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INTRODUCTION

Many researchers believe that knowledge-based entrepreneurial firms struggle to survive because in these specific activities they must be simultaneously entrepreneurial on several dimensions. Indeed, they must be entrepreneurial in the sense that they create a new product or a new service, but they must also be innovative in their business model and in the marketing strategy employed. Besides, they have to show some Schumpeterian entrepreneurial skills to bind those elements together. Achieving simultaneously a good level of efficiency in all those entrepreneurial domains is difficult, therefore many start-up firms fail in their early years (Burger-Helmchen, 2008; Maurer, Ebers, 2006; Leiblein, 2007; Witt, Zellner, 2007).

The present work aims to answer the following question: How should a creative firm which relies on a user community to achieve sufficient efficiency in some of the entrepreneurial dimensions, manage the division of labour and the division of knowledge? Following Alvarez and Barney (2007) the study focuses on the debate as to whether entrepreneurial opportunities exist by themselves or whether they are created by the actions of entrepreneurs, in the present case helped by the action of the users of the existing product or the product under development. Usually two alternative theories of entrepreneurial opportunity genesis compete, the discovery theory and the creation theory.

This research work is articulated around a longitudinal case study of a cell-phone video-game firm which relies on users to test and improve their games. This study shows the changing role of users in that specific sector of activity and allows us to state the following point of view: the entrepreneurial opportunity creation can have several sources. We identify two, one corresponding to the action of the firm's engineers, the other to the action of the users themselves slowly becoming entrepreneurs. In this view our approach follows the work of Shah and Tripsas (2007) and their model of how entrepreneurs and sometimes users create, evaluate, share, and commercialize their ideas. We emphasize the emergent and collective nature of the entrepreneurial process when users are involved. Shah and Tripsas (2007) described the users as sometimes "accidental" entrepreneurs who come upon an idea through their own use and then share it with others. In this case study we reject this approach, for us the user's ideas are in most cases elicited by the firm through huge efforts.

Previous work on this creative start-up (Burger-Helmchen, Guittard, 2008) opens up the question of how a private firm should manage the integration of the different types of entrepreneurial opportunity creation. Therefore we investigate the governance approach of division of labour and division of knowledge so as to propose an integrated perspective of management of this type of entrepreneurial innovation. In this case the core competence of the firm becomes its capacity to integrate different work done by user entrepreneurs. Consequently, the managers of the integration process are key elements because they ease the integration of the different bricks of the entrepreneurs' work and, somehow by their action they develop the firm's creative strategy.

These managers also play a key role to ensure the interface between the firm and the user community. Indeed, if ideas and knowledge are held by user entrepreneurs, who wish to turn their ideas into action, the role of the manager is then to organize that specific knowledge (Becker *et al.*, 2007, Cohendet *et al.*, 2000; Teece, 2007). In this respect the social structure of the firm and the place of the manager in this structure form together a critical perspective for the allocation of the inventive and integrative resources (Ethiraj, 2007; Kleinbaum, Tushman, 2007). However, little empirical work has examined how such communities help SMEs to manage production and creativity. In such modern production communities contributors, independently of their employment context, voluntarily collaborate to create goods or services for either public or private benefit (von Hipper and von Krogh, 2003). Within recent years, online production communities have begun to produce creative information goods such as scientific knowledge, art and software.

The paper is structured as follows. First we present a review of the works on division of knowledge and division of labour and how they are linked to the dynamics of innovation in entrepreneurial firms. Then we present a longitudinal study on a small video game company that tries to produce creative products. In a third section we sketch some governance implications for knowledge-based small enterprises that rely on user communities to achieve sufficient creativity. The final point of this work proposes in conclusion a framework for further research on the division of labour and knowledge for creative firms.

DIVISION OF LABOUR AND DIVISION OF KNOWLEDGE [1]

Since several years the vision of a firm as being simultaneously a processor of information and a processor of knowledge exists. Considering the firm as "a processor of knowledge" (Fransman, 1994) rather than a "processor of information" determines a quite radical shift of perspective. In this latter case, the behaviour of the firm can be understood as an optimal reaction to the information which comes from the environment; in principle the behaviour of a rational information processing firm can be fully described as a response to environmental signals. In the former case, we are in a world of imperfect environmental matching (Cohen, 1991), where the behaviour of the firm is not fully and optimally determined by environmental signals: the same signals may give rise to very different patterns of action depending on the knowledge embedded in the firm, its collection of routines, rules and practices. Informational problems traditionally at the core of the economic analysis of the firm, such as information overload, loss of control, etc. can be included, and considered from different perspectives. These extend to broader cognitive problems of competence traps, relations between individual and organisational learning, dilemmas between exploitation of available knowledge and exploration of new concepts (March, 1991; Choo, Bontis, 2002).

This distinction has implications on all activities of the firm: its productive activities, the human resource management activity and of course the creative activity of the firm. The knowledge-based approach emphasises that in a world where agents differ in their perceptions of the environment, and where communication, acquisition of information and computation are limited and costly, co-ordination can only be achieved by means of the definition

1. More on the topic in Becker, Cohendet and Llerena (2007); Cohendet and Llerena (forthcoming, 2009)

of a common set of rules, codes and languages which are well understood and shared by all the members of the organisation involved in a certain interaction. In this case communities, routines, rules, procedures, standards, etc. become central in the conceptual framework, and also incentive schemes and information sharing rules have to be analysed as devices for the co-ordination of distributed pieces of knowledge and distributed learning processes.

This stream of research has led several scholars to distinguish between the role of the manager and that of the entrepreneur because it seems that a single person could not efficiently manage the information flows and the knowledge base of the firm. The former role requires hierarchical skills, efficient for standard production, but not for creativity outcomes; the latter needs an apparently looser governance structure, beneficial for the creative workers but possibly counterproductive for a more standard labour force. The distinction between standard managers and entrepreneurs has been analyzed in many studies, especially with the recent upsurge of interest in entrepreneurial firms for economic and political reasons (Busenitz, Barney, 1997; Hsieh *et al.*, 2007).

That entrepreneurs are responsible for novelty is a very common argument since Schumpeter's definition attempt, according to which entrepreneurs are those carrying out new combinations. Many other distinguishing features have been added since (uncertainty bearer, disequilibrium-equilibrium maker… see Casson, 2005, 2007). In a knowledge-based framework the characteristics of the entrepreneurial capabilities can be stated as (i) a specific and dynamic "asset" with the ability to manage strategically the adaptation, the integration and the re-configuration of internal and external organizational structure of the firm and (ii) an active interface between the internal and external environments of the firm, and as (iii) responsible for the vision or the business conception, which is a primary entrepreneurial input (Witt, 1998, p.162). All those elements will impact the organization of the firm itself.

Knowledge worker

The *knowledge-based entrepreneur* is the upper layer of the *mental labour* in Babbage terms, i.e. framing the interpretation and the division of knowledge / labour of the innovative process. It is a specific role, related to the organisation and management of the collective cognitive processes in emergent and evolving firms and has to be contrasted with a more Smithian view. We develop briefly the Smithian and the Babbagian views hereafter.

For Adam Smith the division of labour leads to the division of knowledge. The development of skills is more a consequence than a cause of the division

of labour, in particular through learning by performing tasks. The division of labour entails a process of learning by doing, which contributes to increasing skills and expertise and thus to enhancing the accumulation of specialized knowledge (Loasby, 1998; Brown, Duguid, 1998). The opposite position is taken by Babbage; for him the division of knowledge drives the division of labour: "the division of labour must itself be founded on the division of skills" (Marshall, 1961, p. 265 quoted in Hodgson, 1993, p. 412).

In the Smithean view a progressive specialisation of work induces progressive specialised knowledge through learning by doing. This occurs under the following conditions: the pre-existing division of labour, to be coordinated, to produce given (or even changing) artefacts. As a consequence the firm organization follows a functional division of labour (Chandler). Routines are then the "memory" of organisations, truces to handle divergence of interests and conflicts, while the focus is on the 'activities' and their coordination. The implications of the hypothesis "the division of labour 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, acquisitions, of a given firm mostly rely on strategic considerations related to the processing of information, and to the level of transaction costs. In such a context it becomes extremely difficult to explain the functioning of the creative firm in the perspective defined by Nonaka and Takeuchi (1995, p .56): "When organizations innovate, they do not simply process information from outside in, in order to solve existing problems and adapt to a changing environment. They actually create new knowledge and information, from the inside out, in order to redefine both problems and solutions and in the process to re-create their environment".

In the Babbagian view the differences in skills and "mental labour" precede the division of labour and are also subject to learning and specialisation. Babbage gives the following example "the master manufacturer, by dividing the work to be executed into different processes, each requiring different degrees of skill or of force, can purchase exactly that precise quantity of both which is necessary for each process..." (Babbage, 1832, p. 175). This suggests that one can unbundle the labour skills and pay only for the exact quantity the firm needs to produce. Many conditions must be fulfilled for such a mechanism to operate. The main conditions are that there is an individual with all the necessary competences who knows how much of each type of labour must be acquired and that the required variety of labour also exists. As a consequence the division of knowledge does not necessarily match the division of labour, and the organisation/coordination of dispersed knowledge does not necessarily overlap with the organisation/coordination

of activities. In this approach the focus is more on the coordination of learning processes than of activities, the Babbagian view may be interesting in an economy driven by the evolution of knowledge, and the existence of dynamic capabilities, creation of new options, coping with high uncertainty: in other words the Babbagian approach to creative industry is better, with a relatively rapid pace of innovation, and the Smithian approach corresponds rather to the production of standardised goods.

This approach of division of labour and division of knowledge, and particularly the non-overlap of knowledge and activities, is a predominant reality for creative firms organized in a network configuration with other firms, or knowledge/labour suppliers. Of course, this non-overlapping induces many governance and managerial challenges.

To summarize and schematise this presentation we use the following notation that we also employ in the section on governance of the divided labour and knowledge: we note K the sum of knowledge possessed by the decision-makers in the firm (whether they are entrepreneurs or managers) and L the sum of the different knowledge possessed by each employee performing a specific Labour task. In a Smithian perspective before the division of labour takes place $K = L$. All the employees perform all the tasks necessary to produce and they are well known by the decision-makers. After the division of labour, each employee develops specific, specialised knowledge to perform the task he is in charge of with the highest efficiency. Therefore, after some time, the different individuals have developed and accumulated specific knowledge. The tasks they perform may be the same, but the practical knowledge they have is enhanced, the equality $K = L$ becomes $K < L$. If the firm continues to produce the same type of items this difference is not a problem. But if the firm wishes to create a new product, this difference can lead to the rejection of the novelty. Rejection if the novelty comes from the employees (because K, the knowledge of the decision-maker, does not encompass the knowledge of the employee L, thus the decision-maker may not understand the proposal), but also rejection if the novelty comes from the decision-makers because the proposal may be obsolete and incompatible with the comprehension of the employees. Such problems have notably been analysed in a managerial perspective by Conner and Prahalad (1996) incorporating the relation between the firm and the market.

In a Babbagian perspective the picture is different. The decision-maker's knowledge encompasses completely the knowledge of the labour force at the beginning, almost by definition because the decision-maker has to allocate the adequate employees to the labour task corresponding to their abilities. Therefore we can write $K > L$ (or at least $K = L$). In this case if the firm wishes to create a new product, the difficulties are less important than in the

Smithian approach, and of a different nature. We develop this point in the governance-oriented section of this work.

In the following section we expose a longitudinal study of an entrepreneurial video game company which presents such features as an illustration, but also as an insightful study basis.

CASE STUDY: A CREATIVE ENTREPRENEURIAL FIRM

The firm we selected is a small enterprise in the video game industry for handheld phones. This creative industry offers many entrepreneurial opportunities (Burger, Guittard, 2008). In the following we use interviews, ethnographic and archival data to explore how this small creative firm coped with labour and knowledge division over a 4 year period, and how different conceptions of leadership in organisation emerged over time. Such an inductive approach is well suited for studying emergent and imperfect phenomena and contributes to theory building (Strauss, Corbin, 1990; Edmondson, McManus, 2006). For grasping the evolution of the governance of this firm we employ the governance appraisal methodology used by O'Mahony and Ferraro (2007). These authors distinguish four governance phases that we can also reinterpret as knowledge division and labour division phases (Table 1 lists the links between those different phases in their approach and our approach). The table is discussed just after the firm presentation.

Description of the firm

The firm we study is a creative start-up. As noted by Gaujard (2008) defining a high-tech start-up is not a trivial task. We retain the following definition of a high-tech firm: "*a firm that uses or invests in rapidly emerging or evolving technology as a key part of its product development, production or marketing strategy*" (Park, 2005, pp. 740-741). The label 'creative start-up' is used to distinguish our work from those more interested in technical entrepreneurship (Oakey, 2003). The creative activity of the firm appears as a subset of innovative firms (Kratzer *et al.*, 2006) as a measure of the efficiency of the innovative process. The more creative the firm, the more radical the innovations show themselves. This creativity manifests continuously during the longitudinal study but, as we will see, not on the same dimension studied (product creativity, organizational creativity...).

The firm was created in Strasbourg, France, in 2004 by three associates. The objective of the firm was to create high quality games for mobile

phones. In the following we describe the firm under the name F. Two of the associates came from the regular video game industry (PC games) and one from another multimedia; he was involved in web-site creation. We met the firm for the first time in late 2004, some months after it had started, and since then we have carried out interviews with the employees and users for several projects on a regular basis which provided us with a good idea of the evolution of the firm. We had also access to a certain amount of information coming, among other sources, from reports, press releases and advertising articles for their products; which allowed us to determine the innovative nature of some games. Because these data can have different origins (internal or external to the firm), we checked their mutual coherence. For the present work we summarize the stages and provide links to the community approach.

Their first game was an original in-house production, commercialized at the end of 2004. Although the game was quite good for the standards of the time, the firm encountered difficulties in marketing the game, but it was noticed by a major game publisher. The game publisher hired the firm for producing a mobile phone game for a franchise he possessed and exploited already for PC and console productions. This was new for the firm, which then decided to produce games for the major publishers that were relatively standard in their concepts, and to produce in parallel its own original games. Therefore we could say that the firm finances its creativity and research by exploiting its competence to produce franchised games for the major game publishers.

The creation of the firm corresponds to one type of entrepreneurship. The three associates at the origin of the firm wished to create their own product and to commercialize it. Therefore they became entrepreneurs and founded their own small enterprise. At the origin of the firm, all founders were themselves involved in the production of games, doing programming, level design and testing. They still have good contact with other programmers that they have met in their previous employments. They form with this people a community of practice.

After being founded the firm has grown in size since its origins, to reach today in 2008 25 persons and it has produced 15 games in less than four years. Not only has the quantity of people involved in the firm increased, but also their qualifications and missions. For example in 2005 the firm hired a person who had several tasks to fulfil, to organize the beta test with users, to market the original games they produced and to handle the relations with the game publishers. The organization of the beta test consisted of creating a group of users, who brought their own phones for doing the test. The test session in the first years of existence of the firm consisted then in downloading the game on to their phones, and making them play, first in a

free manner, then asking them to accomplish a certain sequence of moves. If the game did not crash or show problems, it was deemed acceptable for that specific phone.

In case of bug reports the user was first asked to change some options of the game in a user friendly menu, or to modify some elements of the phone (update the firmware), to see if it solved the problem. If the problem was not solved the organiser of the test session noted all the characteristics of the behaviour leading to the bug. He summarized then all the bugs and informed the programmer of what the different users had found. Not only did the users report the bugs and errors to the integrator but some of them even provided a solution. Those users were usually students in the field of computer technology who were willing to show their knowledge and learn some tricks of the business. The users we have observed helping the firm and other users during the tests are also curious and willing to test the products some other producers are developing. We found here a link to another group outside of the firm, the user community.

The users were also asked to express any suggestion for improvement, or modification they found helpful to enhance the quality of the game but this was initially of minor importance for the firm. One of the main problems in this activity is the huge number of versions of the same game that must be published. There are more than 300 different versions of mobile phones for which the game must work in order to be distributed. Therefore the founders began to develop a homemade tool to adapt their product to all mobile phones more rapidly and efficiently. The tool has been in use since mid-2005. This aspect dramatically changed the relations with the users. Consequently the need for users having different types of phone to track program bugs disappeared. However the firm did not abandon its relations with users and organized test sessions around the gameplay. Gameplay corresponds in video game terminology to the overall experience of playing the game including the immersion feeling, pleasure and addiction given by the game. The users were asked to list the elements of the game they liked and disliked, what they would like to see changed, and in what way. Quite often the modifications were minor (change in colour, speed, difficulty), and those modifications were neither a new idea nor an innovation. But every now and then, the proposals were more complex, and could necessitate a major program adjustment. The integrator told us that the first time users made such big change proposals he was very confused. It was a test on a game for a major company; he knew that they could not introduce the modifications (although they would have enhanced substantially the fun of the game), both because of time pressure to finish the product, and because the game published had already set the specifications.

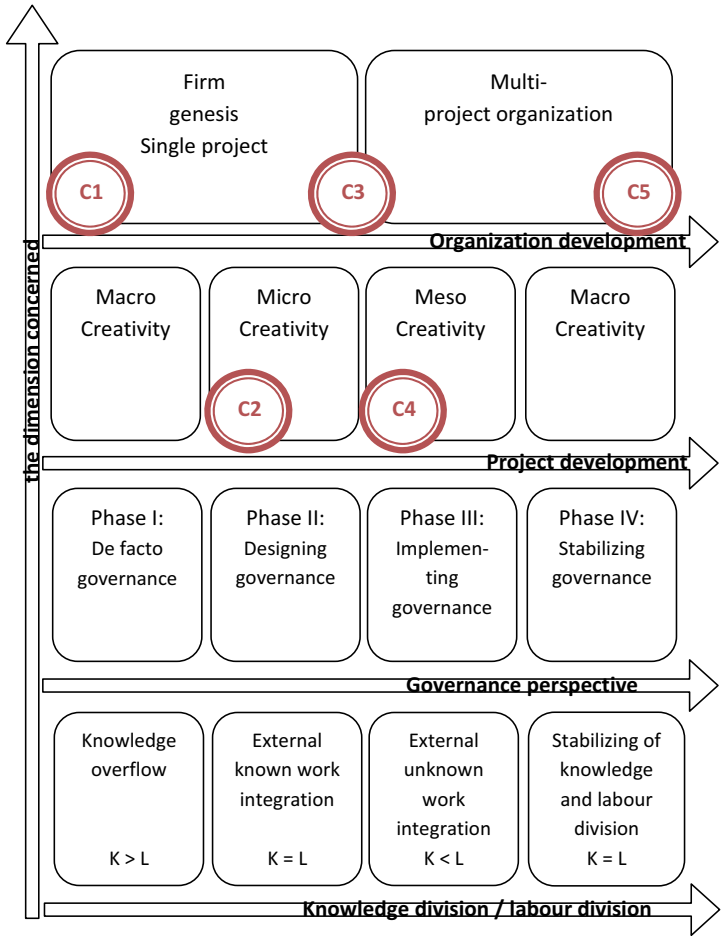
However, the ideas were not completely discarded but, where possible, integrated in the next game created. This corresponds to a third type of community / firm relation with this time a more important role on the product innovation side. What the user community tries to do is to influence the development of the product and shape the product in conformity with their taste, but also to anticipate the future taste of other players. These modifications required a major change of the interface and corresponding programming time. Also, when the game tested was not an original game of the firm, but one they had to make to order for a major game publisher, significant modifications from the original project were not possible. Therefore it was not possible to implement these ideas in the current product, but the team managers were careful to implement them in the next game they developed, either an original game, or a sequel of a game in the project development phase before it received the approval of a major game publisher.

That innovations and improvements occur during the development phase is nothing new in the video game industry. Cohendet and Simon (2007) report two types of creativity in the development process of a video game, the micro and the macro-creativity. The micro-creativity corresponds to what emerges during the daily activity of the programmers, macro-creativity corresponds to what is created and decided once and for all at the beginning of the project by the team manager. In our example, the important, innovative ideas of the users are incorporated during the macro-creative phase. Also a distinction can be made between the creative improvements coming from within the firm and those coming from users outside the firm. We circumscribe the firm's creativity at the beginning of the project as macro-creativity, and, because the creativity coming from the users is developed after the programmers did their work (micro) and it is integrated not in the current game, but in the next generation of products (macro), we label it meso-creativity. To exploit this type of creativity, the firm installed at the beginning of 2008 a dedicated web site to manage its relations with the different user/ innovator/programmer communities. Such a representation has implication for the knowledge / labour division as we will see later.

We can summarize the different types of community/ firm relations we observed in the case study with knowledge/labour division and governance perspective. In Figure 1 the vertical axis distinguishes different dimensions involved. With respect to our case study we retain three dimensions (i) the organization development, (ii) the different project developments, and (iii) the development of the governance. The horizontal axes correspond to the development of each dimension through time. On this representation, each time a different type of community/firm relation is involved we mark it with a circled user sign. This figure will help us better to understand the links

between the governance schemes and the division of labour and division of knowledge.

Figure 1 – Organization, project development, governance and knowledge-labour division dynamics



We start our discussion on the upper left part of Figure 1 with the organizational development of the firm. Two major phases can be identified: the launching of the firm and its subsequent development. The launching of the firm corresponds to the moment when 3 individuals became founders of the firm to exploit a product they designed for their own pleasure and that they expected would please other players (mark C1 for community stand one). They worked as a community of practice, applying the techniques they learned and shared with other individuals in other firms. The second phase

of the organizational development corresponds to the situation where the firm engaged in the development of several projects simultaneously and developed its own tool for adapting all the products to the large number of phone devices, this corresponds to mark C3.

The next dimension on the figure corresponds to the project development, when product innovation occurs. The user community helps the firm in two ways along this dimension. First by seeking errors in the program, possible bugs that appear to be dependent on the phone device employed. This corresponds to the C2 mark on the figure. Secondly, by proposing substantial modifications, creative ideas, that can result in an innovative new product for the firm. This activity refers to what we called meso-creativity, when the ideas of the user community are implemented in subsequent generations of products. This corresponds to the C4 mark on the figure.

The final dimension we observed corresponds to the stabilizing of the organization around the different communities. We mark this C5. The relations between the different communities and the firm are institutionalised, in particular through a dedicated web site.

Governance of divided labour and divided knowledge

In this section we present the results of our case study analysis and qualitative data to show how the firm governed the knowledge division and labour division interactions with the different communities. As mentioned we used the four distinct phase process of O'Mahony and Ferraro (2007) and adapted it to our situation. These four general phases appear also in our case study, but not with the same duration as in their work. We also sketch on these phases a parallel with knowledge division and labour division (see Table 1).

Phase I: De facto governance with an initial overflow of knowledge

This phase (C1 on Figure 1) corresponds to the launching of the firm. We found that in the first months the firm operated reasonably well without any formal means of representing the governance. This is easy to understand; there was only one project undertaken. The founders knew each other very well; each had a specific task to do. The governance was *de facto*.

From a community perspective, each founder was involved in a community due to his previous work. Therefore it was a "known" community relation with standardised interaction. From a knowledge / labour division point of view, the three associates knew all the steps of the game creation and there was no technical problem. They divided the labour in an efficient manner between them. We can assume that at the beginning there was a good match between the division of knowledge and the division of labour (assuming that

each of the associates had a good overview, and each performed the task which he knew best). In fact, at this stage each founder had the necessary knowledge to create the game entirely due to his past experience and was perfectly accustomed to community relations. Therefore we mention in Table 1 that the initial knowledge base overflows the labour qualification.

Phase II: Designing governance, and knowledge / labour division equilibrium

This phase (C2 and C3 on Figure 1) corresponds to the passage from a single project to a multi-project firm, the growth of employment, to relying on users for testing the compatibility and errors in games that led to the creation of a dedicated tool and the end of this phase. From a community perspective a new type of community is involved, with user communities doing the beta test and detecting errors.

From a governance perspective the involvement of a new community and the increase in staff created the need to implement some rules to manage the information flow (who may say what), and of course the increase in the number of employees corresponds also to an increase in specialisation in the tasks performed, therefore some organization schemes had also to be defined. From a knowledge / labour point of view the firm used the communities to do routinized work and liberate time for the staff members. Therefore the labour division was encompassed in the knowledge base of the firm. But as external work became more important, and more skilled users participated in the community, the knowledge division ability became balanced with the labour division. By balanced we mean that the knowledge division and the labour division were adequately matched; this became possible by extending the knowledge community outside the firm.

Phase III: Implementing governance and creative work outsourcing communities

This phase (C3 on Figure 1) corresponds to the use of an in-house program for technological specification beta testing instead of a user community. Communities were now relevant for doing more evaluation testing (game play) and for participating in the creation of new designs and diffusion of ideas.

From a community perspective this corresponded to an enhancement of their importance, in a qualitative sense. From a governance perspective the rules needed to be enforced as well as the integration mechanism of the different information flows. The need to coordinate interdependent member activities and integrate member contributions in a production context was likely to exacerbate the need for a shared basis of authority. The firm tried to enhance the existing rules, or to adapt them. It rapidly became clear that the

firm could not impose its rules, only give a broad direction. The firm needed also to develop more democratic relations with the communities. From a knowledge / labour point of view the communities in relation with the firm do, or do by themselves, a creative task, therefore the work done by the communities becomes larger than the initial knowledge base, which is a standard characteristic of creative knowledge communities. The communities began to create by themselves, expanding the tasks performed to a greater extent than was intended by the direction of the firm.

Phase IV: Stabilizing governance and knowledge and labour division

This phase (C5 on Figure 1) corresponds to the creation of a dedicated website for managing all the communities, their interaction, and collecting the information flowing from them. From a community perspective there was no major change in comparison with the previous point.

From a governance perspective to achieve the efficient outcomes some form of rationalization was necessary. How communities resolve this type of conflict is a difficult question, as is the way that a private firm engages in such rationalization between communities to ease the process. What the firm did in this was to set up the dedicated website and appoint a web moderator to supervise the exchanges. From a knowledge / labour point of view the firm is organized so as to routinize the interaction with the creative communities. This better overview and daily monitoring implied that the knowledge base and the labour division extended at the same pace. This is the last phase we observed in mid-2008.

A dual governance structure

Such firm / communities relations are difficult to govern as noted by Shah (2006), but they are of the utmost importance for innovative SMEs. Therefore scholars and practitioners see them as increasingly important to a knowledge-based economy (Amin, Cohendet, 2004). These creative production communities differ from previously studied forms of communities on three points. First, unlike communities of practice or occupational communities, creative production communities are not associated with a single workplace or employer. Secondly, unlike most online communities in which each member creates a piece of work that can be used separately by everybody else, here the creative production must be integrated to obtain a unique product (there is therefore a higher need for coordination mechanisms). Thirdly, the firm must be able to assure the property of the production in the case of opposition with other communities whose efforts are also oriented to the community in a broad sense.

Table 1 – Phase of governance and knowledge/Labour division

Governance Phases (O'Mahony and Ferraro, 2007)	**Example in our case study**	**Knowledge/Labour Phases (Our work)**	**Example in our case study**
Phase I: *De facto governance* Autocratic leadership emerges and is challenged	Governance emerges from the firm's foundation. Each founder knows his responsibility and authority	*Phase I:* *Initial knowledge base overflows labour qualification K > L*	Each founder, by his past experience has good knowledge of all the tasks that must be performed, and could do them by himself.
Phase II: *Designing governance* Formal authority is developed, but limited	Growth of the firm implies some governance rules. Especially on information divulgation.	*Phase II:* *Use of external work for known tasks* *K = L*	The firm uses its community relations for some standard work and to create spare time for the firm's members to do other tasks
Phase III: Implementing governance High influence of the different community leaders	Use of more contributors outside the firm; information and work done by different communities creating the need for clearer governance rules	*Phase III:* *Work outsourcing to communities* *K < L*	The communities working with the firm perform, collectively or separately, a creative task, therefore the labour done is superior to the initial knowledge base
Phase IV: *Stabilizing governance* A shared conception of formal authority emerges	Firm achieves maturity in organization and governance mechanism implementation.	*Phase IV: Stabilizing of knowledge and labour division* *K= L*	The firm is organized so as to routinize the interaction with the creative communities the knowledge overlaps with the labour division

Taken together, these distinctive features suggest that the firm / community relation must be handled in a very specific way. We suggest that the complicated nature of directing individual efforts toward a common goal without the benefits of contractual or hierarchical reinforcement cannot be done by a single person. We found here another possible use of the dual manager-entrepreneur governance structure of the firm (Cohendet, Llerena, 2005). Such a dual governance structure is based on the following hypothesis: The firm manages simultaneously competences/dispersed knowledge and transactions, but it does so according to a lexicographic order (due to limited attention). This order is linked to the Babbagian view presented earlier. The Babbagian view allows us to reinterpret our case study with new considerations about the governance structure.

Two considerations follow:

– First, the firm focuses its limited attention and chooses the priority domain of its competences, focussing on the process of creation of resources. The firm's domain of competences is not considered to be tradable on the market: activities belonging to the domain of competences are 'disconnected' from the transactional make-or-buy trade-off. In this case the domain is first the adaptation to different phone devices, which leads to the creation of an in-house program to obtain better levels of performance than relying on external beta testers. Then, the domain of competences becomes the integration capacity of the different reviews and opinions of the users.

– Second, the firm selects according to transactional criteria the domain of "current activities", the "periphery" (driven by a process of allocation of resources). As a result, for example, the division of knowledge (i.e. the knowledge encapsulated in the firm) may not correspond to the division of labour (i.e. the activities organised within the boundaries of the firm). The former has to deal with the existence and development of dynamic capabilities, the latter with cost efficiency. In our example this periphery evolves from one phase to another.

One of the main consequences of this 'lexicographic' choice (first focussing on competences, then managing the periphery) is in terms of governance structures. The ranking of activities seems to suggest the need for the firm to define at least two distinct governance priorities:

– First, a structure to manage competences in order to align dispersed knowledge and expectations. Within this "core" structure, some contractual schemes may naturally be implemented (e.g. stock options, or specific rewards for inventors within the organisation), although these are not essential when compared with the priority given to the stimulation of collective learning processes. In our case study this structure is the firm as an organization.

– Second, a structure conceived along transaction costs criteria to manage the periphery. Within this second structure of governance, classical contractual schemes are dominant to ensure the information processing that is central to the functioning of the periphery. In our case study this structure is the dedicated web site.

In a dual manager / entrepreneur perspective on this firm / community approach, the task of the entrepreneur would be to handle the relations with the creative communities. The task of the manager is then to handle the in-house productive phase. This discussion on the governance phases and the evolution of the governance structure in an entrepreneur-manager perspective has certainly other implications on the dynamics of the organisation for creative firms. We discuss some of these in the following section and propose an aggregating framework for further research.

DISCUSSION: A DYNAMIC ORGANISATION REPRESENTATION FOR CREATIVE FIRMS BASED ON DUALITIES

We show in this work that the governance structure of a creative start-up in a high-tech industry can be influenced by communities peripheral to the firm, and conversely that the firm can partly structure these communities. Results close to ours have been found by several others working on large companies (Gongla, Rizzuto, 2001). Therefore the size of the firm is not a distinguishing feature (as long as the size of the firm and the size of the communities coevolve). But, as noted by Gaujard (2008), by definition a start-up is not stabilized on all its dimensions (strategy, structure, culture...) therefore a start-up in its first years is in a continuous transformation phase. During this period the start-up is at the same time more open, more receptive to external stimulation coming from communities, but also more vulnerable to outside stimulation which can lead the firm in the wrong direction. We have insisted in this work on the implication of creativity as the driver for the different changes. But this creativity is not a distinctive feature of high-tech sectors. Probst and Borzillo (2008) showed in a study of 57 communities from major European and US companies that there is no specific industry-related effect that can explain the success or the failure of the firm/community relation. For those authors the principles that govern the firm/communities relation are the same in each industry. Finally we observe that the governance phases put forward by O'Mahony and Ferraro (2007) on an analysis of a very large open source community also apply to a firm with a small community environment.

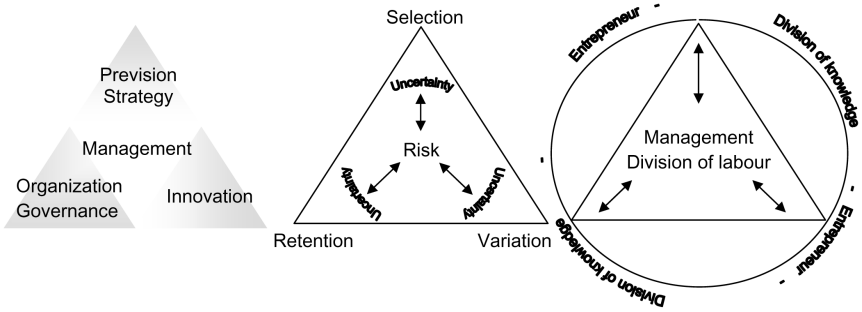
The dynamics of the firm's governance depend on the interaction of several activities, individuals and competences. In our sense the firm is stretched apart by a multitude of dualities: the manager/entrepreneur duality, the knowledge/information duality, the division of labour/division of knowledge duality, the exploration versus exploitation duality, the doing in-house or externalizing/buying on a market duality and so on. Those different dualities have a direct influence on important features of the firm. In this work we only slightly touched on the effect of these dualities on the governance and organization of a creative firm. Could such an approach help us to understand some relations that occur within the firm, or could it provide managerial insights which are ultimately the endeavour of research on governance (Finet *et al.*, 2005).

Let us use a standard strategy textbook representation of the important features of a firm (see Figure 2.a; a similar representation can be found among others in Strategor, 2005, or Johnson *et al.*, 2008). In those textbooks

management is responsible for (i) the implementation and coordination of an organization and associated governance mechanisms, (ii) formulating a strategy based on different forecasts and analyses, (iii) developing innovation and change. Usually such a representation is then used jointly with a check list of questions which makes it possible to "measure" whether the firm has invested more in management skills for innovation activities, or has in comparison a more efficient governance etc. There follows generally from this question list a characterisation of the firm in comparison with others.

Only the left corner of this triangle had been studied here and we already noticed the implication of knowledge, knowledge division and the manager-entrepreneur duality. Compared to the described standard strategy text representation we could assume that the looser the governance mechanisms the more the firm is on the left part of the triangle. Conversely the more the firm has a stabilized governance, the more the firm is placed at the centre of the triangle. The same approach can be followed for the other corner functions on Figure 2a.

Figure 2 – (a,b,c) – A general framework for representing division of knowledge and division of labour



An evolutionary economic approach of the firm would apply this approach by searching out the functions of the firm responsible for the variation, retention and selection of competences, and other routines in the firm (Cohendet, Llerena, 2009; Freel, 2000). This is depicted in Figure 2b. Following this representation, we understand that the innovation activity of the firm is the source of the variation in the evolutionary approach of the firm. The forecasting and strategy activity of the firm performs the selection of the innovations (variation outcome), and finally the organization and governance structure retains the selected novelty. In such an evolutionary framework, the entrepreneur is in charge of bearing the uncertainty and the manager deals with Knightian risk (Cohendet *et al.*, 2000). Referring to Figure 2a the more we go towards a corner, the further we go away from the

management realm. Therefore risky activities are rather in the centre of the triangle and uncertain tasks are rejected to the corners. Finally in Figure 2c, when we add the division of knowledge and division of labour perspectives, we see that the creative entrepreneurial role of knowledge division is on the periphery of the triangle and the more productive division of labour tasks is in the centre of the triangle with the manager (which is consistent with our argumentation on the selection of the competence domain and the peripheral activities).

This research shows the possible links between knowledge division and labour division and governance of the firm. Our findings are consistent with previous work on the topic of governance of community and creative firms (O'Mahony, Ferraro, 2007; Amin, Roberts, 2008) but also with the standard specification of the evolutionary approach of the theory of the firm and recent developments in that field (Dosi, Marengo, 2007; Gavetti, Levinthal, 2004). The presentation of the dynamic relation in an creative firm suggests further work (i) to make a case study on the division of labour and division of knowledge on functions of the firm other than the governance function (i.e. the innovation, planning and strategy functions), and (ii) in order to find a way of operationalizing the standard management triangle in an evolutionary approach of management.

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