

## 8. Creativity, human resources and organizational learning

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### 1 INTRODUCTION

Resource-based theories of the firm draw attention to a firm's ability to explore and exploit new knowledge as the source of value creation and sustainable development (Conner and Prahalad, 1996). How to achieve a good balance between exploration and exploitation activities in a firm is a puzzling question for the manager. For the applied economist, it is difficult to develop effective criteria of decision in a dynamic context for dispatching the resources between the two activities (O'Reilly and Tushman, 2004). The problem becomes even more cumbersome in creative industries where production and creation are intimately related. In those industries, creation often occurs during the production phase. Therefore the notion of value creation and the sources of value creation become an even more important topic. Our contribution will be to add a new perspective to the debate: the distinction between division of knowledge and division of labor.

Knowledge is the essence of the resource-based perspective and it is also the source of innovation. In a strategic perspective, knowledge can be viewed on the one hand as a stock (Dierickx and Cool, 1989) or base (Asheim, 2007) when we refer to accumulated routines, skills and expertise in relation to a specific domain. On the other hand, knowledge is transformed into a flow when we refer to transfer, integration and development of new knowledge. Knowledge bases are essential for the exploitation activities of the firm and knowledge flows are indispensable in exploratory activities, creativity is then at the genesis of these flows (Kang et al., 2007; Teece, 2007). The literature highlights the necessity to adapt the governance modes dynamically to ensure an optimal fit between the resource allocated to exploration and exploitation in order to create value and to capture the created value (Youndt et al., 2004; Subramaniam and Youndt, 2005; Reed et al., 2006).

We propose a representation of how the knowledge bases are sources of value creation during the exploitation/productive activities by re-enforcing

the division of labor. Then we integrate the idea that the division of knowledge can be a source of creativity and value creation during the exploration activities. As a linchpin model we take the special case of creative activities where exploration and exploitation coexist and coevolve, and where a single type of individual stands at the crossroads of the division of labor and of knowledge. From that model basis, and following Antonelli (2006), we induce some implications on governance and on how a firm can limit opportunism and grasp the value created.

To reach our goal we use a methodology that fits intermediate theory development, an interaction between existing theory and case study findings (Edmondson and McManus, 2007). Here we reinvestigate mature bodies of literature (work on the ambidextrous firm and division of labor) through the lenses of the division of knowledge and communities in creative entrepreneurial firms. The empirical findings we call upon to illustrate and justify the theory development stem from studies on biotech, cell phones, video games and university spinoffs (Llerena and Matt, 2005; Maurer and Ebers, 2006; Burger-Helmchen, 2008; Burger-Helmchen et al., 2009, 2010).

In order to reach this deeper understanding of how learning, knowledge bases and creativity are interrelated and can be managed through adequate division of labor and division of knowledge to create and capture value, we proceed as follows. First, we reinvestigate the notion of value creation and value capture. This is done by seeking the difference between the value created by an individual, a work group or a firm as a whole. It is also the place to recall the notions of knowledge bases. Then, in Section 3 we clarify the relations between knowledge flows and bases, organizational learning and value creation and link them to the puzzles of division of knowledge and division of labor. This allows us to rephrase the notion of division of labor and division of knowledge depending on the position inside the firm or outside of the asset considered. In Section 4 we propose a linchpin model where the creative knowledge worker is the pivotal element, and in Section 5 we give some management insights concerning this specific linchpin model. A final section concludes.

## 2 CREATING AND CAPTURING VALUE: LABOR, KNOWLEDGE BASES AND KNOWLEDGE FLOWS

Value creation is a central concept in management science and economics at both the micro level (individual, group) and the macro level (the firm or nexus of firms). Nevertheless, there is little consensus on what value creation and creativity really are, where they come from, how they can

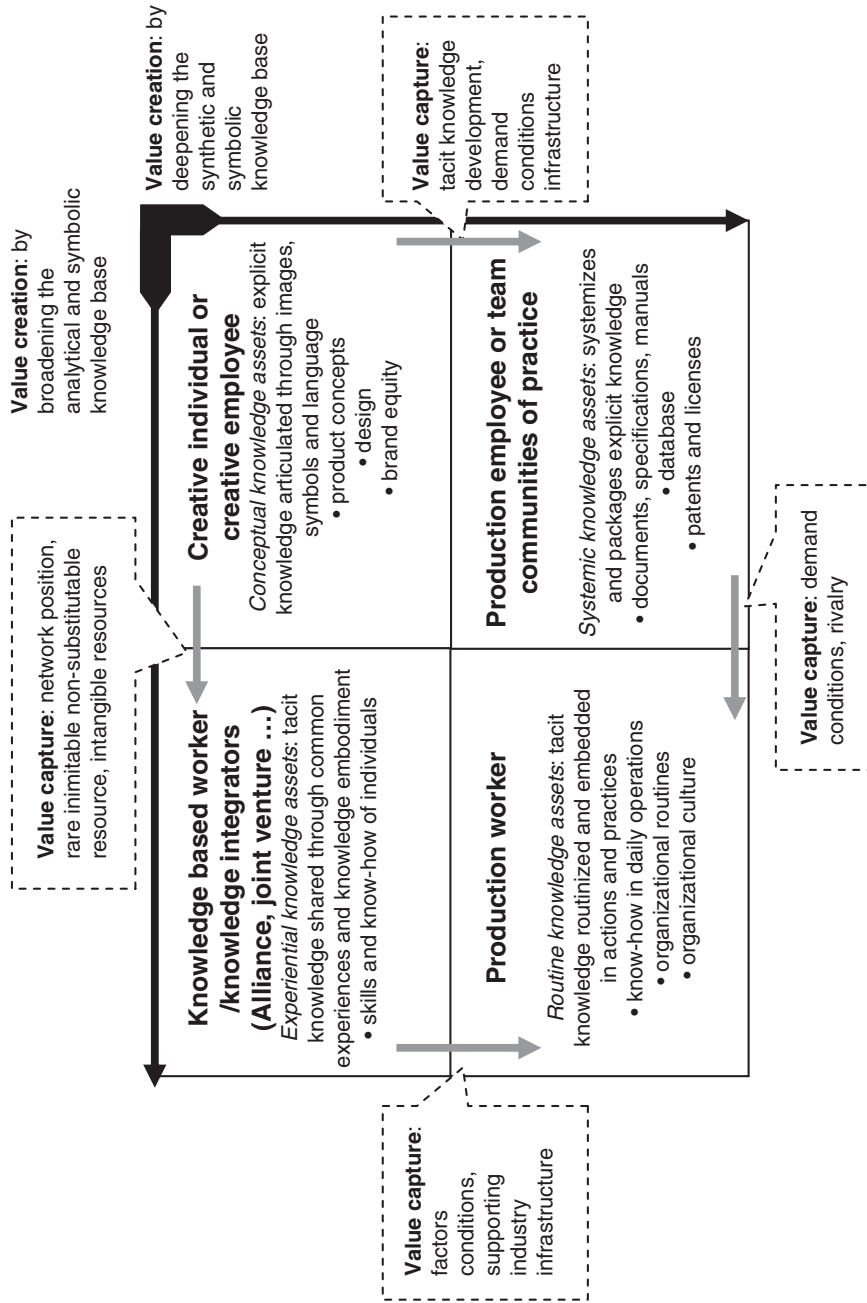
be achieved and how to capture the outcomes of the creativity. This may reflect the multidisciplinary nature and/or the multilevel aspects of value creation. Researchers in human resource management (HRM) and organizational theory rather consider value creation from the point of view of employees and teams. Finally, economists often take a broader approach encompassing several firms, a network of firms and institutions or even a whole industry or country. These few examples show the differences that may exist between these approaches. Each of them focuses on a different level of analysis for the creation of value but also for the beneficiary of the value. From a labor and knowledge perspective this raises the question of whether the division of labor is possible between the different levels of analysis (from the bottom up, an individual can divide the labor in a team or a firm, or from the top down a firm can divide the labor between the different individuals) or is the division of labor only possible on a same level of analysis if the goal is to create value by this division? The same question is relevant for the division of knowledge. Must there be a quantitatively or qualitatively greater base in one level to be able to divide that stock and dispatch it to other levels?

Value is often created at one level of aggregation and captured at another. For example an employee can develop a new way to perform a specific task, diminishing his/her effort and thereby reducing the firm's costs; it is likely that the firm will be the main beneficiary of this creation. Or, if a firm develops a new product by combining modular parts, it is likely that a network of firms (those producing the modular parts) will benefit from the creation and catch a large part of the value.

As mentioned, there are many possible vantage points in the literature on value creation depending on the theoretical stream followed. In the following we focus our efforts on three points that we link to the division of labor and knowledge in the subsequent sections. First, we discuss a definition of value creation that can take into account the interactions between various levels of analysis and different knowledge bases. Second, we illustrate how the value creation process may vary depending on the path taken by the creative activity and the intervening knowledge bases. Third, we discuss the process of value capture and show how it can change depending on the creation path. Figure 8.1 summarizes these points by representing the value creativity path and capturing processes that are possible between the different levels of analysis.

### **Value Creation and Knowledge Bases**

Value is a concept deeply rooted in the economic literature; therefore it is not surprising that management science studies of value creation



Sources: Based on Nonaka and Konno (1998), Asheim (2007), Lepak et al. (2007).

Figure 8.1 Categories of knowledge assets, value creation and value capture

follow a standard established in economics by dividing the value into (i) use value and (ii) exchange value (Bowman and Ambrosini, 2000). Use value refers to the uniqueness, quality and nature of a new job, a task, a good or service received by users in relation to their needs (price, quality, functionalities, artistic components, aesthetics, and so on). Use value is essentially subjective, relative and specific to each individual. 'Specific and subjective' because the use each may make of a product or a service can be appreciated very differently and 'relative' because the value in this case can be appreciated by referring to other products or services, the value of which are already appreciated. Exchange value is defined as the monetary equivalent that the final user gives to the supplier in exchange for the use value of the service or product. In this case, exchange value depends not on a specific individual but on the views of all individuals who may have an interest in the exchange (Hirshleifer et al., 2005: 416).

Both definitions imply that the creation of value is a subjective and relative amount obtained by an economic agent (who is the target of value creation). This agent may be an individual, a group, a firm or a nexus of firms, and this creation is marked by the willingness to exchange a specific amount of money against that value. Also the creation of value is clearly a multilevel activity going from individuals to firms: (i) the amount of money exchanged should be higher than the cost of the producer (as measured by the total costs over a given period); and (ii) the amount that the applicant is prepared to provide for the exchange depends on the expected performance difference between the new value and existing substitutes, or existing in the near future.

If those are the two basic economic features of value, management scholars developed the definition of creativity behind the value. Creativity is generally defined as the production of novel, useful ideas or solutions to a problem. It refers to both the process of idea generation or problem solving and the actual idea or solution (Amabile, 1988; Amabile and Mukti, 2008). To be able to assess the novelty of a task, product or service users must have specialized knowledge related to the subject in question and to the alternatives available. Then users will adapt the product to their own specific context. This context is dependent on the social and cultural universe in which the user employs the object. Amabile (1988) mentions the nature of value creation as a subjective and context-specific activity but also specific to the level of analysis. Users evaluate differently the novelty, value and ownership rights based on their knowledge and their representations (Boisot and MacMillan, 2004). This also implies that the supplier has a possible explanation why the product is new and in what context it can be used.

Figure 8.1 represents a matrix that we completed stepwise during this work following several aspects. In this figure we show all participants and

the different knowledge assets occurring in the creative exploration and exploitation processes. The basic drawing considers whether the employees are inside and outside the firm (the horizontal axis: on the left mainly outside the firm, on the right mainly inside the firm) and the type of knowledge used (the vertical axis: the upper row corresponds to specific intellectual assets, the lower row to more trivial assets). In the matrix we indicate the types of employees concerned in each box and the types of knowledge they are mainly handling (Nonaka and Konno, 1998). As noted by Asheim (2007, p. 224): ‘there is a large variety of knowledge sources and inputs to be used by organizations and firms, and there is more interdependence and division of labor among actors (individuals, companies and other organizations) . . . Innovation processes of these firms differ substantially between various industries and sectors whose activities require specific knowledge bases’.

We distinguish between three types of knowledge base: analytical, synthetic and symbolic. These bases correspond to different mixes of tacit and codified knowledge, skills and qualifications and lead to different forms of creativity and innovations:

- *Analytical knowledge base* This base corresponds to the know-why for the development of new knowledge in a framework depending on scientific knowledge. This type of knowledge is best obtained by collaboration within and between research units.
- *Synthetic knowledge base* This is merely know-how, applying or combining existing knowledge, and it is strongly tacit. The development of this base can be achieved through interaction with customers and suppliers.
- *Symbolic knowledge base* This corresponds to know-who, and develops strong aesthetic qualities. It is fostered by learning by doing inside specific project teams and is highly context specific.

We mention that there are different knowledge bases, but we do not say that one of these bases is pre-eminent in one of the boxes of Figure 8.1. As we shall see, to create value and be creative is not so much a question of the initial size of each base, but rather a question of how each base develops. In the following we shall see how these different bases interact to create value for the firm and link this creation of value with the notions of division of labor and division of work.

### **Creativity Paths: The Value Creation Processes**

How is value created? It is possible to represent the value creation process in many ways, depending on the level of analysis used, which is why we

chose two approaches, both of which are contingent on the level of analysis chosen or a particular source of value creation. When the individual is the level of analysis, the process on which we focus is the creative activity carried out by a certain individual by taking into account the attributes of the individual (ability, motivation, intelligence, and so on) and her/his interactions with the environment. When the organization is the source of value creation, then attributes such as the creation and management of knowledge flows become prominent.

These two approaches are linked in the following manner with Figure 8.1. If we consider the individual as the source of creativity, then we focus on the upper-right box of the matrix that we labeled 'creative individual'. If we take the firm as a source of creativity then we consider the entire right column corresponding to the firm (we then speak of 'creative employee' instead of 'creative individual'). The exchanges between the boxes in the right column are the interactions inside the firm, and the exchanges with the left column are the interactions with individuals or organizations outside the firm.

### **The individual as the source of creativity**

People create value by developing new products and services or any contributions with a certain value perceived by a user by taking into account his/her future needs and the monetary amount he/she is ready to commit in comparison to alternatives or a combination of alternatives. The creation has therefore to produce a higher utility at the same cost, or the same value at lower cost. For Felin and Hesterly (2007) and Teece (2007), the micro level of the individual should be the starting level of analysis. For these authors, knowledge creation is the source of value creation, creativity is the transformation of the stock of knowledge into a process, a dynamic, creative value. As noted by Dierickx and Cool (1989), if knowledge can be both a stock and a flow, creativity is always a flow (Amabile, 1996).

In Figure 8.1, the creative individual is characterized as a conceptual knowledge asset (Nonaka and Konno, 1998), explaining his/her knowledge and creation through images, symbols, language, and so on. These types of individuals are at the origin of the product concept, the design, and so on which corresponds to a source of possible value, but the main value is created by interacting with others. The creative individual puts down the roots of use value; the concept must be given a reality which will enhance use value and develop the exchange value. For this, creative individuals interact with knowledge-base and production workers following two different, often complementary value-creating paths.

The first creativity path corresponds to the interaction with knowledge-base workers. Those workers mainly rely on know-how, explicit technical

and scientific knowledge obtained by the embodiment of explicit knowledge by experience. When creative individuals interact with this type of worker what is obtained is the technical/scientific building of the product or service, which corresponds to the enhancement of use value. From a knowledge-base point of view, the interaction between the two types of individuals leads to the broadening of the analytical and symbolic knowledge base, by, for example, a creative process that gives a working prototype.

The second creativity path corresponds to the interaction with production workers or a production team. These are characterized as a systemic knowledge asset, producing documents, specifications, manuals, and so on, and can be assimilated, when effective, into a community of practice. The interaction between creative individuals and production work teams leads to an industrially exploitable product or service. The interaction probably creates a higher exchange value by diminishing the production costs. This concerns the synthetic and symbolic knowledge base. We can speak of a deepening of the bases rather than a broadening because what is created is a better and more detailed use of the existing stock.

### **The firm as the source of creativity**

When we consider the firm as a whole or a network of firms linked by creative activity, value creation is often a development of a sustainable competitive advantage that allows the firm to produce a unique valuable product or service. For many writers, the act of invention and innovation at the enterprise level has an intentional content much stronger than the individual level (Van de Ven et al., 1999). This upper level of intent expressed encompasses many resources allocated to the creation process (financial, technical, organizational, time allocation, and so on) that are not present in the same way at the individual level. Creativity and value creation are apparently facilitated if the firm facing uncertainty has organizational slack and is managed as an entrepreneurial organization relying on a large social network constituted by communities, partners and users (Brown and Eisenhardt, 1998). The rich literature on the dynamic capabilities is largely focused on the internal factors of firms and the renewal of the firm's operative functions through the creation of knowledge, the entrepreneurial process and also the reconfiguration of the firm's networks (Zollo and Winter, 2002; Smith et al., 2005). However, as noted by Lepak et al. (2007), this literature focuses heavily on the internal functions of the firm and not enough on the external partners and on the beneficiaries of these efforts. Lepak et al. also identify organizational practices, such as the strategic management of human resources including knowledge and labor division and governance methods as an alternative source of value



creation. Thus, the performance of knowledge-intensive firms, employees with high intellectual capital and their combinations with other assets and resources within and outside the firm can be a significant source of value creation.

From a firm's point of view, more worrying is the fact that it must decide how to organize the exchanges between the employees inside the firm with those outside the firm. It seems that the exchange with knowledge-base workers both inside and outside the firm is mainly a division of knowledge problem and that the interaction with production teams in order to obtain better performance is mainly a division of labor problem.

The division of knowledge and division of labor are two levels of management of an innovative firm. As explained by Becker et al. (2007), for Adam Smith the division of labor leads to the division of knowledge. The development of skills is more a consequence than a cause of the division of labor, in particular through learning-by-doing mechanisms. The division of labor entails a process of learning by doing that contributes to increasing skills and expertise and thus to enhancing the accumulation of specialized knowledge. The opposite position, that of the division of knowledge, implies that knowledge distribution drives the division of labor.

Therefore from a division of labor point of view a progressive specialization of work induces progressive specialized knowledge through learning by doing. This occurs under the following conditions: the pre-existing division of labor, to be coordinated, to produce given (or even changing) artefacts. As a consequence, the firm's organization follows a functional division of labor. Routines are then the 'memory' of organizations, truces to handle divergence of interests and conflicts, and the focus is on the 'activities' and their coordination (Nelson and Winter, 1982). The implications of the hypothesis 'the division of labor precedes the division of knowledge' on the theory of the firm is that transactions drive competences and define the boundaries of the firm. The explanation of networking, partnering, alliances, and acquisitions of a given firm mostly rely on strategic considerations related to the processing of information, to the level of transaction costs. In such a context it becomes extremely difficult to explain the functioning of the creative firm.

From a division of knowledge point of view, the differences in skills and 'mental labor' precede the division of labor and are also subject to learning and specialization. This suggests that one can unbundle the labor skills and pay only for the exact quantity the firm needs to produce. Many conditions must be fulfilled for such a mechanism to work. The main conditions are that there is an individual with all the necessary competences who knows how much of each type of labor must be acquired and that the required variety of labor also exists. As a consequence, the

division of knowledge does not necessarily match the division of labor; the organization/coordination of dispersed knowledge does not necessarily overlap with the organization/coordination of activities.

For these reasons, the creation of exchange value is more likely to be dependent on the division of labor, but this division is only possible when knowledge division has been achieved in the first place. Therefore the creation of value is only efficient if the firm masters the two types of creativity path. Before we discuss in more detail how a firm can do this, we investigate the capture of value mechanisms.

### **The Diffusion and Capture of Value**

As we have mentioned above, creation of value does not always go hand in hand with the appropriation of the created value. Obviously the firm must distribute the value created among employees, suppliers, shareholders and business partners. Often this distribution is fixed by contract. However, all beneficiaries of the created value are known in advance by the firm. There are other unknown beneficiaries who can capture value at the expense of the firm. This happens when use value is high but exchange value is low, or when the division of knowledge is not efficient enough to obtain a good division of labor. The difference in value can be grounded by different mechanisms affecting the relations between groups of individuals. For example, when a new product is introduced, and if it is perceived as valuable, it must increase both use value and exchange value. If it is new, the supply is limited (often only the innovator produces it) and the demand is relatively strong for a single supplier. The competitive process will attract new suppliers and reduce the gap between supply and demand, reducing prices, and therefore decreasing exchange value. This mechanism means that the firm that has spent most resources in the value creation process must share it with competitors. Of course there are ways to protect it (licensing, patenting) against this type of leakage in value, but it remains constrained due to the type of product or service (rival/not rival, excludable/non-excludable) and to the possibility for competitors to offer substitute products.

Competition is not limited to business-to-consumer relations but spreads to all levels influencing the amount of value captured by newly created businesses, for example in factors of production markets such as the labor market. In such a market if a particular type of worker is in an activity niche and requests a salary increase, this increase is limited to the value retained by the firm over the increasing costs. From the demand point of view the reverse analysis can also be done: competition between firms can lower the price, which corresponds to a growth in the value retained by the consumers. However, this competition may be limited by several

mechanisms such as specific knowledge or legal, physical and technical barriers. These mechanisms prevent or limit the replication of the process of value creation or appropriation of value created. If such barriers exist, the creator of the value has more power to retain the benefits.

### **Catching value at the individual level**

At the individual level many attributes can be the source of the appropriation of value, such as the position of the individual in a network (Baum and Rowley, 2008), the nature of relationships with others within and outside the production process and also the specialization of knowledge. This set is hardly imitable and therefore in the short term it will be difficult for competitors to deprive an individual of the value he/she has created.

### **Catching value at the firm level**

The best-known appropriation characteristics are made on the basis of a resource node characterized by the adjectives valuable, rare, inimitable and non-substitutable (VRIN). When these conditions are satisfied, the firm can benefit from these resources for some time (Barney, 2001). Also, as we have mentioned, it is only when the firm has achieved sufficient experience in the division of knowledge that it can buy the needed resources at the smallest cost. Then, to catch the created value, the firm must have the relevant match between the division of knowledge and the division of labor.

Like the process of value creation, this match can be explored following different academic perspectives. The development of the theory of the firm and strategic management in recent years bridges the views based on the resources and on knowledge. Quite naturally the first works focused on the resources and knowledge within a single firm. These resources are related to the VRIN characteristics of competitive advantage (Kogut and Zander, 1992). Then, in a second phase, attention is paid to the combination of resources and knowledge held separately by several firms and the combination reinforces the strategic nature. In this approach, the management of the division of labor and division of knowledge has become a centerpiece of the strategy and value creation (Burger-Helmchen and Llerena, 2008).

What we are interested in is the management of flows and stocks of knowledge within a collaborative relationship between individuals inside or outside the firm which implies a certain division of labor. Existing knowledge (know-how, routines) is, according to Dierickx and Cool (1989), part of the firm inventory and can be analyzed as a stock. By contrast, the knowledge being acquired by creation, learning or transfer corresponds to a flow. The knowledge stock provides firms with the foundation

of their core competences, flows of knowledge enable them to modify the existing stock. Therefore knowledge flows are part of dynamic capabilities (Kogut and Zander, 1992). This distinction is important because in the absence of flows the stock of skills of the firm is fixed and in the long run leads to the firm's decline. This implies that the management of knowledge stocks is an important activity in order to match well the division of labor with the tasks to be performed. The management of knowledge flows is equally important, adding a forecasting difficulty.

A large proportion of work in strategic management focuses on management of knowledge stocks as the source of value creation. Lepak and Snell (2002) follow this approach which allows them to represent the portfolio of knowledge of the firm and its specific management. However, the management of existing stocks of knowledge, if these stocks are distributed among several firms, immediately encompasses the management of labor flows between different groups of workers inside the same firm or employed between several firms.

The process of knowledge sharing within and between firms, and thereby the broadening and deepening of the knowledge bases, is often managed following social interaction codes rather than using IT-based processes or another formal exchange structure. It is therefore important to identify the relationships that facilitate the flow of knowledge and to organize the learning process. The objective of the following section is to clarify the value creation, this time by taking the point of view of the learning processes. For this we distinguish between two types of organizational learning (exploration and exploitation) which must both be present to efficiently create value. Then we examine the importance of the three characteristics (network structure, trust and cognition) of each of the mechanisms of learning and subsequently determine the appropriate division of knowledge and division of labor for the firm. This allows us to identify two extreme prototypes of relationships: one based mainly on the division of knowledge and the other based mainly on the division of labor. Within each prototype, the three characteristics that we have mentioned are combined to achieve the learning activity in relation to the exploitation or exploration.

### 3 CREATIVITY, VALUE, ORGANIZATIONAL LEARNING AND SOCIAL CONTEXT

The success of a firm depends on its ability to regularly create value for consumers. The source of this value creation lies in two alternative forms of learning: learning by exploration and learning by exploitation (March, 1991). Both types of learning are based on an organization with very different structures

of knowledge flows which is expressed by the costs/benefits obtained, flexibility, specialization or division of these flows. Learning through exploration is the search for knowledge that does not exist within the firm to create value. This knowledge may exist in other firms or can be radically new. The learning operation corresponds to the development of knowledge and leads to an enhancement of the value or extension of perceived value by consumers. Learning through exploitation corresponds basically to the same definition, with two main differences: expected outcomes are less radical and the costs of the learning are smaller because the learning activity is simultaneously performed with the exploitation (production activity) of the firm. In many cases, companies create value by using most of their stock of knowledge (via a better division of labor). This behavior corresponding to the learning operation is often described as less risky and less diverse, but also more incremental and more routinized (Schulz, 2001).

If we were to define the alternative learning activities by the difference between benefits and costs, then the learning through exploitation generates more short-term benefits and the associated costs are much more predictable and so it should enhance the exchange value. Incorporating the benefits of improved productivity, incremental innovation and this learning are a weak form of dynamic capabilities which can improve continuously the skills and knowledge in a stable environment by improving the integration of knowledge and division of labor.

However, as mentioned, if the firm engages only in this type of learning, it may see the overall performance deteriorating in the long term (Levinthal and March, 1993). If the firm relied entirely on this type of learning, it would deplete its stock of knowledge and fail to renew it. To avoid this, the firm can try to create value by developing radically different ideas, innovative ideas – that is, the firm must be creative. For the firm this means engaging in learning through exploration with the objective of generating flows of new knowledge, and thus radically changing the product or process. Therefore this type of learning gives the firm a strong form of dynamic capacity.

From the point of view of value creation, this type of learning is characterized by higher benefits, higher costs and deeper uncertainty, and it generates new use value. Potentially this type of learning can influence each item of the business or have no influence at all. The daily survival of a firm cannot be based solely on this type of learning because it is too random. Many empirical studies therefore conclude that the sustainable development of a firm depends on the balance between these two learning mechanisms (Kang et al., 2007). Many models exist for understanding the balance between exploration and exploitation, including the nature of production, a balanced portfolio of options, the distribution of risk,

environmental change and the division of labor and knowledge (Burger-Helmchen et al., 2009).

The general distinctions that we have mentioned show the importance of each form of learning in the creation of value, but we have not discussed the management of these forms of learning. Much of this involves management of the learning system which includes social interactions, in particular through the creation of communities. Management of learning and value creation implies the management of these communities and of contexts favorable to their creation and development (for example, the ‘Ba’, the place that favors the creation of knowledge, developed by Nonaka and Konno, 1998). To be effective, management must take into account the network structure, trust and the cognitive dimensions (Kang et al., 2007). In the remainder of this section we draw a parallel between these dimensions and forms of learning, in particular we are interested in the impact of variations on the flow of knowledge (a division of knowledge) and the divisions of labor.

### **The Network Structure Dimension**

Several authors have suggested that organizational learning is primarily determined by the structure of relations in a network – the interactions between actors – within a firm and between firms. The network structure is crucial because it gives an individual the opportunity to evaluate and appropriate the knowledge of others within the network. The best-known measures are found in Granovetter (1973) and Uzzi (1997) on the strength of ties and proximity to see the links between two members of the same network and the network density (the average intensity among all members of the network). The strength of the links depends on the frequency of relations between two individuals of the same network, while the density determines who can interact with whom.

#### **Learning by exploitation, network density and division of labor**

The density of the network and the strength of the ties positively influence learning by exploitation. The stronger the links, the more efficient the exchange of knowledge will be with a high level of sophistication and precision. The more frequently people interact, the more easily they recognize the value and importance of the knowledge of others and then try to learn from them.

#### **Learning by exploration, sparse network and division of knowledge**

Too dense links in a network can block exploration by locking individuals into a specific type of knowledge, and thus lower their creativity (Gargiulo

and Benassi, 2000). This possibility was recognized by Granovetter (1973) for whom sparse links leave the network sufficiently flexible to identify entrepreneurial opportunities and use new knowledge. A similar result can be obtained by opening the network to other firms or even users as suggested in the fast-growing literature on open innovation (Chesbrough, 2003; Von Hippel, 2006; Penin et al., 2011).

### **The Trust Dimension**

If the network structure dimension raises the issue of quantity of interactions, the affective dimension corresponds to the quality of the interaction to be experienced based on the motivations of the individuals, their expectations and behavior standards. These elements will influence the nature and quality of knowledge exchanged within the network. An expectation of reciprocity is necessary so that the network members are willing to learn and share their knowledge with others. Also, it can create value only if the members trust each other (Nooteboom, 2003).

This dimension can be studied by using two main forms of trust. Institutional trust is an impersonal form of trust which is given to people in relation to their employer firm or who belong to an institution or a group, but does not depend on their personal merits. Dyadic trust, the second form, refers to the trust between two individuals resulting from their past interactions.

### **Learning by exploitation, institutional trust and division of labor**

The literature suggests that the development of a bundle of knowledge has very little to do with the confidence that we give to the members of an institution but a lot to do with the confidence we have in institutions. Thus members of different institutions can exchange information without having to know each other in advance insofar as they trust the person on the basis of the institution to which he or she belongs. Shared standards allow the creation of value between members of different institutions who share these values, and conversely there is no value creation possible between individuals from institutions which do not share these standards. Institutional trust helps to develop knowledge in a very precise domain but does, or does not sufficiently, allow for the development of knowledge outside this area.

### **Learning by exploration, dyadic trust and division of knowledge**

Dyadic trust can develop knowledge in a rich way by facilitating learning through exploration. By its nature this type of trust allows for more flexibility and is obtained more rapidly than institutional trust.

## **The Cognitive Dimension**

The cognitive dimension is related to the nature of the exchange and addresses the issue of what is exchanged. It focuses on the importance of common representations and the same system of value, the mental models, and the same code book, all of which allow learning in the organization (Bureth et al., 2000). Many authors acknowledge that it is not possible to recognize an idiosyncratic knowledge exchange in the absence of a framework and common references. This common repository corresponds to the firm's absorptive capacity, depending on the individual and the organization.

Henderson and Clark (1990) and Nooteboom (2009) divide knowledge into two categories: knowledge related to a specific component and architectural or integration knowledge. These two sets of knowledge should be identified when companies seek to develop the value of a good or service. Knowledge related to components, as its name indicates, refers to the components, parts of modules, rather than to the whole product or service, while architectural knowledge related to the interconnection of components covers the overall product or service. The same classification applies to the body of knowledge held by an individual and the knowledge exchanged within a network. It is worth noting that each of the firms in the network is related to a particular type of learning.

### **Learning by exploitation, architectural knowledge and division of labor**

A better understanding of everyone's job and its importance in relation to the value and costs of the whole process improves the efficiency of each individual. Also, obtaining a certain level of knowledge related to architecture allows everyone to be more motivated and perform better in their own learning by exploitation (Kang et al., 2007). Therefore since each individual learns more from the exploitation activity, the knowledge related to architecture should be improved.

### **Learning by exploration, knowledge related to components and division of knowledge**

During the exploration of new areas, the need to have the same knowledge related to architecture becomes less prevalent, as it focuses on a component whose integration can be addressed only after its own definition. However, it is necessary that individuals share the same knowledge related to the components if they wish to collaborate and explore the same area.



### **Antithetical Prototype, Organizational Learning and Division of Knowledge and Labor**

Each of the three dimensions just mentioned is conceptually distinct and complementary to the others for the creation of relationships and the high creation of value. If these three dimensions are distinct conceptually they are linked in practice, as shown in a number of studies. Thus Nahapiet and Ghoshal (1998) and Yli-Renko et al. (2001) show that there is a causal relation where network structure influences trust, that trust influences cognition, cognition influences the network structure and so on. Therefore it is unproductive to separate these three effects; rather they should be put together in bundles whereby they provide synergies to each other. Kang et al. (2007) in a context similar to ours but with an HRM perspective identify two configurations of these three attributes that are consistent with learning by exploration or exploitation. Both configurations are based more on the theoretical work we have mentioned than on empirical work. These two relationships are summed up in Table 8.1.

The first row of the table represents the type that characterizes a division of labor-intensive prototype with a dense social network, strong institutional trust and shared architecture knowledge. The knowledge base involved is synthetic and symbolic because of the practical nature of the learning going on. It is based on a high degree of division of labor, but the learning process can challenge the division of knowledge (and ultimately lead to a better division of labor). This is the ideal type for learning by exploitation, a deepening of the knowledge held and a better distribution of activities corresponding to a more efficient division of labor.

In the second row, the division of the knowledge-intensive relation prototype is characterized by a sparse and flexible network, dyadic relationships between individuals sharing a common stock of knowledge about the components. This is the ideal type for learning by exploration, a broadening of the knowledge held and a better distribution of the creative fostering activities and allowing a future division of knowledge that is more efficient.

## **4 THE LINCHPIN ACTOR IN THE DIVISION OF LABOR AND THE DIVISION OF KNOWLEDGE**

In order for a firm to be able to create value for its short- and long-term needs, these two prototypes must coexist in a certain proportion without any damaging prey/foe competition over the resources. But there is no predisposition for this to happen naturally. This is the fundamental argument of

Table 8.1 *Learning forms and creativity development factors*

	Network structure	Trust	Cognitive	Value	Knowledge base involved	Intensive in	Challenges
Learning by exploitation	Dense network, strong ties	Institutional trust	Common architectural knowledge	Mainly exchange value	Synthetic and symbolic knowledge base	Division of labor	Division of knowledge
Learning by exploration	Sparse network, weak ties	Dyadic trust	Common component knowledge	Mainly use value	Analytic and symbolic knowledge base	Division of knowledge	Division of labor

Kogut and Zander on the management of organizational learning. For them, the management of the employees and the relationships between employees within a firm but also between different firms is the basic endeavor of the knowledge management activity. To be executed correctly this management must implement a division of labor and a division of knowledge. To meet this objective, we propose to concentrate our effort on a linchpin actor in the firm concerned with both types of division: the creative employee.

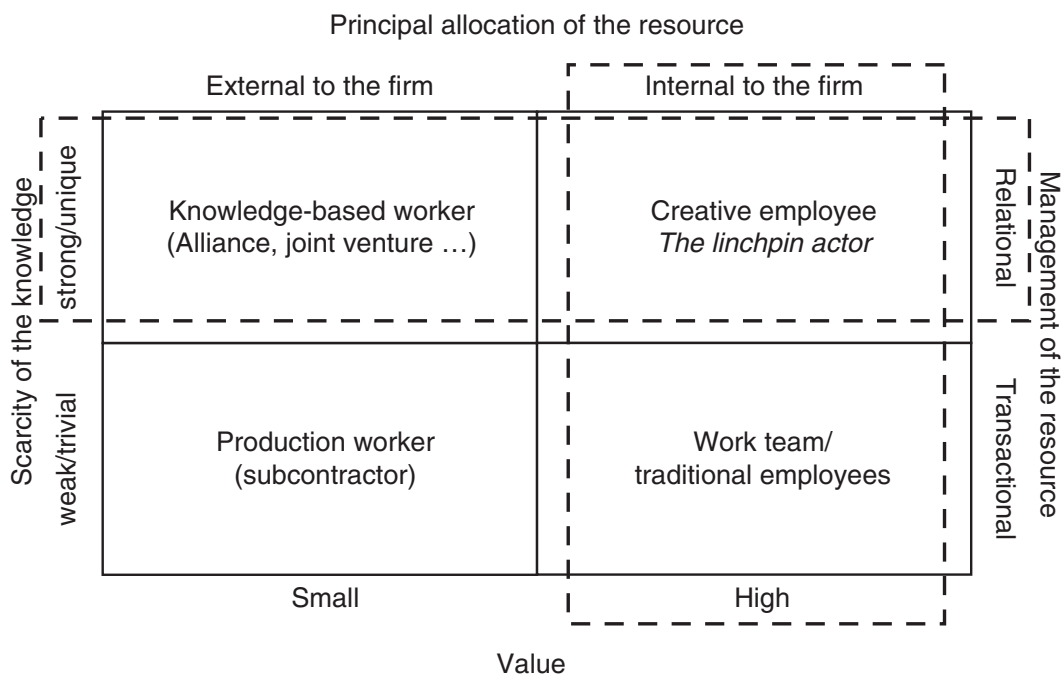
### **The Creative Employee: Between Division of Knowledge and Division of Labor**

We base our approach on a matrix inspired by the works of Lepak and Snell (1999, 2002) and the Ba types of Nonaka and Konno (1998). These authors take into account two dimensions of the value of human capital and the scarcity of these knowledge assets. This distinction allows them to highlight a preferred mode of employment (internal, external) and the form to be given to this employment (a relational or transactional basis). The character of scarcity expressed is formulated from the point of view of the firm to which the employees are primarily attached.

The value is the value added created by this activity. In this matrix, two other zones appear, one for the allocation of resources, internal or external to the firm. Clearly if the value is high the firm should ensure control by internalizing these resources. On the other hand if the value is low, the firm benefits from having them from an external partner whose form is to be specified. This observation is also valid for the case where knowledge is scarce. Indeed, if it is rare but of a low value, the firm will not have frequent use but the scarcity may be tainted by excessive costs that the firm should not have to bear over a long period. Therefore this knowledge could be externalized.

The other area corresponds to the form of management of the relationship between the firm and the individuals, whether they are within or outside the firm. But when the activity is less knowledge intensive or involves trivial knowledge, it is easier for the firm to describe what it expects and to control the execution of the tasks and the results. Such a relationship can be contracted with many details. When the relationship, on the other hand, requires rare knowledge and is therefore difficult to control, the approach is necessarily more than a contractual relationship and cannot be based on a precise description of the implementation.

Figure 8.2 shows that the critical knowledge held by employees is actually a part of existing knowledge, and it suggests that internal knowledge is primarily a stock of resources obtained by learning and inclusion of knowledge originating from outside the firm.



Sources: Based on Kang et al. (2007) and Burger-Helmchen and Llerena (2008).

Figure 8.2 Value creation linchpin from a management perspective

### Knowledge and Labor-intensive Tasks: Premium to Creativity

Is there a parallel between the three characteristics (cognitive, network structure and trust) and how the stocks and flows of knowledge can be managed to achieve better creativity? In theory, it would not be surprising to find such a relation because it would imply that the management of the opportunities, opportunism, motivation and the interaction between individuals within the same firm or belonging to different firms are of utmost importance. But this necessitates a point-by-point discussion following the nature of the two prototypes we showed previously:

- *Creative employees and cognitive connections* First, based on the intellectual capital characteristics of the partners, different forms of knowledge can be developed by and between the different employees (this corresponds to knowledge asset types in the Nonaka and Konno representation). If the partners have knowledge that can be adapted and customized to the knowledge of the firm, as is the case for service providers such as consultants or experts, then they work in a defined timeframe with some employees during a short period of time. This type of contract leads to knowledge development related

to components between partners outside the firm and employees in the firm (Brown and Duguid, 2001).

- *Creative employees and network structure* The management of employment relationships is dependent on the network structure and influences the management of the interactions between employees and partners as well as the opportunities that can be created and captured. Expectations and results vary greatly between the internal and external partners in relation to this criterion. External partners have a sparser network with the employees of the firm, especially those with strong intellectual capital and weaker ties. Therefore this type of approach is more common for interactions between different firms insofar as it concerns employees with high intellectual capital.
- *Creative employees and the development of trust* The third dimension that allows us to distinguish between individuals in those prototypes based on employment relationship is the amount of trust as well as the reciprocal obligations between employers and employees and between the employees. Lepak and Snell (1999) note that external partners and internal employees with high intellectual capital often have co-specialized knowledge, knowledge that can only be a source of value when combined. There is a synergy between the two. Such an alliance cannot be permanently maintained unless there is reciprocity between the individuals and mutual trust. Only in this case do companies develop mutual investments and mutual benefits. In this type of exchange it is essentially institutional trust that is created through the development and recognition of shared standards.

We can summarize the previous discussions in Figure 8.3. We see that creative employees with strong intellectual capital attract division of knowledge and division of labor activities. Creative employees are the linchpin between these two types of division. The relationships between knowledge-intensive workers and others are generally denser in the firm than the relations with external partners. Does this mean that any other relationship would not be strategic, that is, does not use the stocks of knowledge efficiently to create immediate value and generate flows of knowledge that allow the creation of future value? Several examples of firms that follow different strategies exist (Youndt et al., 2004). They show that firms can choose original strategies. Such strategies are not implemented naturally but indicate an intense effort of different firms that manage the stocks and flows of knowledge. They are essentially the exceptions that prove the rule. When relations between employees with high intellectual capital and external partners are governed mainly on the basis

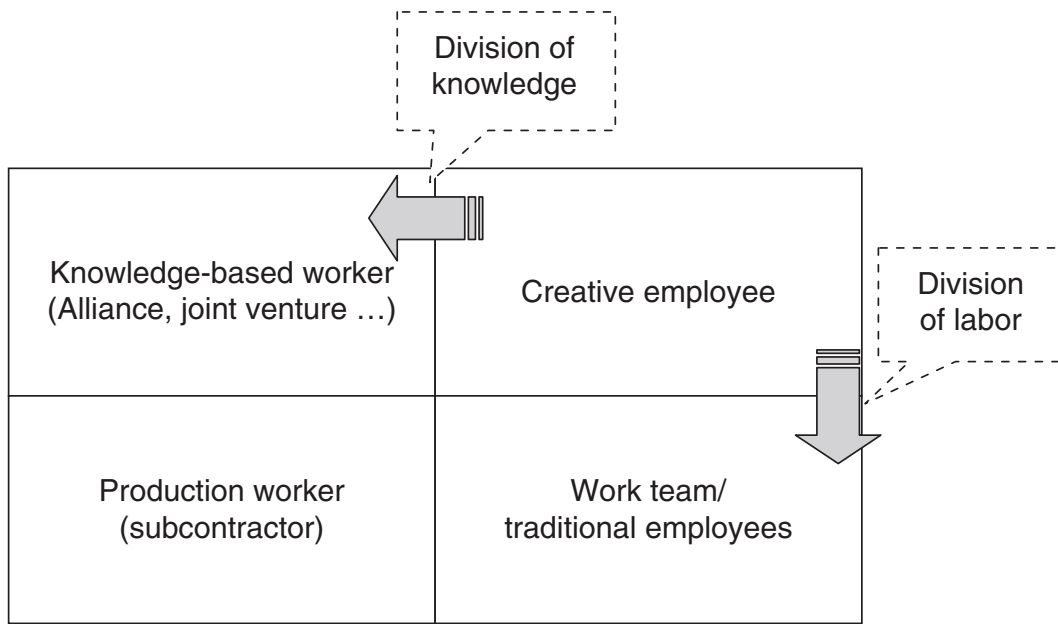


Figure 8.3 Division of labor and division of knowledge balance

of divisions of labor rules, then links between knowledge workers and the other employees reap the benefits of learning related to exploration rather than those coming from exploitation.

## 5 CREATIVE MANAGEMENT OF THE DIVISION OF LABOR AND THE DIVISION OF KNOWLEDGE

In the following we present two management techniques to develop creativity and produce value in accordance with learning mechanisms and the flows and stocks of knowledge that we described above. These two schemes are summarized in Table 8.2. The recommendations we make apply primarily to creative employees with high intellectual capital and their productions in ways that simplify their interactions with other employees (within and outside the firm).

Many studies have shown that management techniques can and must be reduced to the management of opportunities, motivation and accounting of each of the three elements that influence performance (Katz, 2003): (i) building labor structures that specify the content, scope, independence and interdependence which determine the opportunities for each employee and under what condition they interact with others in the accomplishment of tasks; (ii) the structure of incentives, including salary, performance evaluation and the safety of the employees, which provides a way to motivate

Table 8.2 Management modes of division of labor and knowledge

	Network structure	Trust	Cognitive
Division of labor	Flexible structure organization	Monetary and nonmonetary incentive based on individual results	Development of knowledge related to the specialty
Division of knowledge	Interdependent work structures	Monetary and nonmonetary incentive based on group results	Development of knowledge related to different specialties

employees to seek and acquire new knowledge; and (iii) the development of new skills (by training) which allows employees to understand and combine new knowledge.

### Management of the Division of Labor Relations

The management of the division of labor is simplest when (i) the structures of work are independent, (ii) remuneration is introduced at the team level and (iii) it allows the development of specific expertise or extends the knowledge insights that link them.

### Management of creative employees and interdependent work structures

When work is interdependent then strong links can be developed and maintained with interdependence between employees with high intellectual capital, other employees and external partners. Specifically, teamwork that requires interdependent and reciprocal interaction may help improve the interaction between these different types of employees and lead to mutual adjustments and coordination. This fosters the improvement of architectural knowledge (Brown and Duguid, 2001).

### Management of creative employees and group spirit

Institutional trust between employees with high intellectual capital and internal and external partners can be improved through initiatives creating groups and communities that reinforce goals and shared values. The creation of this type of community and reinforcement of values can also be helped by systems of performance management which focus on the collective results (Lepak et al., 2007). A system of collective remuneration can also strengthen the relationship. This system can be particularly effective if the remuneration depends on the collective performance

obtained through exchange with employees outside the firm. Indeed, it encourages people to participate in communities and to develop common frameworks.

### **Management of creative employees and the development of intraspecialty expertise**

Knowledge connected to the architecture can be built through exchanges between different functions within the firm as well as intrafirm exchange when firms are affected by the same process. Joint training can also be a way to construct knowledge related to the architecture between employees with high intellectual capital and other employees of the firm or outside of the firm. Socialization programs are practices that help employees and partners understand and internalize the values, goals, history and culture of the firm and share tacit knowledge.

### **Management of the Division of Knowledge Relations**

Unlike the division of labor, the basis of the business relationship behind the division of knowledge is the identification and exploitation of new ideas through interactions within and between enterprises. Also the management tasked with facilitating this type of relationship should strive to create infrastructures that allow flexibility to work in creative networks but also the mechanisms that enhance the flexibility of this network and its development.

### **Management of creative employees and flexible work structures**

Flexible structures authorize temporary exchanges between employees with high intellectual capital and other members within or outside the firm. This holds for both short- and long-term exchanges. This flexibility goes hand in hand with high autonomy granted to this type of shared knowledge. Autonomy and flexibility should allow for greater access to the exploration for enhanced creativity.

### **Management of creative employees and individual results**

The behavior necessary to obtain and use knowledge is difficult to identify and standardize a priori. Exchanges of knowledge for business development should not be expected if the individuals do not obtain a fair profit in return. This is why we have a system that rewards all the partners on the basis of their relationship and builds dyadic confidence. Leonard-Barton (1995) shows that the most-creative and best-paid employees are those who practice 'creative abrasion' of employees to link ideas, sometimes even conflicting ideas in order to create value.



### **Management of creative employees and the development of interspecialty expertise**

To obtain more advanced knowledge related to components an individual must develop knowledge in different specialties. Also, employees with strong intellectual capital to develop such a type of knowledge must be able to better understand and improve their own work but also to better understand the integration of different elements. To achieve this, firms may include in the employment management specific career paths in which each individual is employed in a different position successively, and therefore can broaden his/her expertise based on many different contexts and develop knowledge in relation to several specialties. This also requires that employees recognize the value of the knowledge of others.

## **6 CONCLUSION**

In this chapter we addressed the strategy of firms for managing their assets by developing the division of knowledge and labor aspects. For this, we emphasized the differences between stock and flow of knowledge in relation to the division of labor and knowledge. We investigated the relationship between employees within and between firms for value creation, and the deepening or broadening of the knowledge this implies. Then we linked learning by exploration and exploitation to the different forms of knowledge and labor division. This allowed us to specify some standard management rules which enable a firm to create value in the most efficient way.

This approach is based on a linchpin actor, at the center of all the exchange in this description: the creative employee. Future work could continue to explore the management rules by investigating the best knowledge/labor mix to capture the value and not only to create it. Also a further step could be to identify the peculiarities of some creative industries following our linchpin model.

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