

INTER-FIRM AND INTRA-FIRM ORGANIZATIONAL LEARNING AND KNOWLEDGE PROCESSES: SEQUENCE AND INTERRELATEDNESS

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Abstract

The relationship between organizational learning practices and the knowledge processes has not been extensively explored in the organizational studies of knowledge management. Using the concept of organizational knowledge gaps (Haider, 2003), this paper asserts that learning in organizations takes place because of the companies' efforts to fill their knowledge gaps by going through different knowledge processes. By demonstrate so, this empirical paper attempts to establish relationship between these two streams and that how understanding of these relationships can help companies to manage the processes of capabilities building more effectively. The study shows that these knowledge processes are interrelated and often follow a particular sequence. Furthermore, the type and nature of knowledge processes depend on the type and nature of the knowledge gaps. In other words, for learning to take place in actual organizational settings, companies do not have to undergo all the knowledge processes.

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Suggested Track: A Managing organizational knowledge and competencies

1 Introduction

The relationship between organizational learning practices and the knowledge processes has not been extensively explored in the organizational studies and knowledge management literatures despite that often these two streams seem to borrow concepts from each other in order to explain organizational capabilities and competencies building.

In the organizational learning literature, while some scholars have stated explicitly that knowledge management and knowledge development practices in firms are analogous to that of organizational learning (Fiol and Lyles, 1985; Garvin, 1993), many others have discussed knowledge transfer, knowledge acquisition, knowledge dissemination processes etc. as distinct processes of organizational learning (Duncan and Weiss, 1979; Grant and Baden-Fuller, 1995; Huber, 1991; Inkpen, 1995; Kogut, 1988; March, 1991; Shrivastava, 1986). There exists another category of scholars who argue that changes in organizational capabilities and competencies are indicators of organizational learning (Argyris and Schon, 1996). These attempts besides contributing towards the enhancement of the knowledge in the related literatures also create confusion regarding the boundaries of related disciplines. This empirical paper attempts to contribute by reporting interrelationship between these two streams and that how understanding of these relationships can help companies to manage the processes of capabilities building more effectively.

According to the findings of this study the relationship between organizational learning and knowledge processes can be explained by using the concept of organizational knowledge gaps (Haider, 2003). This paper asserts that learning in organizations takes place because of the companies' efforts to fill their knowledge gaps by going through different knowledge processes. Basing on Simon (1991) and Argyris and Schon's (1996) definitions, in which learning is stated to have three facets; 'reasons' (i.e. why companies need to learn i.e. problems), 'actions' (i.e. how companies learn) and 'outcomes' (i.e. how can we say that learning has took place), in this paper the 'reasons' aspect of the learning has been looked at by looking into how companies identify or face their knowledge gaps, the 'problems' are lack of that particular knowledge in the organization, the 'how' aspect is explained by explaining that companies fill their knowledge gaps by going through numerous processes, and

finally the 'outcome' aspect of learning is explained by verifying that knowledge gaps has been filled and some capabilities has been developed.

The findings of the study also show that knowledge processes are interrelated, as success in one process depends on other knowledge processes and often these processes seem to follow a particular sequence. Furthermore, the type and nature of knowledge processes that companies use seems to depend on the type and nature of the knowledge gaps. In other words, for learning to take place, the companies do not have to undergo all the knowledge processes. For example, in some cases companies undergo processes of initiation, acquisition, and transfer to complete the learning process whereas, in other cases, companies have to undergo processes of knowledge dissemination and internalisation for learning to take place. The paper starts by looking into the organizational learning and knowledge management literature, followed by methods, findings, and discussion and conclusions.

2 Organizational Learning and Knowledge Management

There is little consensus on what the term 'learning' means (Huber, 1991). The dictionary definition of learning simply states "the acquiring of knowledge or skills" (Oxford Dictionary, 2002). Learning, by this definition, encompasses two purposes. First, the acquisition of skill or know-how, which implies the physical ability to produce some action; second, the acquisition of know-why, which implies an ability to articulate a conceptual understanding of an experience. Whereas according to Huber (1991) an entity learns if through the processing of information exchange the range of its potential behaviours is changed. As Argyris and Schon (1996: 3) explain,

"An organization may be said to learn when it acquires information (knowledge, understanding, know-how, techniques, or practices) of any kind and by whatever means. In this overarching sense, all organizations learn for good or ill, wherever they add to their store of information, and there is no stricture on how the addition may occur. The generic schema of organizational learning includes some informational content, a learning product; a learning process which may consists in acquiring, processing and storing information: and a learner to whom the learning process is attributed."

From the above definitions, it can be said that the most common view is that learning involves acquisition and exploitation of new knowledge by the organization. As seen above, inter-organizational learning can be achieved by transferring existing

knowledge from one organization to another organization, as well as by creating completely new knowledge through interaction among the individuals. Both transfer and creation of knowledge require simultaneous transparency and receptivity, at some level, among organizations. If an organization is not transparent, no existing knowledge is disclosed and thereby cannot be received by the others or used collectively to generate new knowledge.

It is also argued in the literature that learning occurs at different levels, and each level involves very different processes and capabilities. For example, Fiol and Lyles (1985) distinguish between lower-level learning and higher-level learning. Others have made similar distinctions such as single-loop vs. double-loop learning (Argyris and Schon, 1978), behavioural level learning, and strategy level learning (Duncan, 1974), operational learning and conceptual learning (Kim, 1993). Each of these theories implies a preference to one type either for specific groups of people (higher-level vs. lower-level) or for the entire organization (double-loop vs. single-loop). Lower level learning (routines) includes learning that may be a repetition of past behaviours, or adjustments in what an organization does. Fiol and Lyles (1985) link this with Argyris and Schon's (1978) single loop learning. Higher-level learning is non-routine, which occurs through heuristics and insights in an ambiguous context and mostly at upper levels of an organization. Higher-level learning involves the development of complex rules and new actions, and it equates with double-loop learning.

For Piaget (1970), the key to learning lies in the mutual interaction of the process of accommodation and the process of assimilation. Or, as Kolb (1984: 38) states,

“Learning is the process whereby knowledge is created through the information of experience. This definition emphasises several critical aspects of the learning process as viewed from the experimental perspective. First is the emphasis on the process of adaptation and learning as opposed to content or outcomes. Second is that knowledge is a transformation process, being continuously created and recreated, not an independent entity to be acquired or transmitted. Third, learning transforms experience in both its objective and subjective forms. Finally, to understand learning, we must understand the nature of knowledge, vice versa.”

On the modes of learning there are broadly two views: individual learning and organizational learning. One view argued that organizations are comprised of individuals and must ultimately learn via their individual members. New information

originates at the individual level. However, although individuals are the agents of organizational learning, the process involves more than the cumulative learning of individuals. While organizations may not create and store information in the same way as individuals, knowledge and skills are embodied in organizational routines, practices and cultures (Badaracco, 1991). In this respect Nelson and Winter (1982: 105), in their seminal work on evolutionary theory, argued:

“To view organizational memory as reducible to individual memories is to overlook or undervalue the linking of those individual memories by shared experiences in the past.”

One of the main dilemmas shared by all those who tackle this issue was posed by Argyris and Schon (1978: 9-10):

“There is something paradoxical here. Organizations are not merely collections of individuals, yet there are no organizations without such collections. Similarly, organizational learning is not merely individual learning, yet organizations learn only through the experience and actions of individuals. What then are we to make of organizational learning? What is an organization that it may learn?”

On the other hand, a review of the knowledge management literature suggests that it is a multi-faceted, multi-layered concept definable as “any process or practice of creating, acquiring, capturing, sharing and using knowledge ...to enhance learning and performance in organizations” (Scarborough et. al., 1999: 1). Crossan et al. (1997: 372) describe knowledge management as “the consciously embedded structures, systems, and interactions designed to permit the management of the firm’s pool of knowledge and skills”. The study of inter-firm knowledge transfer forms the basis for much of the work carried out in knowledge management research. It has been argued that an organization’s ability to transfer knowledge contributes to organizational performance. A number of studies support the positive linkage between organizations’ ability to transfer knowledge and performance (Baum and Ingram, 1998; Epple et al., 1996). Hence, understanding the issues and processes relating to knowledge transfer is critical for the organizations’ long-term survival.

Inkpen and Dinur (1998) suggested that knowledge transfer from one company to another requires efforts, and these efforts create connections through which individuals can share their observations and experiences. They related the knowledge transfer stage with the ‘grafting’ process introduced by Huber (1991) in which organizations increase their store of knowledge by internalising knowledge not

previously available within the organization. According to Inkpen (1996), knowledge connections are formed through both formal and informal relationships between individuals and groups. Furthermore, while the explicit knowledge can be easily transferred, the same cannot be said of tacit knowledge, which is embedded in individual and member-member networks making it difficult to transfer.

A key question that has been implicitly identified is whether the extent to which knowledge is tacit affects the learning process and knowledge transfer (Inkpen, 1996; Simonin, 1999). Nelson and Winter (1982) state that tacit knowledge is what is usually called skills. According to Nelson and Winter (1982), tacit knowledge and skills are deeply ingrained in people or organizations i.e. they are implicit, so it becomes difficult for outsiders to imitate or copy them. Tacit knowledge cannot quickly migrate i.e. they cannot be transposed to other firms, because that knowledge depends upon specific relationships and because, unlike formulas, they cannot be clearly and completely communicated to someone else through words or other symbols (Badaracco, 1991: 82).

It can be argued from the review of literature on knowledge management and organizational learning that the above discussed knowledge management processes can be understood also in terms of learning processes. For example, individual learning and organizational learning can be used to explain knowledge creation and intra-firm knowledge transfer processes. On the other hand, organizational learning and inter-organizational learning can also explain inter-firm knowledge transfer processes. Organizational learning, in the literature, has been explained in a number of different ways, but most common to these is the view that learning involves acquisition and exploitation of new knowledge by organizations (Argyris and Schon, 1978), showing a direct link between knowledge processes and organizational learning. Similarly, Cohen and Levinthal (1989) have used knowledge acquisition, assimilation, and exploitation processes to study organizational learning. Some authors equate organizational learning with a dynamic process of creating, acquiring and transferring knowledge (Garvin, 1993), again making the connection between organizational learning and knowledge management. This paper attempts to establish this connection by using the organizational knowledge gaps concept discussed in detail elsewhere (Haider, 2003).

3 Methods

This paper is based on two case studies; Millat Tractors Limited (MTL) and Atlas Honda Limited (AHL), from the different sectors of the Pakistan automotive industry i.e. tractors and cars manufacturing. In total 97 interviews were carried out at different levels of organizational hierarchical level to investigate learning and changes taking place at each level. The empirical data were collected, mainly, through in-depth semi-structured interviews. Respondents were asked to reflect upon the critical events which took place in the history of the company. These critical events were identified from the analysis of the secondary data and were also reported by the top management during the first phase of interviews. During the interviews particular attention was paid towards unfolding the processes over time through which companies transfer, disseminate and internalise knowledge. The distinct features of the data collected are that interviews were carried out in three distinct phases and in three different languages. Each phase of data collection was followed by data analysis, report writing, interpretation of the overall findings, and review of relevant literatures.

The results of this paper are drawn using the retrospective processual analysis approach of analysing the case study companies. While there has been a growing interest in research that pays attention to the classic issue of time (Pettigrew, 1997; Ropo et al., 1997; Van de Ven, 1992) there does not exist any set format on conducting processual research as the field of processual research is still emerging and its boundaries are debatable (Orton, 1997). The above mentioned critical organizational events were found to relate to some type of organizational knowledge gaps and it was thought that the understanding of the processes of filling knowledge gaps, which leads to developing new organizational capabilities and competencies, will lead to establishing link between organizational learning and knowledge management literature.

4 The Concept of Organizational Knowledge Gaps

The concept of knowledge gaps in this research is loosely used for *all types of organizational knowledge which a company currently lacks but identifies to be critically important for its survival and growth and, hence, need to be filled*. These

include knowledge regarding organizational capabilities, competencies, technical and technological know-how, general know-how, operational know-how, managerial know-how, employees' skills, and hardware like machines and equipment. This broader definition of knowledge gaps has been used in this paper to understand the process of continuous identification and filling of the knowledge gaps by the case study companies in the course of their development.

The findings of the study show that organizations, over the course of their development, face many different types of knowledge gaps, which can be broadly categorised into five major types; physical capital related knowledge gaps, social capital related knowledge gaps, cultural capital related knowledge gaps, relationship management related knowledge gaps, and intellectual capital related knowledge gaps. Analysis of the different types of organizational knowledge gaps shows that all these knowledge gaps consist of both tacit and explicit dimensions, as discussed by Polanyi (1966). However, instead of dividing organizational knowledge into tacit and explicit dimensions, it has been observed that the degree or extent of tacitness and explicitness in these knowledge gaps differs.

The analysis of the case studies data shows that knowledge gaps emerge due to exogenous factors and endogenous factors. Exogenous factors include 'institutional forces' like changes in government policies and/or regulations, etc. and 'industrial forces' like competitive forces and industry specific changes. On the other hand, endogenous factors include changes in companies' existing repositories of knowledge, companies' strategic directions, management intentions, and existing capabilities and competencies. It was noted that exogenous factors 'impose' knowledge gaps on the companies, whereas endogenous factors lead companies to 'identify' knowledge gaps. The 'imposed' knowledge gaps are problematic for the companies as these gaps are created by exogenous factors and are forced on companies. At the time of facing such gaps, companies might not be in a position to fill these gaps. This might be due to the companies' existing strategic direction, which might not include the development of an ability to fill these gaps. Furthermore, companies might not be in a position to fill these knowledge gaps due to their lack of readiness or due to the lack of required absorptive capacity (Cohen and Levinthal, 1990) as these gaps present themselves unexpectedly. In this paper, the concept of organizational knowledge gaps is used to show that how organizational learning and knowledge management disciplines are interconnected.

5 Organizational Knowledge Processes

Organizations undergo numerous knowledge processes in their efforts to fill their knowledge gaps. These knowledge processes include the initiation process, the knowledge acquisition process, the knowledge transfer process, the knowledge internalisation process, the knowledge creation process, the intra-firm knowledge transfer process, and the knowledge dissemination process.

The findings of this study show that these knowledge processes are inter-related and are found to follow a particular sequence depending on the type of the knowledge gaps to be filled, although it is not necessary that companies undergo all these processes in order to fill their knowledge gaps. For example, in the case of filling the physical capital related knowledge gaps, organizations undergo the initiation and acquisition knowledge processes, as the acquisition of knowledge fills the knowledge gap, especially when knowledge base (skills, etc.) already exists in the organization. In the case of other types of knowledge gaps, it was found that companies also undergo processes of knowledge transfer, internalisation, and in some cases knowledge creation process. On the other hand, in the case of companies being part of a group of companies or having affiliate companies, it was also found that those companies might undergo intra-firm knowledge transfer and intra-firm knowledge dissemination processes. These knowledge processes are discussed below, followed by a detailed discussion on the inter-linkages of these processes, their sequence, and their role in filling knowledge gaps.

5.1 Initiation process to fill the knowledge gap

Although the main focus of the initiation process is on planning how the knowledge will be acquired, particular attention is also paid on deciding who will acquire that knowledge i.e. who will be the carrier of that knowledge e.g. individuals, groups, teams, etc, and how they are going to acquire that knowledge. In other words, the initiation process mainly consists of planning, selection, and orientation sub-processes.

The process of developing the plan for knowledge acquisition and transfer by individuals or groups is a laborious one and both alliance partners participate in it. Primarily companies identify by themselves the knowledge gaps and the strategies to fill those knowledge gaps, but in some cases the companies' partner also helps in these processes. It is at this stage that the representatives of both partners agree on the process of knowledge acquisition, which later on provides the basis for all the processes to follow. The In-charge of the Crankshaft Department, AHL, quoted one such example. According to him,

“Basically, both teams i.e. of Japanese member and a team from AHL did all the planning work. From our side team members were Awan Sb, Shahid Sb, and from the Japanese side were Mr. Kekota and Mr Sada, Mr Sato [Japanese team members] and from the heat treatment side Mr Kakamon. Mr Sada was the Japanese team leader, and the leader from our side was Mr Awan. I was involved in meetings in which we discussed issues regarding product inspections, reporting, and reacting to the comments that we received whenever we sent products to Japan for approval.”

(In-charge Crankshaft, AHL, p. 53)

Once the initial plan is ready and agreed upon, employees who are to attend the training course are selected. At AHL, these selected employees have to sign a bond before leaving for the course. The duration of this bond varies from five years to ten years depending on the type and nature of the training course. Besides that, some of the employees reported that they received no increment or promotion after successfully attending these courses. However, employees at MTL reported that the prospects of promotion and increments were quite high if someone has been to Massy Ferguson for any training course. The data reveal that usually people are selected from the department in which knowledge is required. Normally, employees with a number of year's prior relevant experience are selected on the recommendation of the head of that department (seniority-based selection). One of the respondents, who attended training courses, reflects upon his own experience:

“I was selected for the training course on the basis of my years of service i.e. period of service, nature of the training required, job specification and the field in which I was working i.e. vendor development.”

(Manager Vendor Development, AHL, p.201)

In most cases, it was observed that selected ones were quite aware of the developments in this regard i.e. what training course they would be attending, from where, what type of knowledge is involved, etc. They were, however, formally involved in the process only when discussions, regarding expertise to be acquired,

started during the meetings i.e. what their role was going to be and how they were suppose to perform while on the course. In case when there were a number of people available who could act as a knowledge career, the selected ones were informed through their departmental heads about the decision.

Selected employees were provided a detailed schedule of their stay at the partner's premises i.e. what they were going to do while they would have been on the training course along with training contract guidelines and company guarantee letter. According to another respondent, in the case of training courses which were more commonly used for acquiring knowledge, before travelling to partners' premises they were explained what they were suppose to do while at partner's premises. He explains,

“[Before leaving we were told] very detailed things like what would be the processes you would have been working on, what different shops and for how long. So everything was scheduled in detail. Who were the people involved, to contact, which factory to visit, where you would have learned about assembling and where you would have learned the rest [of the things].”

(Quality Control Department, AHL, p. 20)

Another respondent confirms that, overall, a proper orientation stands out to be the main factor behind fruitful learning. According to him,

“Yes we were briefed before departing for Japan, what we needed to learn. We were told the major contents of the desired outcome. We were [also] told that you would have had to concentrate on these things and while on training, of course, we also learned many other relevant things. Other than that, we also took books and other reports regarding Heat Treatment with us to learn.”

(Crankshaft In-Charge, AHL, p. 27)

Once the initiation process is over, selected employees were sent to acquire the required knowledge. The knowledge acquisition process is considered pivotal in filling the knowledge gaps as both companies spent a lot of time and money to fill these knowledge gaps. The knowledge acquisition process is discussed in detail next.

5.2 Knowledge acquisition process

The knowledge acquisition process is the one in which the required knowledge is actually acquired by the companies. It has been observed that companies acquire knowledge using three main strategies. Companies acquire knowledge by simply paying for that knowledge and physically transferring it where it was required. This was particularly true in the case of physical capital related knowledge. Secondly, companies acquire knowledge through individual, groups, and teams by undergoing the process of knowledge transfer from alliance partners to the individuals. This seems to be a widely used strategy as most of the knowledge gaps were filled using this strategy. Thirdly, the knowledge was acquired in the shape of resident engineers (alliance partners' engineers stationed at the recipient company), as in both case study companies at least one alliance partner representative was stationed permanently at the company. The presence of these engineers means that knowledge exists there and can be used whenever needed. Other than the acquisition of machines and equipment, in all three cases knowledge was acquired through individuals acting as knowledge carriers. These different strategies of knowledge acquisition are further discussed below.

It has been observed that in the case of knowledge gaps related to physical capital, the simple knowledge acquisition of bringing in the machines and equipment filled those knowledge gaps. This was especially the case when relevant prior knowledge already existed in the company i.e. the knowledge to operate those machines already existed. If that was not the case, then the knowledge related to machines and equipment was acquired through on the spot training and demonstrations, and by providing handouts and other relevant literature.

However, in case of other types of knowledge (other than physical capital related knowledge) the data showed that companies used the strategy of acquiring knowledge through individuals, groups, and teams. While individuals are always the knowledge carriers even in case of groups and teams, it has been observed that sometimes a single person is selected to acquire the required knowledge. One of the respondents, who was looking after the Quality Control Department and has worked in many production related departments, explains the focus of his training course as follows,

“.....I was trained in Japan for six months at HMCJ [Honda Motor Company Japan] sponsored by the International Labour Organization. Mine was three months on the job training course relating to different production areas. I worked in all the sections of the production department and in all the shops one by one.

.....All the standards related to assembly or processes were learned. I observed how they were assembling it. I also observed how they were operating machines. What were the check-points for the machines and for cushion assembling. I observed all these things and learned from them (on the job training and guidance). I learned these things and I taught to our workers/staff, when I came back.

(Quality Control Department, AHL, p. 19)

From the above quoted example, we can see that the knowledge was acquired to look after and manage all the processes in the particular department according to the partners' practices. This also shows that the knowledge acquired by the individuals was complementary in nature as it helped companies achieved better results by bringing in the latest relevant knowledge.

5.3 Inter-firm knowledge transfer process

The inter-firm knowledge transfer process is the one in which knowledge is transferred from outside sources to individuals, groups, or teams of the particular department of the company where the knowledge gap exists. It has been observed that the companies undergo many different sub-processes in their efforts to transfer the knowledge or in other words, individuals, groups, or teams of the company acquire knowledge from alliance partners by under going different knowledge transfer sub-processes. These sub-processes include on-the-job training at partners' premises, training courses and lectures, plant visits, in-house on-the-job training, an in-house training school and resident engineers.

On the job training means that employees on any training course work alongside partners' workers on the assembly lines at the partners' premises. These types of practices were reported by respondents to be one of the most frequently used knowledge acquisition strategies in the case study companies. Other strategy used to transfer knowledge was the visit companies or plants of other companies who were in the same business. The trainees visited these companies to see and observe how these companies were implementing different systems, of course relevant to the

training course. The main purpose behind sending trainees to visit other plants was to ensure that they knew the working system very well. In-house on the job training means 'on the job training arranged at company's own premises (in-house) provided by partners to fill the knowledge gap'.

5.4 Internalisation process

Internalisation is a process in which knowledge transferred and acquired by the individuals, groups, and teams is spread around the department to fill the knowledge gaps. In a way, this process leads to the filling of certain types of knowledge gaps. It is at this stage that the acquired knowledge is spread from one individual to many, using different strategies. The internalisation of knowledge requires constant efforts by the management. The different sub-processes of internalising the acquired knowledge include presentations and report writing, a training school, training courses, job rotation, on the job training, and constant supervision.

The Knowledge internalisation efforts start from the very first day when trainees come back after attending their training course, as they are asked to write a detailed report describing the objectives of the training and what they have learned from this training. Besides report writing, they were also asked to make presentations in different departments and share their knowledge with others. According to one respondent, he wrote a report after coming back from Japan in which he compared both Honda Pakistan and Honda Japan's manufacturing systems and processes and how can AHL learn from HMCJ and how AHL can benefit from HMCJ's experience. According to the production manager,

"When we came back, we prepared a report regarding what was our training area and what we have learned. Then we shared what we have learned with our concerned colleagues and especially our sub-ordinates."
(Production Manager, AHL, p. 191)

Inter-departmental and intra-departmental job rotations is another strategy used by both case study companies in their efforts to internalise the knowledge acquired by any individual or a group of individuals. On the job training has been found to be the most frequent used strategy to transfer knowledge from the knowledge carrier to the department where the knowledge is required. Once the individuals or groups have acquired the required knowledge, they were asked to train their sub-ordinates and

other colleagues while working along with them. The In-charge Crankshaft explains that he trained his staff and transferred his knowledge to them following the same pattern as when he was trained by the company's alliance partners. According to him,

“Using the same pattern as that of Japan when I was trained, I trained people in my department. Starting from jigs setting training i.e. what gears will be put where, I even wrote down some details for them. Then, to operate the furnace, I told them how to operate it by doing so. Initially we were 100% together and always in touch for two three months. Then they started learning and started to understand the load and, then, with the passage of time they started working independently.”

(In-charge, Crankshaft Department, AHL, p. 28-9)

5.5 Intra-firm knowledge transfer process

The intra-firm knowledge transfer process consists of processes through which the knowledge acquired by individuals, groups, teams, or departments is transferred to sister concerns or other companies in the group. Both case study companies used the knowledge acquired by the main company (case study companies) to other companies using different intra-firm knowledge transfer strategies. Both companies used their learning from their alliances as the base and spread the knowledge acquired through that learning to other companies. As pointed out by the Group secretary of Atlas Group, currently stationed at Honda Atlas Cars Limited, where he is also working as GM Administration,

“Yes that is right. Atlas Honda is known as the flagship company in the group. It got its own management strength and it commonly helps other companies. It gives them the required leadership and transfers its work experience to the new company.”

(Group Secretary and GM Administration, AHCL, p. 212)

The General Manager Human Resource Management at AHL put it in a different way by explaining that it is easier to transfer knowledge from one company to another compared to transferring knowledge from alliance partners. According to him,

“You know if you start a plant you might start with unskilled workers but when we started this plant [Sheikhupura plant] we already had another plant [at Karachi]. People from that plant came here to work on this new plant and to train the new workers.”

(GM HRM, AHL, P. 86)

It has been observed that intra-firm knowledge transfer was achieved using different strategies, predominantly changes in the management system (Hay Management System) and specialized assignments.

An important strategy used by AHL for intra-firm knowledge transfer was to develop a new management system called Hay Management System. According to this system, any employee from any company of the group can be transferred to any other company in the group if that company needs a particular type of knowledge or skill which that particular employee has. This has become an integral part of the group's management system and has also been included in the employees contract forms. That is, when they join this group, they have to accept and sign that they could be transferred to any company in the group at any time. The main reason behind adopting this system was to maximise intra-firm knowledge transfer. Another strategy used for the intra-firm knowledge transfer is specialised assignments for the employees who have the knowledge that the companies want to transfer.

5.6 Knowledge dissemination process

The knowledge dissemination process is the one in which knowledge acquired and internalised by individuals, groups, or teams is spread to other departments of the company. It has been observed that in both case study companies intentional efforts were made to disseminate the acquired knowledge company-wide. Both companies have been exercising these practices from the very early years. This is especially the case of acquired intellectual, cultural, and management related knowledge, because the whole company can benefit from these types of knowledge. For example, in the case of MTL, the training school at any given time is arranging many sorts of training courses, which are attended by workers gathered from different departments, depending on the nature of the training course. If it is focused on general concepts like kaizen, quality control, work environment etc., a couple of workers from different departments usually attend the course. Whereas, if the focus of the course is on any specialized topic like engine operations, parts utilities etc., workers from those particular departments will attend the programme. The different sub-processes adopted by the case study companies to disseminate the acquired knowledge include transferring knowledge through training schools and through different training courses.

The training school is one of the most important platforms used by MTL to transfer acquired knowledge to the concerned staff by arranging courses and asking people who have recently acquired knowledge to share their knowledge with others. MTL's training school has arranged numerous training courses and in these courses senior managers who have attended courses devised by their partners are invited to share their knowledge with the rest of the company by delivering lectures or demonstrating how to do things. The in-charge engine division at MTL explains that this school has arranged courses for all levels of the company, especially for workers. While explaining the teamwork concept at MTL, he also shed light on how this school arranges courses. According to him,

“Definitely, we have teamwork here. Our executives directly look after the work and all our workers are fully literate and we arrange three trainings a years for eight workers from PM to in-charge plant (myself). We have a HRD department which arranges these trainings.

.....they have managed a very good system for training. They select from our skilled ones and ask them to train others through their platform. If we need any documents they will arrange them. e.g. if we need anything regarding the engine assembly they will provide us, they will refine the documents, train all our workers in a circle of ten workers each. Because we cannot afford to send all the workers outside and then incorporate them in the work.”

(In-charge Engine Division, MTL, p. 134)

Another respondent reflects upon his experiences as follows,

“We have a school here in which trainings are arranged [I think] by HRD. When we joined we were provided one week on the job training in which we were told what job we were going to do and how we were suppose to do that.

.....they told us about our job etc. assembly and other systems. They have one engine there in unassembled (open) form and they told us the functions of different part; what those parts do and how they work. They provide us training in this way.”

(Worker, Engine Division, MTL, p. 106-108)

Another strategy used by the companies was to arrange training courses for the staff, especially those who lack the newly acquired knowledge but might need it in future. This was specially the case for AHL, as they did not have an in-house training school. The purpose of arranging these courses is quite similar to that discussed under the training school but, due to lack of a training school, these courses were arranged elsewhere. One of the respondents explains the focus of these courses as

specialized courses, targeted for specialized people in the company. According to him,

“Those [training courses] were basically specialized trainings regarding the assembly of the engine, because we were using two engines here so we were provided complete training on these two types of engines. How to assemble them, what are the checks, what are the procedures, then what are the quality checks, what type of tests are required and what facilities are required to carryout those tests. What equipment is required and in what phase and how to produce it [locally].”

(In-charge Engine Division, MTL, p. 129)

5.7 Knowledge creation process

The knowledge creation process is one in which companies report improvements and/or changes made in products, product technologies, processes etc. Knowledge creation stems mainly from working on the kaizen concept of Quality Circles called ‘Ayla Mayar Circles’ at AHL (throughout the company) and from the establishment of the Projects Department at MTL. The different knowledge creation activities going on in both companies are discussed below.

Not only is the concept of quality circles well known in both case study companies, but it has also been understood even at the lowest level i.e. worker’s level. Comparatively, the concept of quality circles is better embedded in the practices of workers at AHL than at MTL. At MTL currently the focus of most of the training programmes is on understanding this concept at the lowest level. Whereas, at AHL quality circles are run at various levels in all the departments.

The knowledge creation due to the quality circles is more related to the systems and the changes taking place to make those systems more effective. Besides quality circles, knowledge creation was also taking place through a Projects Department, especially at MTL. The projects department was established with the aim of understanding how products can be produced locally according to the required standards. The department looks into the existing organizational capabilities and suggests products or technologies which can be produced using those capabilities. In other words, in this department knowledge creation is taking place in sense of producing new products for new or existing markets and by changing the existing configurations. According to the manager projects,

“You know over the time, we have developed certain production capabilities. Starting from simply importing tractors in CBU form, we have come a long way and now we are producing 85% of the parts in Pakistan. So, in other words we are capable of producing almost a complete tractor in Pakistan.

In order to maximize the utilization of the existing capabilities, we explore other products as well. For example, now we are producing some multi-application products. We are working on a light commercial vehicle project and we are also negotiating with a Korean firm”

(Manager Projects, MTL, p. 250-51)

6 Discussion and Conclusions

It is evident from the above discussion that companies, in their effort to fill their knowledge gaps, undergo numerous knowledge processes: the initiation process, the knowledge acquisition process, the inter-firm knowledge transfer process, the internalisation process, the knowledge creation process, the intra-firm knowledge transfer process and the knowledge dissemination process. Each of these knowledge processes consists of many sub-processes, which are mentioned in the relevant sections and are depicted in Table 1.

Critical Organizational Events, Types of the knowledge Required, and Organizational Knowledge Gaps	Knowledge Processes	Sub-processes
	- Initiation Process	- Selection - Orientation
	- Acquisition Process	- Buying - Individuals, Groups, Teams - Resident Engineers
	- Inter-firm Knowledge Transfer Process	- On the Job training at partners' premises - On the job training in-house
	- Internalisation Process	- Job Rotation - Report writing
	- Intra-firm Knowledge Transfer Process	- Hay Management System - Specialised Assignments
	- Dissemination Process	- Training School - Training Courses
	- Knowledge Creation Process	

Table1: Organizational knowledge processes and sub-processes

As mentioned in the earlier part of this paper, these knowledge processes are inter-linked but it is not always the case that organizations have to undergo all these

processes to fill their knowledge gaps. The type of knowledge gaps determines what organizational processes a company undergoes to fill them. The sequence and inter-linkage of these processes observed is depicted in Figure 1.

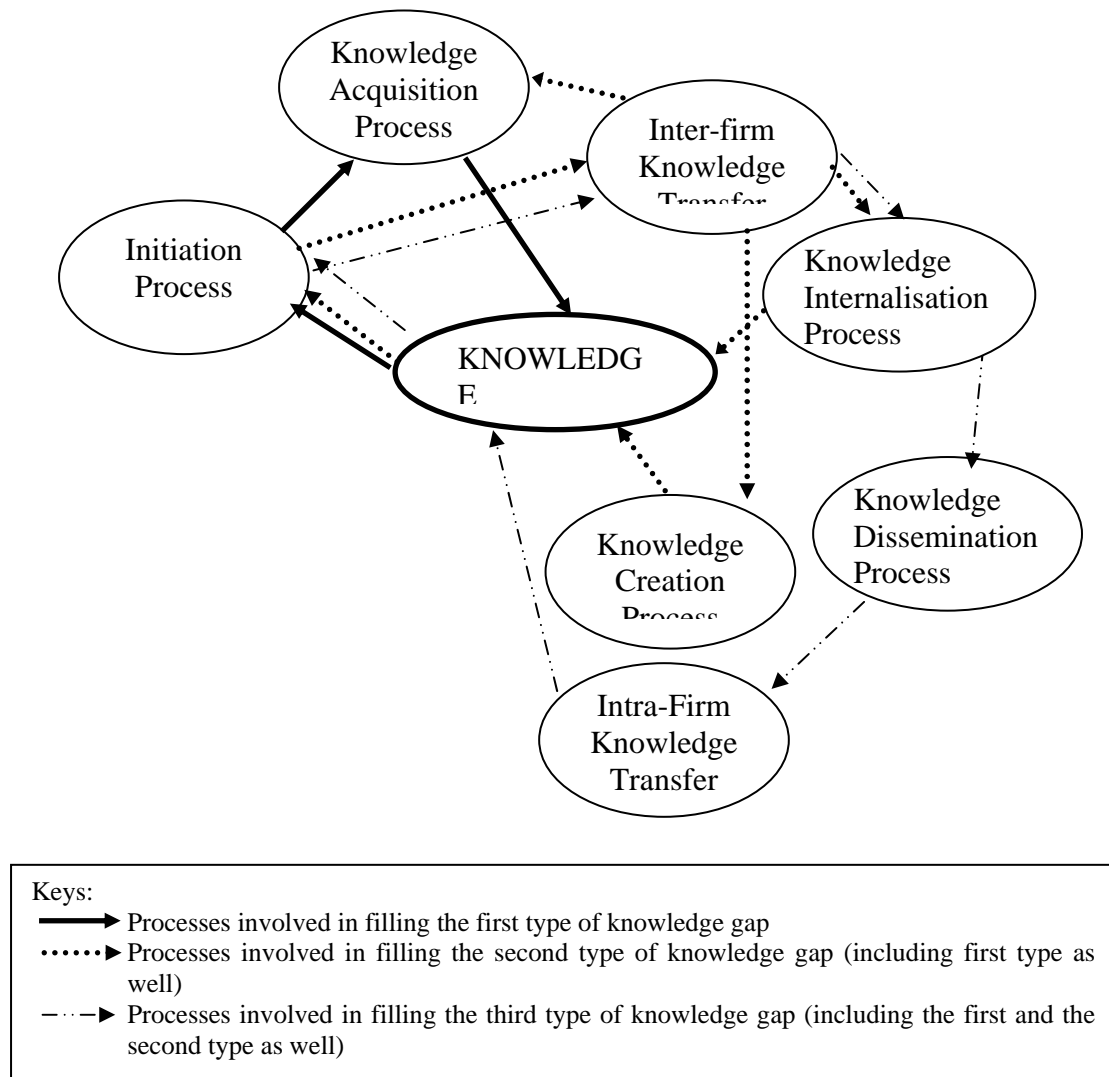


Fig. 1: Knowledge processes, inter-linkages, and knowledge gaps

For example, it is evident from Figure 1, that in the case of filling the physical capital related knowledge gaps, the companies undergo the initiation process and the acquisition process. In the initiation process, price and delivery details of the machines and equipment are agreed and in the acquisition process, machines and equipment are delivered by the outside company and acquired by the recipient company. However, in the case of other types of knowledge gaps e.g. intellectual, cultural, social, and relationship management, the companies undergo many more

processes to fill those sorts of knowledge gaps. When the knowledge gaps exist in any particular department, after the initiation process, knowledge is acquired through individuals by transferring that knowledge from the alliance partner to those individuals. This knowledge is then internalised in that particular department and on the basis of the learning from that new knowledge, knowledge gaps are filled.

The sequence of these processes is different in these cases, as after the initiation process, the knowledge transfer process is followed by the acquisition process i.e. when the knowledge is actually acquired. In cases companies' gaps are of such nature that they can be filled only after intra-firm transfer and dissemination of the acquired knowledge. Thus, knowledge gaps are filled when the knowledge is transferred and disseminated to other companies. In that case, companies have to undergo a lot more knowledge processes as shown in Figure 1. The Figure 1 also shows that in some cases inter-firm knowledge transfer and intra-firm knowledge transfer leads organizations to create knowledge internally to fill certain types of knowledge gaps.

Analysis of the data shows that most, but not all, of these processes are codified. For example, the initiation process is codified, as written instructions are available about what needs to be done once a decision to fill a knowledge gap has been finalised. The knowledge transfer process is also codified to a certain extent but it is mostly under the control of the alliance partner i.e. alliance partners have trained almost everyone undergoing the same processes. The knowledge acquisition and the knowledge internalisation processes are also codified, as people going for training have full access to the reports written by their seniors and explaining how they acquired knowledge when they were on training. On the other hand, the knowledge dissemination and knowledge creation processes are comparatively less codified. In the case of AHL, the company is trying to codify the knowledge dissemination process by working on the Hay Management System, whereas in case of MTL no such concept exists. The knowledge creation process is the least codified among all the knowledge processes especially in case of MTL. At AHL, there exists a concept of 'Ayla Mayar' i.e. removing defects by innovating, but what process should be adopted it is not clear. It is more or less a haphazard process and no one needs to innovate as a part of their job. Despite the fact that the knowledge creation process is not codified, still some innovations are continuously taking place at AHL.

On the interrelationship of organizational learning and knowledge processes, according to the findings of this study, the term learning can be explained using the concept of knowledge gaps. This means that learning in organizations takes place because of the companies efforts to fill their knowledge gaps by using different knowledge processes. As discussed in Simon (1991) and Argyris and Schon's (1996) definitions, the proposed definition of organization learning also has the potential to explain three facets of learning; 'reasons' (i.e. why companies need to learn), 'actions' (i.e. how companies learn) and 'outcomes' (i.e. how can we say that learning has took place).

The 'reasons' aspect of the learning definition can be explained by looking at the knowledge gaps identified or faced by the companies. While Argyris and Schon (1996) and Simon (1991) has included the word 'problems' to be the initial cause of the learning process, the proposed definition explains in detail that these problems are in fact the organizations' knowledge gaps. The type and nature of knowledge gaps are discussed in detail in the earlier. Similarly, while most of the definitions of learning include change/restructuring in beliefs etc. to be the actions leading to solve that problematic situation, this definition proposes that companies fill knowledge gaps by going through numerous knowledge processes. Finally, the outcome aspect of learning is explained in the literature by suggesting change and new ways of looking at the organization, this definition, however, explained that the outcome of the learning is evident by verifying that knowledge gaps has been filled. In other word, it can be judged what have been the outcome of the learning or how can we say that learning has taken place. According to the findings of this study, organizational learning can be comprehended by understanding different knowledge processes. In other words, this study falls into the category of the studies in which authors believe that knowledge management practices are analogous to that of organizational learning.

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