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ROLES OF COMMUNITIES OF PRACTICE IN INTRA-ORGANIZATIONAL COORDINATION OF PRODUCTIVE KNOWLEDGE

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ABSTRACT

This paper aims to enhance the value of communities of practice in the process of intra-organizational coordination, as well as of the organizational learning process. Only such a paradigm can remediate to the epistemology of possession-based view and then replace it by an alternative view that favors an epistemology of practice.

Disciplinary: Organization Information & Knowledge Management (Communities of Practice in Information and Knowledge).

1. INTRODUCTION

Information and communication technologies (ICTs) have brought about critical changes in the economic environment of firms, implying the need for a deep re-examination of the modes of governance and coordination of productive knowledge. In this new economic configuration where the productive logics are more and more subjected to a regime of competition based on continuous innovation and the creation of knowledge, the traditional forms of representation of the firm show serious limits to account for this new dynamic. Contractual theories, and transactional theory, in particular, are indeed based on a vision of "resource allocation" which makes it difficult to deal with the dimension of "resource creation".

More precisely, the classical hypotheses of information accumulation in a linear process, as well as the simplistic hypotheses on the process of codifying knowledge and their limitation to the ontological level of the individual are increasingly challenged. A central idea that seems to emerge from recent work in the knowledge economy is the need to go beyond the limits of organizational knowledge to an "epistemology of possession" to extend it to an "epistemology of practice", in the terms of Cook and Brown (1999). Organizational knowledge is traditionally considered to be "possessed" by agents. The formation of new knowledge and the exchange and exploitation of

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existing knowledge are seen as processes triggered by learning mechanisms distinct from the forms of knowledge possessed. This vision of knowledge is necessarily reductive: on the one hand, it eliminates the knowledge-in-action that provides and shapes practice; on the other hand, it considers only the objective part of knowledge and eliminates subjective and contextual contingencies (Bourdieu, 1980). However, it is these idiosyncrasies and particularisms that are most important in productive knowledge (Hayek, 1945; Penrose, 1959).

To better grasp this dynamic and evolving nature of knowledge, we propose in this paper to explore these new forms of intra-organizational coordination of knowledge-in-action and to highlight the situated perspective (for example, Lave and Wenger, 1991; Brown and Duguid, 1991). To this end, we rely on the seminal works of Lev Vygotsky and Pierre Bourdieu, founding works for any theory of practice. These seminal works seem to find a promising extension in the recent literature on "communities of practice" (Lave and Wenger, 1991; Brown and Duguid, 1991; Wenger, 1998; Bowles and Gintis, 2000; Amin and Cohendet, 2004). In this work, we draw up a state of the art of this literature, which is now bloated, and we develop a conceptualization of the intra-organizational coordination of productive knowledge linking the theory of the firm to the theory of practice.

2. LIMITS OF TRADITIONAL ORGANIZATIONAL METHODS OF COORDINATING PRODUCTIVE KNOWLEDGE

2.1 THE LIMITS OF TRANSACTIONAL THEORIES

The traditional representation of the firm through contractual theories marks serious limits to account for the new dynamic of the economy based on the creation of intangible assets. The main limitation of contractual theories seems to be their restriction to the dimension of "resource allocation" to the detriment of a vision-oriented towards "resource creation".

Traditionally, in the tangible industrial economy, the contractual theories of the firm and the theory of transaction costs in particular (Coase, 1937; Williamson, 1975, 1985), which is today the dominant form of representation of the firm, have shed light on hierarchical forms of governance as a mode of coordination responding to "market failures". The existence of the organization is then explained by the existence of transaction costs corresponding to the resources mobilized to complete a transaction on the market: the organization exists because the cost of carrying out specific transactions is lower inside of the organization than on the market. The transactional analysis thus replaces the "invisible hand" of the market with a "visible hand"

"Of managers prescribing rules and coordinating the incentives, behaviors, and actions of agents in accordance with the objectives of the organization.

With the advent of a knowledge-based economy (Abramowitz and David, 1996; Foray and Lundvall, 1996; Drucker 1998), this contractual representation, more or less adapted to the tangible economy, begin to mark serious limits. This is reflected in many recent contributions mainly in terms of the limits of the transactional approach to account for the processes of production and dissemination of new knowledge. The transactional theory supposes that the firm is located in a context of resource allocation, with given productive capacities. The firm is conceived there as an institutional device making it possible to set up the appropriate incentives to correct the informational biases which authorize behaviors of unproductive research of opportunistic rents. It is indeed a theory of the firm founded on the problems of exchange, where the aspect creation of

resources is neglected, or completely secondary.

Without questioning the vital need for intra-organizational coordination by hierarchical authority, given that even in a knowledge-based economy, the problems of resource allocation and transaction costs are always significant, this contribution rather aims to highlight the inadequacy and limits of the transactional approach to account for the organizational dynamics of resource creation.

On the one hand, "hierarchy failures" appear to us to fall within the range of the limits already well known in the tangible economy, linked to long-term organizational dynamics. Indeed, as Langlois (1993) points out, the transaction cost in the Coasian sense is essentially a short-term cost, which means that it does not take into account the long-term dynamics assuming the automatic resolution of uncertainties and conflicts through the “routines” on which production is based (Nelson and Winter, 1982) as well as social and cultural norms. The problems of opportunism indeed diminish considerably in the long term, organizational routines (Cohen et al., 1996), and cultural and social norms playing a central role in the reduction of opportunistic behaviors by invoking and conveying the memory of past interactions. Langlois concludes that the existence of firms is not solely due to short-term transaction costs. The long-term dynamics point to two major shortcomings in the hierarchy; failures relating to the management of cognitive asymmetries and failures related to the cognitive capacities of agents:

(i) In a context of resource creation, contractual arrangements for saving transaction costs come up against particular difficulties in their objective of channeling the behavior of agents in the direction desired by the hierarchy. Indeed, organizational knowledge becoming more and more dispersed and idiosyncratic, in Hayek's sense, the agents holding it gains more and more negotiation power vis-à-vis the hierarchy (Foss, 2002). Cognitive asymmetries then become more salient in this new framework than information asymmetries and the risks of opportunism. These new asymmetries are unlikely to be "taken care of" by conventional modes of hierarchical coordination.

(ii) Another difficulty to be dealt with by hierarchy in the long term is that the transactional approach supposes that the cognitive capacities of the agents are either supposed to be given or supposed to be deformed homothetically according to the information accumulated by the agents. There is little room for real learning, understood as a transformation of agents' cognitive abilities or distortion of cognitive distances between agents. Again, transactional analysis of "sins" by short-termism.

On the other hand, new hierarchy failures appear in connection with the advent of a knowledge-based economy. These are mainly failures relating to the complex nature of the innovation and new knowledge production processes, that is to say, the dimension of resource creation:

When we observe the concrete "organizational forms" of the firm to which Williamson refers, the transactional approach marks limits to account for the process of creating resources: if the forms of horizontal and vertical coordination allow the organization to Be efficient in the performance of routine tasks integrating existing knowledge, they encounter insurmountable difficulties when it comes to reporting on the coordination of innovative tasks aimed at the production of new knowledge. The specialization inherent in horizontal coordination hampers, as Marengo (1994) has shown, the efforts of the hierarchy to foster creative collaboration between separate functional

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divisions. Likewise, if vertical coordination facilitates communication to the knowledge base and commands of the hierarchy, it is ineffective in coordinating non-routine tasks.

Knowledge-producing activities involve problems of externalities and high fixed costs: on the one hand, the externalities linked to learning-by-doing (Arrow, 1962) or learning-by-using (von Hippel, 1988) are raised in these activities which often take shape in collective contexts; on the other hand, knowledge production activities require the construction of common languages or codebooks (Cowan and Foray, 1997) whose hierarchy is unable to bear all the fixed costs.

It is particularly these new failures in the hierarchy, linked to the knowledge-based economy that makes, as Foss (2001, p. 10) recently pointed out, it becomes urgent to think of new forms of intra-coordination. -organizational. To report on this new organizational dynamic, several "alternative currents" of research thus start from this knowledge-based vision to carry the analysis of organizations from a resource allocation perspective to a creation perspective. resources. Learning and knowledge production is now of prime importance and the firm is increasingly understood as a "knowledge processor" rather than an "information processor" (Fransman, 1994; Cohendet and Llerena, 1999; Amin and Cohendet, 2004).

According to Fransman (1994), if transactional theory, like the other contractual theories of the firm, fails to take into account the phenomena of knowledge creation, it is because the firm is conceived there as a simple "information processor" Which offers an answer to the shortcomings of the market when the latter is not able to process the information itself or when this processing is very expensive. Fransman (1994) opposes this new vision developed recently by a whole group to the vision of the firm as an “information processor”, where the cognitive dimension of agents, their ability to process knowledge or their learning capacity are relegated to the background. streams of very varied origins (strategy, evolutionary theory, industrial history, organizational sciences) which converge to offer a vision of the firm as a "knowledge processor" which favors the acquisition, production, and distribution of knowledge essential to the maintenance of skills. Organizational learning is therefore at the very heart of the basic skills of the organization.

2.2 THE LIMITS OF NEW THEORIES OF KNOWLEDGE MANAGEMENT

Recent work in terms of knowledge management has marked serious advances in the understanding of knowledge management methods. Thus, in contrast to transactional analysis which rejects the problem of organizational knowledge (and productive knowledge more generally) in the background, new theories of knowledge management place knowledge as the most important strategic resource for the firm and its main capacity to produce a competitive advantage (Prahalad and Hamel, 1990; Kogut and Zander, 1992; Teece and Pisano, 1994; Nonaka and Takeushi, 1995; Ancori et al, 2000). In this new configuration, and like Fransman et al. (1995) describe the firm as organizational entities that create knowledge.

However, many works emphasize at the same time the contextual character and specific to the original conditions of the accumulation, generation, and validation of productive knowledge. In other words, this knowledge is embedded in a variety of learning processes and organizational structures specific to individuals and firms. Productive knowledge appears in this vision as a fragmented resource dispersed in a myriad of idiosyncratic contexts of application and generation. Each context is characterized by different levels of complementarities (Gibbons et al, 1994). In line with the distinctions (which have become customary today) between information and knowledge (Machlup, 1980; Nelson and Winter, 1982; Dosi, 1988), between tacit knowledge and codified

knowledge (Polanyi, 1967; Nelson and Winter, 1982, Ancori et al, 2000), these new approaches also take into account the dimension of embedding knowledge in specific interactions and networks of personal relationships (Nahapiet and Ghosal, 1998; Granovetter, 2000).

New knowledge management theories have great difficulty in grasping this situated dimension and remain limited to an "epistemology of possession" in the sense of Cook and Brown (1999): productive organizational knowledge is assumed to be owned by agents.

3. LIMITS OF TRADITIONAL ORGANIZATIONAL METHODS OF COORDINATING PRODUCTIVE KNOWLEDGE

3.1 THE (HIDDEN) IMPORTANCE OF PRACTICE

In the standard contractual representation of the firm, knowledge is implicitly assumed to be "possessed" by the agents. The formation of new knowledge as well as the exchange and exploitation of existing knowledge is seen as a process triggered by learning mechanisms distinct from the forms of knowledge possessed. This vision of knowledge is necessarily reductive: it only considers the objective part of knowledge which eliminates the subjective and contextual contingencies and the knowledge that action provides (through experience). Now, as Hayek has admirably shown, it is these idiosyncrasies and particularisms that are most important in economic sequences.

The separation between knowledge and practice thus represents a false dichotomy in the contractual theories of the firm. The process that produces knowledge in the organization cannot be separated from the practice and the contexts in which this knowledge is formed, acquired, and appropriate. In other words, knowledge cannot be reduced to a "stock" which can be transferred from one context to another. Its use requires an effort of interpretation and translation so as to always update and recreate it in relation to each new context (Tsoukas, 1996).

The standard vision of coordination can be adapted to knowledge-reduced-to-information (Amin and Cohendet, 2004). Knowledge is not just an aggregation of information. It is more of an information system embedded in a context (Granovetter, 1985) and subject to individual or organizational processes that give it meaning (Weick, 1995) by allowing the interpretation of new and existing information on an individual level. or organizational to develop new knowledge (Daft and Weick, 1984). If the information has a mainly quantitative dimension, knowledge is purely qualitative. Thus, rich knowledge can be created from very fragmented information. Conversely, a very large amount of information can produce insignificant knowledge.

This distinction has very important social and organizational implications: while the first type of knowledge needs to be collected and integrated, the second type needs to be disseminated. Cook and Brown (1999) have designated the approach that focuses on the first type of knowledge as a "possession epistemology", while the second type of knowledge corresponds to a "practice epistemology".

The intuitions of many economists (for example, Friedrich Hayek, Edith Penrose) seem to be verified in an economy based on knowledge and practice can now be posted as a central dimension in the process of coordination of productive knowledge. To better understand this dynamic and evolving nature of knowledge, we will refer here to the founding work of the theory of practice in Lev Vygotsky and Pierre Bourdieu.

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3.2 TEACHINGS OF THEORY OF PRACTICE

Lev Vygotsky is one of the authors who most deeply rooted their approach to knowledge and learning in the epistemology of practice: knowledge emerges in and through practice: "[T] he primary form of intellectual activity is the active, practical thinking, directed towards reality and representing one of the fundamental forms of adaptation to new conditions, to changing situations in the external environment" (Vygotsky, 1997, p. 84). Knowledge is thus built according to Vygotsky first in action before being internalized. It is knowledge-in-action. This testifies to the primacy of the epistemology of practice over the epistemology of possession: we do things (opus operatum) before knowing how to do them (modus operandi). This discrepancy between what the agents know and what they can do, that is to say, the difference between the internalized performance of the agents and their performance in an action situation, results in a distance, always emerging, between what the agents are and what they want to be.

This is what Vygotsky (1997) defines as a "zone of proximal development", where he says resides the best learning opportunities. In other words, the learning interaction is most active when the learner is cognitively ready, that is to say, located in a zone of potential development. This vision suggests that learning, situated and contingent, cannot be decreed ex-ante. It is interaction and cooperation that promote the updating and building of knowledge.

Pierre Bourdieu's vision is very similar to that of Lev Vygotsky. Also in Bourdieu, we find the idea that economic activity must be understood not only as an opus operatum, that is to say, a finished product, an "objectified product", but also and above all as a modus operandi, a mode of production, "an incorporated product of historical practice, structures and habits" (Bourdieu, 1980, p. 88). Knowledge thus appears as a movement, a flow or a grammar which guides the practice of each agent: "Reflective explanation converts a practical succession into a represented succession, an action-oriented in relation to space objectively constituted as a structure of requirements (things "to do") in reversible operation, performed in a continuous and homogeneous space.

This inevitable transformation is inscribed in the fact that the agents cannot adequately master the modus operandi which allows them to generate correctly formed ritual practices except by making it function practically, in the situation, and by reference to practical functions. The one who has a practical mastery, an art, whatever it is, is capable of implementing, in the act, this provision which appears to him only in act, in relation to a situation (he will be able to redo, as many times as the situation requires, the feint which imposes itself on him as the only one to do); he is no better placed to perceive and bring to the order of discourse what really regulates his practice than the observer who has on him the advantage of being able to apprehend the action from outside, as an object, and above all to be able to totalize the successive achievements of the habitus (without necessarily having the practical mastery which is at the principle of these achievements and the adequate theory of this mastery) "(Bourdieu, 1980, p. 152). The idea of the attention economy, through the activation of routine action, is here a central idea: the agent can only adequately master the modus operandi by internalizing part of this operating mode and by making it spontaneous, a habitus. This interiorization, says Bourdieu again, is necessarily embedded in a situation: only a stimulus emanating from this situation can trigger the spontaneous action that is necessary (or the feint in Bourdieusian terms): "It is acts that a habitus will never produce if it does not meet the situation in which it could actualize its potentialities: we know for example that the borderline situations of times of crisis give to some the opportunity to reveal potentialities unknown to

themselves and others (Bourdieu, 1980, p. 154f). The idea of the operating mode returns to the foundation of practice compared to a cognitive effort, therefore of cognitive capacity, of attention which must be saved, less because of a general principle of rational calculation applicable by the repetitiveness of the work only because of the "logic of the practice" (Ibid., p. 154).

By linking knowledge to practice, This pragmatic approach in Lev Vygotsky and Pierre Bourdieu allows us to identify three main characteristics of productive knowledge within organizations: (i) this knowledge is mediated: manifested in systems of technology, of collaboration and control; (ii) they are located: localizing in a specific time and space in particular contexts; and (iii) they are temporary: constantly (re) constructed and (re) developed.

An epistemology of practice, still unexplored in economics, thus seems more capable of restoring the complex models of economic coordination of knowledge within organizations. This framework clearly suggests that the appropriate unit for the analysis of knowledge formation embedded in practice should be neither individuals nor organizations, but rather distributed activity systems, such as communities.

4. LIMITS OF TRADITIONAL ORGANIZATIONAL METHODS OF COORDINATING PRODUCTIVE KNOWLEDGE

4.1 NEW APPROACHES OF COMMUNITIES OF PRACTICE

Many seminal contributions developed this approach in terms of communities in the 1990s in line with the sociological theses of the practice (Lave and Wenger, 1991; Brown and Duguid, 1991; Wenger, 1998). This work has particularly highlighted the fact that a growing part of learning and knowledge creation is the result of informal collective actions. As a result, not only does learning always have a social dimension but, moreover, it manifests itself mainly in the social interactions of agents engaged in common practice. Any action must, therefore, be understood according to its context. Knowledge is no longer seen as the property of individual agents, but as distributed and embedded across social systems, taking place primarily at the intermediate organizational scale of "Communities of practice".

A central economic feature of communities of practice is that they are based on a principle of voluntary cooperation (trust not calculated strategically, intrinsic motivation, etc.) and are made up of agents who interact through a non-hierarchical communication architecture. They are thus able to assume the “sunk costs” relating to the knowledge generation and/or accumulation processes. These are, for example, the costs of progressive construction of languages and models of action or interpretation necessary for the implementation of new knowledge and which are not supported by the traditional mechanisms of the hierarchy.

Also, we suggest in this contribution that communities of practice can compensate for the failings of the hierarchy in firms that face the need to innovate and to continuously produce or assimilate new knowledge.

Through regular interactions - between members of a community - constituting the infrastructure that supports situated learning, communities become repositories of knowledge that is embedded in their daily practices and habits. One of the determinants of the accumulation of knowledge within the community is the mode of learning adopted by a community (for example, learning by circulating "best practices"). Also, in most cases, knowledge is circulated using local

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language (code) specific to the community. As Wenger (1998) points out, a community based on interaction and participation constitutes a "locally negotiated jurisdictional regime".

More precisely, over time, engagement within a common practice creates "Directories" shared by community members: routines, jargon, procedures, stories, gestures, symbols, etc., but also physical media, such as prototypes or models. These shared repertoires, created (or adopted) by the community during its existence, are gradually becoming an integral part of its practice. They should not be understood as consensual bases, but rather as resources that can be mobilized for negotiation of meaning in situations of interaction. Organizational learning is not natural: it needs the tensions created or injected to trigger. Collective learning in this vision occurs in organizational practices while agents negotiate or renegotiate common repertoires or common knowledge bases. It is thus widely located. Knowledge is generated and used within communities through learning that can only be specific to the situation and to the community of actors sharing its management. The variety of communities within an organization thus represents a variety of potential organizational trajectories. These communities can thus encapsulate options: the organization can choose to go to latent common reference points in certain communities.

4.2 A CONCEPTUALIZATION OF THE INTRA-ORGANIZATIONAL COORDINATION OF PRODUCTIVE KNOWLEDGE: LINKING THE THEORY OF THE FIRM TO THE THEORY OF PRACTICE

The analysis in terms of communities opens wide perspectives to link the theory of the firm to the theory of practice. One of the advantages of this analysis is that, in a given community, learning merges with practice due to the nature of the practice itself. The introduction of the community as a unit of analysis thus makes it possible to remedy the classic false separation in economics between knowledge and practice. The process that produces knowledge in the organization cannot be dissociated from the practice and the contexts in which this knowledge is formed, acquired, adjusted, used, shared, updated, regenerated, and appropriate. And adopting the idea that knowledge creation takes place mainly in action contexts, and that action is always collective, consideration of the intermediate level of the communities is therefore necessary to focus on learning in processes of 'action. The community must, therefore, conceived first as a node where information exchanges and interpretations intersect, and then as a chain through which information is conveyed within the organizational boundaries of the firm.

In this way, a major advantage of the community over conventional organizational modes of coordination is that, insofar as the implementation of knowledge is based on the existence of a language and shared representations, the accumulation and knowledge processing takes place naturally within a given community, without an absolute need to resort to powerful incentive mechanisms. The community is a place of trust for each of its members.

Thus, in unforeseen situations, commitments will not be guided (as a priority) by the spirit of contracts but by respect for the social standards specific to the community. The validation of knowledge is done at first analysis within a given community. Likewise, the interpretation of knowledge provided from outside (notably by the hierarchy) is examined, criticized, and restated (sometimes giving rise to creative adaptations) within communities. On the other hand, the retention of routines, their power of replication, and their continuous improvement are all the more likely to be realized if they operate within given communities. The development of diverse communities corresponds in this way to a gradual division of knowledge creation tasks, each community

specializing in a patch of new knowledge. Only the community is capable of keeping knowledge alive so that it preserves the tacit aspect of knowledge that formal systems of governance cannot capture. The community thus bears the fixed cost of the progressive construction of languages and models of action and interpretation. By having a common practice long enough, agents develop in a community shared understandings, a shared vision of the world, etc. An organization considered to be a community of communities will, therefore, be able to act on distributed knowledge, to a large extent held by individual agents. Communities also help stabilize individual commitments in an uncertain universe. Individuals remain attentive to the specificities of situations and can, therefore, update the forms of their cooperative engagement. The construction of meaning being essentially a procedural approach (Lave and Wenger, 1991), communities are thus providers of meaning (Cyert and March 1963; Daft and Weick, 1984) and collective beliefs in agents and therefore play a central role in coordination in the organization. The community framework provides the context in which collective beliefs and the representations structuring individual choice and collective action are constructed.

5. CONCLUSION

The main purpose of this contribution is to (re)think about the inadequacies of the firm's contractual approaches to the advent of a knowledge-based economy, as well as that of recent knowledge management work. It is about being able to account for a new competition regime where productive knowledge is becoming more and more dispersed within intra-organizational and inter-organizational knowledge networks around "best practices" on the market. In this sense, we have particularly developed the interest of not being limited to an epistemology of possession of knowledge and of fertilizing it with a vision where knowledge cannot be grasped or conceived outside of the practices which condition and generate it. The community of practice, therefore, seems to be the optimal organizational field where the individual and the group learn best. In other words, it represents an organizational unit that allows better intra-organizational coordination of productive knowledge. We have put forward a pragmatic vision of learning and coordinating organizational knowledge which is concerned with the processes and contexts of knowledge creation and dissemination and perceives organizational performance through observation of practices in work situations. Knowledge is defined as a process of social achievement constituted and reconstituted every day and at any time through practice: it cannot, therefore, be stable or permanent but subject to continual and dynamic change. Communities of practice are therefore an ideal place where the members of an organization are most successful in learning, since it is no longer possible to dissociate knowledge of the place, context or situation from which it emerges, or the practice that generates it and of which it is a fully integrated part. Activity, which is the field of practice, is the source from which organizational skills emerge.

6. AVAILABILITY OF DATA AND MATERIAL

Data can be made available by contacting the corresponding author.

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