge management and how this contributes to the gaining of the competitive advantage of the firm, we find that this activity is centered, principally, in three aspects. First, it is necessary to generate knowledge by means of the individual; it is the individual who is responsible for its creation within the firm (Nonaka and Takeuchi, 1995; Grant, 1996). Second, the knowledge that has been created within the organization by some of its members should be transferred to other individuals so that, in this way, it can be known by

all. Third, the knowledge generated, once transferred and received, should be integrated into the already existing organizational knowledge (Zárraga and García-Falcón, 2003).

Knowledge processes such as generation, transfer and utilization are interrelated and often cannot be separated: Finding a piece of information and putting it into context might start off another search for more information. In a conversation with a colleague, a knowledge worker might ask for the location of codified information, negotiate the meaning of a concept and have a new idea at the same time, while maintaining the personal relationship. If it is possible to look at the tools that knowledge workers are provided with today, it will be seen that few tools exist that account for this process interrelatedness.

Knowledge Generation. Knowledge management currently underlines the capturing and transfer of existing knowledge, however; organizations must build business systems to create and utilize knowledge efficiently and effectively to succeed. Knowledge generation involves activities as internal knowledge creation, learning by doing and external acquisition. The knowledge generation is mainly an institutionalized activity, so that, each organization has to be able to establish creative routines and human intervention to make possible this process. The challenge is to build systems that collect the learning arising from projects and ongoing activities, to capture that knowledge in a database or document, and then spread through entire organization (Grant, 2000).

Mainly, enterprises create knowledge through the social interaction. Socialization, as Nonaka and Takeuchi (1995) have dominated the process to convert tacit knowledge to tacit knowledge, is a process of converting new tacit knowledge through joint activities such as spending time together, or working in the same office and talk about that, is a key for this conversion. Walking around inside and outside the organization is another way that provides with clear experiences that can be right to use a new tacit knowledge (Nonaka et al, 2000).

In knowledge generation process organizational culture, the fruit of experience based on tacitly shared norms of coordination and collaboration, can constitute a relevant facilitator by influencing the way in which individuals interact among themselves within an organization. In fact, more intensive communication and a culture that accepts new ideas and which is prepared to withstand the exploration of new processes and activities favors the generation of knowledge (Ruggles, 1998).

At the same time, the dynamism of this process is favored by less hierarchical organizational structures and a high participation of top managers (García and Huerta, 1999). Also, the motivation of the employees to innovate and learn lessons that allows them to obtain new and better knowledge is another significant aspect in knowledge generation (Nonaka et al., 2000). The employees are motivated to create new knowledge because they have the opportunity to learn the application of this knowledge in the business world (Zapata, 2004).

As we can see, the creation of knowledge needs human intervention. Few organizations underline the creation of knowledge, but many put emphasis on utilization of it by information technologies.

Knowledge Transfer. For Gooderham (2007), knowledge transfer can be referred to the accumulation or assimilation of new knowledge in the receiver unit. However, like Minbaeva et al. (2003:587) it is relevant to point out that pure transmission of knowledge from the source to the recipient has no useful value if the recipient does not use potentially the new knowledge and utilizes this knowledge in its own operations.

With respect to the characteristics of the actors of the process of knowledge transfer (the source and the receiver), sometimes the source of an activity to be transferred manifests a certain resistance to share his/her knowledge. This resistance can be the result of the fear of the source of losing ownership or a position of privileged power in the firm, or of the fear to

not be adequately compensated for sharing the fruits of his/her own work and effort. At the same time, the source can be reticent to dedicate somewhat more time and

On the other hand, when the source of the activity is perceived as not being very reliable, then it is very probable that the information will not be taken into consideration (Minbaeva, 2005). Direct contact is fundamental to develop mutual understanding and to eliminate what is known as being one of the basic points of friction that impede the efficient transfer of knowledge: the lack or absence of trust. Trust has been recognized as a fundamental element for the success of the transfer since people judge the reliability of the information and knowledge that is obtained principally on the basis of who the person who provided it is (Davenport and Prusak, 2001).

If we focus on the figure of the receiver, Cohen and Levinthal (1990) point out, that the capacity of assimilation is particularly important when one operates in uncertain environments. Empirical evidence of the internal transfer of knowledge suggests that the receiver, frequently, does not count on the absorptive capacity necessary to understand and efficiently incorporate a new technology into its processes (Zander and Kogut, 1995; Gupta and Govindarajan, 2000; and Tsai, 2001). Also, the resistance to the transfer is another barrier to knowledge transfer. It is not limited to innovations that were developed by companies outside of the firm itself, internally, the negative attitude of “not invented here” also exists, which inhibits the internal transfer of organizational routines (Szulanski, 1996).

As regards of the contextual elements in the sphere of knowledge transfer, O’Dell and Grayson (1998) state that firms with an open culture will have more success in its transfer process. This affirmation is corroborated by Ruggles (1998) who, in his study of knowledge management performed among European and American firms, found that the lack of an open, organizational culture which supports its members was the principal barrier for knowledge transfer. The evidence presented by this same author also indicates that the lack of support by

general management is a significant barrier for knowledge transfer. Another possible barrier would be related to physical space, as Cummings (2004) comments great physical distances make communication among members of a group difficult since opportunities of informal contact are reduced.

On the other hand, it is quite clear that technology, by itself, is not capable of making a person with acquired knowledge share it with others. Technology can amplify access and simplify the problem of bringing the appropriate knowledge to the indicated person at the right moment, but this is not sufficient. On the contrary, the use of means of communication which facilitate interaction among members belonging to an organization, different from the informal mechanisms of physically present communication like, for example, face to face and hallway chats, can also improve the knowledge transfer process. Besides reaffirming the importance of communication, this indicates that there is another component in the issue of which tool knowledge workers choose to support their work: They prefer to use *personal* tools, that is: Tools that they can control and customize to their own needs.

As can we see, knowledge, as part of intellectual capital, is the key to competitive advantage in the knowledge economy; HRM should become part of corporate strategy (Thite, 2004).

2.3 Knowledge Management and Human Resources Management

The importance of KM lies in the knowledge that individuals have: the employees, even if it is an inherently social construct. One factor in changing HRM's role is the increased reliance on knowledge workers (Beatty *et al.*, 2003). Managing knowledge is not the same thing as human resource management. KM involves managing intellectual property; that is, managing the development, transfer, and development of organizational know how. It is more multifaceted than simply managing people (Teece, 2000).

Organizational structure and management practices are changing to facilitate the implementation of KM in organizations. Nevertheless, in respect to HRM, one of the main activities is to review the compensation system, in particular incentives in their two dimensions: monetary and non-monetary. It is argued that incentives have been introduced to promote innovation-knowledge generation, effective knowledge sharing, learning, and application of best knowledge for work (e.g. Tayeb, 2005). In addition to this, another important factor is the employee perceptions of freedom, or their willingness to share knowledge with others inside and outside of the organization. This dynamic reflects the quality of the management of the enterprise as a whole (Barrett, et al; 2004).

How can an organization gain confidence that its members are working for the organization and not against it? The answer lies, in part, with performance pay and equity based compensation systems. Equity provides a sense of membership and belonging.

An example of how broadly knowledge management affects HRM is indicated in table 1.

Insert Table 1 about here

Cultural drivers such as management emphasis and personal behaviors will be changed to create environments of trust and efforts to find the root cause of problems without assigning blame. New management practices must focus on combining understanding, knowledge, skills and attitudes when assembling work teams or analyzing requirements for performing work, new work settings, such as collaboration, and new ways of assembling expertise for special purposes.

Moreover, HRM deserves an explicit consideration in the people-centered KM debate. In leading organizations and industries, people management is assumed to be one of the top

strategic priorities. It is worth mentioning the increase in research dealing with the relationship between human resource (HR) practices and organizational performance (e.g. Arthur, 1994; Huselid, 1995; Guest, 2002). Although from different perspectives and with noticeable differences as to specific practices, empirical support for the positive impact of HRM on organizational performance can be assumed.

Certainly, both knowledge and HR are being increasingly regarded as key levers of competitive advantage in today's global, dynamic and complex business environment. Importantly, people and knowledge are two inextricably joined concepts. Individual human beings are the ultimate knowledge creators and bearers. Organizations do not think by themselves, although they may have "knowledge enabling" context and memory systems. In fact, both people and knowledge are to be regarded as having special potential as scarce and idiosyncratic resources, consistent with the premises of the resource-based approach to strategic management. Indeed, a number of rigorous works exist that, while related to a resource-based view, also deal with KM or HRM.

Although managers are usually keen to recognize the relevance of human and social issues for KM initiatives to succeed, a number of structural, organization-embedded elements create obstacles to the KM efforts which are quite difficult to overcome - even despite initial managerial commitment to do so.

The literature review, concerning the relationship of KM and HRM, has centered our work on the following research questions:

1. What do organizational elements contribute to generate knowledge in IT firms?
2. What do organizational and personal factors contribute to transfer knowledge in IT firms?
3. How does HRM support the implementation of KM initiatives?

3. Methods

3.1 Exploratory research: case study

We followed a qualitative research methodology because it fitted well with the theory development maturity stage, relative emergent, of the phenomenon under study. In view of the relevance of knowledge generation and transfer as dynamic capacities, these aspects were integrated into a theoretical model and which aspects could facilitate and/or make the generation as well as the transfer of knowledge difficult were identified. Eisenhardt (1989) and Yin (1995), among others, point out that the study of cases is a method that helps to deeply understand the dynamics present within individual scenarios and to discover new relationships and concepts.

Our case study was performed in the area of telecommunication services. The selection of the case was performed so that it not only permitted getting to know the phenomenon under study as well as possible, but also that the opportunity to learn from this case specifically would also emerge. For the development of the case study, the following data-collection methods were used: i) the carrying out of semi-structured interviews of four employees of the firm, ii) direct observation, and iii) firm documentation related to the phenomenon under study.

Data was collected from June to July 2007. As a requirement for achieving construct validity, we made a truly combined use of the following multiple information sources to establish a chain of evidence that allowed for several perspectives in each case firm: in-depth, semi-structured interviews with top and middle managers, together with company websites, internal documentation provided by the company, firm brochures, and other secondary data.

3.2 Findings

Background to the Case 'Systems'

“Systems” enterprise was founded in 1991 by a visionary Mexican, who focused on the way in which telecommunications tools facilitated and optimized processes and, at the same time, had been well adopted by enterprises. It started operations in the West of Mexico with six employees and at present is a medium-sized enterprise (140 employees) with coverage across Mexico. “Systems” offers consulting projects for the designing and implementation of solutions and advanced applications in telecommunications, strongly oriented to business process optimization.

Among its services, “Systems” offers a range of solutions from convergent network applications to complete solutions for contact centers and CRM (customer relationship management) applications. In the field of convergent networks, the excelling applications are voice and data transfer applications in local and wide area networks, IP telephony and unified messenger. Other services are the contact centers, which are solutions from conventional call centers that consist of the intelligent distribution of phone calls, to sophisticated multi-channel contact centers where interactions via telephone, email and instant messenger can coexist and integrate into different CRM systems to provide customers with a consistent response no matter what contact channel they use. Regarding CRM business applications, our approach is a complete integration with the contact center to automate and improve customer service processes and increase customer retention. These services are used by universities, hospitals, public administration offices, financial institutions and manufacturing enterprises.

Its IP telephony solutions are used today by its customers as a competitive edge and provide appropriate flexibility and scalability across the enterprise.

Knowledge Generation

With respect to the generation of knowledge, it can be deduced that the organizational culture, fruit of experience based on tacitly shared norms of coordination and collaboration, can constitute a relevant facilitator by impacting on the way in which individuals interact among themselves within the organization. As the operations manager pointed out: “*our employees work in a place where they feel free to innovate, to change the way they do things*”. In fact, more intensive communication and a culture that accepts new ideas and is prepared to withstand the exploration of new processes and activities favors the generation of knowledge (Ruggles, 1998).

The dynamism of this generation process, which will provide the firm with an improvement in its competitiveness, is favored by a less hierarchical organizational structure, by an active role of general management. In *Systems* there are four levels in its organizational structure: 1) Board of Directors –represented by the founder, 2) Top management team –comprising four functional areas, 3) Middle management team – integrated by the operative supervisors and 4) Operative team.

The motivation of the employees to innovate and learn lessons thus allows them to obtain new and better knowledge (Nonaka et al., 2000). According to the results of the interview, *Systems*’ employees describe the firm as an organization that owing to its nature makes it is possible to learn continuously. The dynamic environment which *Systems* encounters provides the employees not only with the motivation to create new knowledge, but it also gives them the opportunity to learn. Employees consider that they can learn a great deal about the work they carry out and from the experience achieved by applying their knowledge (Zapata, 2004). This knowledge is created from the requirement and challenge of being informed on issues related to offering better services for both internal and external clients.

Systems has realized that its clients are the main focus of its business, the reason for being in the market. In return, it drives a strategic move to highlight customers' knowledge.

Knowledge Transfer

In terms of knowledge transfer, firms operating in dynamic environments face three main challenges: reproduction of their 1) internal competences, 2) abilities and 3) the collective learning developed and "storage" within the firm over time. For information technology SMES to be able to perform the reproduction of their *know-how* successfully, they require mechanisms that allow them to share said knowledge quickly and efficiently (Zapata, 2004).

Systems' employees use different communications channels to interact and share their knowledge. One of them is a knowledge base which makes the response time to customers (internal and external) more efficient, specifically in the maintenance area. Employees working on a customer report, first need to access the knowledge data base in order to find out how this same problem has been solved in the past. The knowledge-base system works as a decision tree. All the maintenance reports are entered into this data base.

Another current communication method is distribution lists. In this case, employees can interact with all the members of the organization. This communication channel is frequently used to share an experience or to seek assistance from any member of the firm in order to solve a problem. At the same time, *Systems'* employees have other means to share their knowledge such as by telephone, messenger, face-to-face talks, formal and informal meetings. The use of means of communication which facilitate interaction among members belonging to an organization, other from the informal mechanisms of physically present communication like, for example, face-to-face and hallway chats, can also improve the knowledge transfer process.

An effective knowledge transfer requires an organizational culture that motivates the members of the organization to search for new ways of doing things. In this search, flexibility in the performance and interaction among its members is required. This culture should be open, so as to encourage employees to share their knowledge and communication among members of the firm, even when the lack of time to share knowledge represents the principal limitation. Given the nature of *Systems*, it has been possible to observe how culture is a relevant factor in the knowledge transfer process, especially in creating a sharing atmosphere. The employees are committed to sharing their *know-how* among their coworkers. At the same time, the top management has bet on media that make knowledge transfer possible.

As regards contextual elements in the sphere of knowledge transfer, the maintenance manager pointed out: *“Here in Monterrey we do not have any problem with sharing our know-how. Our challenge has been when we decide to share it with coworkers in other cities. Without a knowledge base we had to have a telephone conversation with the expert to try to resolve a specific situation. IT introduction has diminished geographical distance limitations; in this specific case, the knowledge base”*.

Another important aspect to consider is that people are often afraid to share their knowledge. They believe that they will lose the advantage that their expertise gives them among their peers and within the organization. In the Mexican organizational culture, a knowledge transfer is possible only if the director or the top management asks somebody to share or transfer his or her knowledge to somebody else. In some enterprises the organizational culture supports the knowledge transfer. This can mainly be observed in transnational companies. The Mexican people are very possessive of what they know because it required a lot of effort to obtain it. In *Systems*, top management is trying to introduce a commitment letter. The employee who has been supported with a training course

taken outside firm has to disseminate this new knowledge throughout the firm. Right now, this organization is thinking about how its employees can become trainers. In this part, HRM plays an important role.

Knowledge Management and Human Resources Management

A central challenge for firms operating in dynamic environments is the ability to manage their employees. It could be achieved by ensuring that HRM strategies enable the creation and transfer of knowledge. HRM strategies may therefore include: external talent acquisition; internal talent development; job rotation and action learning; and contractually binding the most desired and talented employees to the organization (Evaggelia, 2007). However, more than a traditional contract, a new psychological contract (Davila and Elvira, 2007) is needed to promote loyalty and retention.

Recruitment and selection –The nature of the industrial sector where *Systems* operates requires establishing specific knowledge for quality work in the telecommunication sector. *Systems* recruits highly qualified engineers, certified by its business partners and from the most prestigious Mexican universities. *Systems* does not have a special method to recruit employees, but it believes that employee retention is related to commitment and trust. Nevertheless, there are some cases that demonstrate that employees change their job for a higher salary.

Training - *Systems* invests in more than 60 hours of training per employee per year. Training is primarily focused on state-of-the-art technologies that are developed around the world.

Knowledge by itself plays a tacit role; even when the knowledge cannot be codified in the form of a written documents, it can be taught by means of *mentoring* and learning (Winter, 1985; Zander and Kogut, 1995; Grant, 1996). In this sense, organizations have to

consider specific means which could ease the training process. For example, how workers can be formally trained in their workplace, mainly by their coworkers, as in the case of *Systems*.

Compensations – Concerning knowledge workers' careers, Evaggelia (2007:322) points out: "*The old career ladders are gone. The old lifetime employees are gone. If career ladders do not exist within one company, they must exist across different companies if they are to exist at all*". Here is where HRM practices have to change in order to retain or maintain its employees for a long time. The most popular retention strategies are related to compensation. The others are related to work environment: having freedom to plan work and encouragement from the top management.

A high pay package with performance incentives motivates personal knowledge creation, sharing and use, and also helps to attract and retain employees.

In this sense, *Systems* is thinking of developing incentives for employees to share their knowledge among coworkers. Even when, at this current time, they are committed to transferring the knowledge obtained in training courses, they will be able to get a bonus for this activity in the future. The employee will gain on two sides: one by taking external courses and the other, by receiving payment just for transferring this new knowledge.

4. Discussion

Systems has implemented a knowledge management initiative, which gives support to our research questions: *What do organizational elements contribute to generate knowledge in IT firms?* and, *What do organizational and human factors contribute to transfer knowledge in IT firms?* In this respect, it is possible to underline the relevance of knowledge generation for *Systems*, but mainly from its employees. Additionally, as has already been commented, the dynamic environment in which the information technologies firms are found

provides motivation for the employees to create new knowledge and gives people the opportunity to learn. A similar conclusion is the one which Zagarra and García-Falcón (2003) present. They found empirical support for the notion that individual autonomy, that is, the fact that the employee is permitted to work in an autonomous fashion, favors the internal creation of knowledge. In relation to the learning opportunity, employees consider that they can learn much from the work they carry out and from the experience achieved by applying their knowledge. Additionally, the opportunity to learn about questions of their interest motivates them to self-directed learning, to look for new ways of doing things for their own benefit and for that of the organization. Very similar to this conclusion are the findings of the study by Soo, Devinney, Midgley and Deering (2002), who state that a solid network of informal communication supported by an understandable technological platform promotes the organizational environment that is appropriate for the generation of new ideas.

On the other hand, *Systems* has showed how knowledge transfer can be an excellent opportunity for innovation. This was observed in the knowledge database which it has designed and developed, at this time, and how inside training by their own trainers is a program which *Systems* is working on. Both of these are innovations, excellent examples of knowledge creation. Training by inside trainers is a program that has to be managed by HRM.

The review of the literature presented shows that, for the effective transfer of knowledge, it is important that an open and receptive organizational culture, strong support from top management, little physical distance between the organizational areas, organizational media richness and sufficient time to carry out the transfer should exist in firms.

As in the process of knowledge generation, an open and receptive culture strongly affects knowledge transfer. At the same time, little physical distance between one

organizational area and another permits knowledge transfer to be performed rapidly, but in IT SMEs, the little availability of time is a prediction factor that is relevant for knowledge transfer.

The vehicles for knowledge storage and transfer can be Intranet or databases with documents that describe processes, activities or important documents that are required for work. In Mexico, a few enterprises use Intranet as the main place where employees can access information on the enterprise's main activities, to be aware about who knows what or who is an expert in a specific area. For employees is an easy way to be virtually in contact with other organizational members and to be informed of what the organization is working for.

The third research question: *how does HRM support the implementation of KM initiatives?* Can be answered on the basis of figure 1.

Insert figure 1 about here

In figure 1, we are adding three main HRM processes that are involved in KM initiatives. As we had seen in our case, recruitment, training and compensation contribute significantly to knowledge generation and transfer. New employees recruited according to a specific profile bring new knowledge with them. Training courses do not only generate knowledge among the employees who take them, but also this new knowledge can be disseminated throughout the organization. This could be possible when incentives to share it and commitment exist in the firm.

5. Conclusions and empirical implications

Two of the challenges of the firms that operate in dynamic environments are the generation and transfer of their knowledge, abilities and collective learning that accumulates

in the firm over time. At the same time, considering that knowledge is intrinsic to human capital, individual human beings are the critical creators and bearers of knowledge. It is important to consider how well these processes can be managed by HRM.

In this study, a model was design which identifies organizational and human elements that influence the generation as well as the transfer of knowledge. The results obtained point to the relevance of the role that the employee plays as the bearer of initiatives, suggestions, voluntary effort and greater commitment. Thus, organizational structures should be less hierarchically structured and management style more participatory so that the necessary conditions are created to permit preserving the flexibility of the individual.

Hence, if a successful transfer is pursued, one should opt for teaching that knowledge in a more practical and appropriate way that is adapted to the processes of every firm. By means of mentoring, knowledge uncertainty would be reduced by teaching the members of the organization about each other's competences. It is fitting to point out that in the firm under study, mentoring counts on greater acceptance, unlike other studies where the teaching of knowledge occurs frequently by means of training (Fiddler, 2000; Kogut and Zander, 1995).

The study has also shown that internal transfer of knowledge requires that the receivers be willing and committed to adopt the activity, that they count on a capacity of absorption to understand and adopt the recently acquired knowledge. For our case study, this should be translated into their members being able to count on a capacity that allows them to concentrate, adopt and apply the new knowledge to already developed activities. The study by Zander and Kogut (1995) states that, frequently, receivers do not count on the capacity of assimilation to understand and efficiently incorporate a new technology in their products or processes. In this issue, the role that HRM plays in generating incentive programs that could satisfy and commit the employees in the effectiveness of this process is relevant.

Finally, the firm under study is aware that the mechanisms that have a greater impact on the organization at the moment of transferring knowledge, such as databases and training by its own employees, requires time to be developed and applied. Unfortunately, however, they do not have time to build them. The intention exists of making knowledge transfer part of their daily activities or, at least, they are building virtual areas to carry this process out, such as messenger. What is important here is to search for physical and temporal spaces in which the transfer of this resource can be feasible. This suggests that the knowledge that is desired to be transferred needs to be a priority within the organization, that is, its transfer should be included and foreseen in the specifically HRM strategic planning.

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TABLE 1

Examples of Sole and Shared-Responsibility of HR and Knowledge Management Activities (Wiig, 2000)

HUMAN RESOURCES MANAGEMENT	ENTERPRISE KNOWLEDGE MANAGEMENT
Manage Personnel Policies	Provide general education and training programs
Conduct and monitor personnel management	Institute incentives to motivate personal knowledge creation, sharing; and use
Provide personnel relation services	Coordinate and govern Integrated Learning Programs
Hire Personnel for businesses	Establish knowledge requirements for quality work
Assist personnel evaluation	Conduct specific skill training
Support promotion assessments	Operate Intranet, personal homepages
Maintain personnel records	Operate knowledge-related personnel evaluation and review system
	Build and maintain personnel databases

FIGURE 1

Knowledge Management Supported By Human Resources Management

