

BUILDING TO INNOVATE

Architectural design and innovation management towards
a new dynamic organization

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Introduction

In a turbulent and always more competitive environment, performance and even survival of firms are conditioned by their ability to maintain and increase their competitive advantages. Innovating constantly is a way for firms to attain this goal. To reach this objective, they need to tap into the resources available on their territory.

Hitherto researches in economic geography have shown great interest in the contribution of regional and urban environments to the emergence of an innovation system. On the other hand, it seems that architectural design and the opportunities it can provide to improve the organizational performance of the firm and the emergence of creativity among workers has not received the same attention. And a simple observation of current designs of tertiary workspaces shows its possibilities to help the innovative firm are underexploited.

We aim to assess this problem from a different and cross-disciplinary perspective, namely the "cluster perspective". While the importance of this model is well established and the politic interest is still growing, the observation of the French cluster policy, the "*Pôles de Compétitivité*", shows that SMBs implication is lacking. Also, scientific literature insists on the importance of such firms for the performance of clusters.

We will argue that a new model can help solve this problem and create a new dynamic on the territory. We will start looking at the key performance factors of clusters, as presented by the literature. We will then propose a new organization for a small business engaging in the innovation process. Based on a new organizational dynamic, it would lead the firm to replicate *in vitro* some favorable conditions detected at a larger scale. However, no firm can innovate alone and SMBs frequently have limited means,

so we will propose to introduce a new structure. The role of the structure is one of mediation between the firm and other actors of the territory, and it can take the form of a single building which a specific architectural program and distinctive features. This new twofold model is detailed in the third part of the paper.

Part I: The cluster case

In a deterritorialisation era, featuring the abolition of distances by the means of the hyper-communication (virtual but also physical) there is a renewed and paradoxical interest in the relationship between economic activities and their territory, rising from the recognition of variations in the economic performance of different regions. It is generally agreed today to relatively subordinate these differences in economic performance to several factors which are "localized" in space, as know-how and knowledge resources, "human capital", availability of organizational structures, financing, and support and guidance institutions tailored to the specific need of the firms.

Economic and media success of clusters such as Silicon Valley has sparked many academic studies (theoretical and empirical) to describe the phenomenon but also (for certain researchers) to establish the conditions for its reproducibility. American academics have rushed to carry out large-scale studies, although it is in Europe where a more proactive policy framework constitutes the ideal breeding ground for the application of findings of researchers like Michael Porter. In fact his approaches are currently underpinning almost all European policies concerning innovation.

The "Porter case" seems very interesting as, focusing on innovation, the worldwide success of his theories and the debate generated within the borders of Academy has concerned several disciplines as geography, urban planning, economics, management, and sociology, illustrating its own complexity and inherent contradictions.

Indeed, although many scientists do simply still not agree with most of the concepts at work in Porter's findings, particularly in the definition and theoretical consequences of clusters, it remains that the influence of this researcher on the policy maker establishment is undeniable, to the point that some see the "cluster" as a "brand" of

worldwide success (Martin & Sunley, 2005). From this viewpoint, Porter is devoting himself to "sell" a kind of franchised "cluster case" to politicians around the world, being rapidly seduced by the apparent simplicity of the concept and the relatively easy implementation of an array of "best practices" to support, create and empower clusters in the western economies and even in those of developing countries.

The reasons of the success of Porter and the cluster case are many and should be seek on characteristics coming both from the concept and its creator: the "cluster" bearing (as we say in France) shortcomings arising from its qualities (simple and straightforward because of ambiguity, indefinite and blurred borders). On the other hand, Porter himself draws its legitimacy from its cross-over status as a renowned specialist in academic administration and management, working on economic geography with a stated aim of "policy maker".

In fact, Porter sees clusters as part of his broader approach on competitiveness, having consistently stressed (and we support his contention) that we must introduce geography and the problem of space in the center of management theory, as their strategic approach is paramount to the success of firms (Porter, 2000).

Because, space (and time) do matter. The management of time and space is a key to a successful business and influences even its final form: just as a reminder we can mention changes in the transition from Fordist production chain to the "just in time" organization: neither time nor space is considered, designed and used in the same way around the production line.

More recently, globalization and the revolution in telecommunications have dramatically reduced transport costs, not only of goods but also of sending information through space, therefore commercial activities based on information management (as well as consumer goods) can easily be outsourced to cheaper destinations. On the contrary, for the economies with high wages relocating the production of material goods (such as those in Europe or North America), the activities based on the production of new ideas relying partly on tacit information are the value-creating force within a necessarily "located" pattern of transmission based on proximity (Audretsch, 2000, see the following analysis of "knowledge spillovers").

In order to define our working hypotheses we will just mention here the main theoretical directions which emerge from a plethora and controversial scientific literature on the "clusters". We will then open to a field of research and policy until now relatively underexploited.

Knowledge spillovers and Localized flows of tacit knowledge

There is now a long tradition of empirical studies on innovation correlated to location in space that uses the concept of "geographically mediated knowledge spillovers" to explain a "knowledge production function" performed by different actors from an innovative geographical area.

While many different methods (e.g. the citation of authors in patents) have been developed which try to quantify the relationship between innovation and informal knowledge diffusion within a geographically restricted area (namely a cluster), it is clear that the essence of the object (knowledge and its diffusion) makes it difficult to use unquestionable quantitative methods. Especially since the basic premise is that there is an involuntary diffusion of knowledge between firms within a cluster, through informal channels defying conceptualization.

However, this diffusion of knowledge is considered extremely beneficial for all players in the functional unit "cluster", and carries in itself the seeds of new ideas and innovation.

Accounting for the different approaches to conceptualization and measurement of "traveling ideas" in these spillovers are:

- a. *Geographic innovation production functions*, seeking the correlation between variables such as the creation of patents or the marketing of innovative products with the presence of universities or large laboratories for R & D. The results have consistently shown that the regions with more activities generating new knowledge produce more innovation (Jaffe and alt., 1993, Sonn and Storper, 2008).
- b. *Ideas in people*, looking at the mechanism by which ideas travel: not surprisingly, it is through people. Studies have shown the correlation between,

for example, the star scientists living in a region and the innovation of firms within the same region (Zucker and alt., 1996, 1998). This view is also based on employment mobility of skilled workers: they switch jobs but keep the ideas.

- c. The *social networks* approach, one of the most recent, is logically derivated from the former trend: focus is here on measuring all sorts of networks effects that are bounded at the heart of every well-functioning cluster, using social network analysis and graph theory.
- d. The *Face-to-Face contact* (F2F) is intended to complete the knowledge diffusion analysis and the above mentioned approaches by explaining how the spillovers of knowledge take place between individuals and why proximity is the key: the type of knowledge is mainly non codified, informal and tacit ; F2F is a means to overcome coordination and incentive problems in the uncertain environment of collaborative working, inside and outside the innovative firm, and finally F2F is a key element in joining and staying inside the social networks or valued "in-groups".
- e. *Buzz and Pipelines*: The above mentioned combined features of F2F contact have been called "buzz" (Storper & Venables, 2005). It has also been argued that in an efficient cluster, its local influence in transmitting tacit knowledge is strongly related and complementary to the global transmission of codified knowledge: the "global pipelines" (Bathelt *et alt.*, 2004).

Location factors

Empirical economic studies have described two forms of agglomeration economies acting in the field of industry location and innovation:

- a. *Localization economies* seen as externalities to the firm but internal to the same branch of business : complimentary assets and activities to be found in concentrations of industries of the same kind, that can lower the costs of supplies, take advantage of a mass of skilled labour force, create greater

specialisation and boost innovation. These are typically seen as the driving forces behind the creation of clusters.

- b. *Urbanisation economies*, on the contrary, are competitive advantages coming from diversity or complementary knowledge across firms and economic agents in different sectors within a geographic region, mainly found in important cities or urban agglomerations (urban scale economies).

The cluster itself can be analyzed as having two dimensions that echo the above mentioned localization and urbanisation economies:

“...the horizontal dimension of a cluster, consisting of firms with similar capabilities that carry out similar activities, and the vertical dimension composed of firms with dissimilar but complementary capabilities that carry out complementary activities” (Maskell, 2005).

Spatial aggregation and proximity

Economic and Regional Geography have produced a wide variety of studies on high technology districts and clusters, using different concepts as *proximité*, *Innovative Milieu* (Edquist, 1997), *National or Regional Systems of Innovations* (Cook, 1998) and *Social System of Innovation and Production* (Amable, Barré and Boyer, 1997). Nevertheless they all share an interest in relating knowledge accumulation, socio-economic performances at different scales and institutional framework.

Innovation can thus be considered as produced by an *Innovation System* which is an interactive and collective process taking place among a wide variety of actors. These include other firms, organisations such as universities, research centres, government’s agencies, financial institutions, consultancy firms, legal advisors etc. The existing set of institutions and legal framework is also supposed to strongly shape the action of firms.

From these viewpoints, learning by interacting through networking is seen as a driving force within every well functioning cluster, by the means of “user-producer relationships, formal and informal collaborations, interfirm mobility of skilled workers and the spin-off of new firms from existing firms, universities, and public research centers. More generally, a key feature of successful high-technology clusters is related to the high level of

embeddedness of local firms in a very thick network of knowledge sharing, which is supported by close social interactions and by institutions building trust and encouraging informal relations among actors." (Breschi and Malerba, 2005).

At the collective level, sharing of information depends on the existence of common codes, norms and conventions that shape individual capacity to exchange and interpret knowledge. Collective learning is seen as boosted by geographical proximity of actors, which also often overlaps with institutional, organisational and technological proximity.

Innovation: Size does matters

Location may be a resource for small firms to achieve economies of scale when associated with larger operations by co-locating with complementary external resources as R&D departments of larger firms or public research institutions whose findings "spills-over" and benefit small firms.

Moreover, empirical research has questioned about the characteristics that enable a firm to better absorb and benefit from knowledge spillovers. The costs associated with learning new techniques or other activities meant to generate innovation are less if the new knowledge is relevant to the core competencies of the firm, as it embeds in existing know-how and expertise (Feldman, 2000).

Smaller firms are typically more receptive and reactive to radical innovation which can be competence destroying for a larger firm. In fact it has been found that small firms generate a disproportionate share of innovation; they can thus be considered as a mechanism for the commercialization of knowledge and a driving force in a dynamic economy (Acs and Audretsch, 1990).

Public Policy Implications

We have briefly presented some open research fields broadly concerning the geography of innovation. It remains clear at this point that whichever approach is taken, the "cluster" way seem to have gained consensus in being the privileged object of public policy, at least in Europe.

However, serious issues remain uncertain concerning how to foster innovation through public policy and investment, as the process of reproducibility of “clusters” is far from being fully studied nor achieved in a planned way. Not to mention the fact that Europe presents a diversity of innovation systems that could appeal for more localized solutions (Carrincazeaux and Gaschet, 2006).

In France, public policy concerning clusters is called « *Pôles de Compétitivité* ». In the next section we will shortly address some policy issues and results concerning these poles.

Part II: A look at the French policy, the *Pôles de compétitivité*

As we discussed in the first part of this paper, clusters have benefited from an increasing interest from policy makers. Politics are trying to reproduce Silicon Valley’s success with various fortunes. In 2004, the French government introduced the “pôles de compétitivité”. Our goal here is to present this choice, its objectives as well as its limits.

At the time, the government defined a “pôle de compétitivité” by the following elements:

- A given geographic territory. Those territories don’t exactly match the administrative divisions of France (such as *départements* or *régions*). No limitation was given to the territory size, either inferior or superior.
- Association of enterprises, research centers and teaching organizations (Universities as well as *Grandes Ecoles*).
- A specific theme. The choice of the thematic was most of the time determined by an expertise already existing on the territory. The thematic could as well concern very advanced high tech (such as nanotechnologies around Grenoble) as well as a traditional expertise (such as micromechanics in the Jura).

All actors are engaged in a collaborative partnership to bring innovation to given markets. To do so, their collective goal is to initiate and develop collaborative innovation projects. The subventions available to help fund these projects would provide an

incentive for the actors to collaborate. Success of this type of collaboration meant that each actor, as well as the territory, would increase their competitiveness. It was extremely clear that the government was trying to create clusters across the country (CES, 2008), to increase its attractiveness, to create employment, to improve innovation.

The first tender led to the labeling of 71 poles. The concerned themes are very diverse; some popular themes are represented in several poles. Depending on the initial economic activity of the territory, some of them created several poles.

In 2008, the Boston Consulting Group was mandated to evaluate the first results of this politic¹. It also showed some limits undermining the clustering effect. Although it appears that a positive innovation dynamic was created, several poles suffer from a lack of strategic management. In the 71 poles, 13 should "be reorganized", 19 had "only partially reached their objectives". The collaboration between the poles themselves should also be improved to increase the global competitiveness of the French territory, as initially stated by the government. In fact, collaboration between clusters to improve value chains was one goal of the government.

Others studies have been led proposing other perspectives. The *Conseil Economique et Social* (consultative instance placed by the Prime Minister to analyze the results of different politics) as well as the MEDEF (representative organization of the managers) questioned the place given to SMBs. It appeared that they don't benefit as much as larger corporations of their implication in the poles. This implication is obviously large in numbers, especially in more traditional poles where SMBs represent up to 90% of the firms. They're not as well represented in high technology poles. However, in the 17 larger poles, only 27% innovation projects are initiated and coordinated by SMB. In 2005, only 28% of subventions available for firms are given to SMBs.

It also appears that international implication of poles is very heterogeneous, which means they're not as efficient in increasing the attractiveness of the country as initially wished.

¹ A summary of the report is available online (http://www.minefe.gouv.fr/discours-presse/discours-communiqués_finances.php?type=communiqué&id=1648&rub=1)

Global cost of the poles has been very important: between 2006 and 2008, 1.5 billion Euros were provided to finance projects. Recently, the President has announced that another 1.5 billion will be provided to pursue this politics. Moreover, several territories have provided other subventions.

France is not the only country trying to implement clusters to improve its competitiveness. Since 1995, Germany² has been working on its own model with the intention to develop regional collaborations. The first initiative concerned only biotechnology companies: the goal was to initiate and develop an industry able to bring inventions from laboratories to the market. It was then followed by the creation of a *Kompetenznetze* label. Contrary to the French choice, this label doesn't have a dedicated financing mechanism.

In line with the bottom up approach that prevails in Germany, each cluster requests financing from different sources: regional or European funds as well as membership fees. Recently, the federal Department for Economy and Technology has taken over the control of the label and created a 1.5 billions Euros fund, exclusively available to the members of the clusters to access services. Germany now counts 100 clusters, in 9 strategic areas. Members of those clusters are 450 large firms, 6000 SMBs, 1600 research institutes and close to 1000 consulting firms. The number of SMBs in a cluster is a discriminative criterion for labeling by the Department, which leads to the observed higher implication of those firms. Concerning the internationalization of the clusters, a specific study has been ordered and measures will be undertaken.

Overlooking the differences in investment choices, France and Germany are both looking for key success factors of regional collaborations, to increase their innovativeness. There are currently no indications that the German model of *Kompetenznetze* is more performing than the *Pôles de Compétitivité* to create an innovation dynamic over a territory. However, the bottom up approach seems to give a larger role to SMBs, which contribute significantly to the performance of innovation

² All elements concerning the German policy in this paragraph, see the ADIT report, available online (http://www.bulletins-electroniques.com/rapports/smm08_064.htm)

systems. To increase this implication which is significantly lacking from the *Pôles de Compétitivité*, we're adopting a different approach leading to the proposal of a new model.

It is possible to analyze the relationship between the firm and the territory from a different point of view. Instead of observing it from the outside, as the financing of collaborative projects does, we suggest that the firm can organize itself and benefit more from its relationship with the cluster.

Part III: towards a better territorial integration of SMBs

In the first part we highlighted the importance of the small and medium-size companies for the performance of the clusters and the role these companies play in the creation of innovation, especially radical innovation.

In parallel, our short review of the French "*Pôles de Compétitivité*" shows that implication of SMBs in the collaborative projects is insufficient. Large firms initiate most financed projects, showing how these actors use the poles to fulfill their objectives.

At the same time this public policy, although useful in certain cases, is not the only possible one. Especially when considered that it represents a quite important cost while results are often far from being satisfactory.

In the lack of more precise tools, the European states are following a general policy, whose origins have been evoked in part 1, and which consists in regrouping the actors together supposing they will form an efficient cluster, in a restricted geographical space and with substantial capital inputs to start or help the development of business activities inside these "clusters".

This quite approximate policy is far from being the most effective or the most environmentally conscious. In this situation, in most cases greenfield urban space is consumed, enormous financial resources are mobilized, in short "artificial giants" are created, expecting that they will take life by themselves.

Awareness of these weaknesses leads to proposing alternative models which should provide perspective and help complementing the actual territorial economic policy. The principal reason underpinning our proposal is that SMBs should be the main actor of these processes: it is widely accepted that their small size makes them not only more flexible but also more powerful in term of production and marketing of the innovation.

An alternative way consists in "staying small" in the Schumpeterian tradition: if several beneficial functions have been found to be fulfilled by clusters the idea is to develop, maintain and optimize these functions not in artificially created clusters, but in structures as small, economic and sustainable as possible.

Our model is articulated around two elements that integrate in a complex way the two dimensions of the clusters, horizontal and vertical:

- Research for SMBs of a dynamic organization that enables them to better benefit from advantages traditionally associated with clusters. This organization comes as an answer to two main issues:
 - Innovation in strategic management of the company, its organization and its structure.
 - In addition, some aspects of localization and architectural design of the firm must be taken into account to support the development of communication and tacit knowledge flows. The ultimate goal is the creation of a kind of "internal knowledge spillovers".
- The need for a mediation structure between SMBs and other actors of the territory. This structure will help each firm take advantage of its position within the territory and amplify the advantages the firm can draw from formal networks (institutional, financial and research ones). Other actors of those networks are generally of bigger size and do not share the constraints of SMBs, which are very limited by their cash position. This mediation can also intervene in the relation of SMBs with the larger firms: the latter suffer from their aversion to the risk, which can be partly absorbed through such a structure.

The literature on clusters assessed in Part I show several key success factors of the clusters. These are of three types:

- The dissemination of the informal and tacit information is done through personal communication, basically in F2F contact; it is complemented by the transmission of codified knowledge through networks, local or global.
- The innovation is always a collective process, it is the result of the interaction between several private actors and a system of institutional resources like financing, legal advice, public research centers, etc.
- Geographical proximity plays a prominent role in all the cases, that is to say the contacts in F2F, the access to a pool of external resources, economies of scale, local markets, suppliers in the same branches of activity, a consistent offer of qualified jobs, etc.

To internalize these factors, we propose thereafter a new organization of the company dealing with an innovation project³.

Innovation, a collective process from an open organization

The process leading to the innovation aims to decline an idea in product, process or new service, which will then be marketed by the company. For that, it must mobilize different competences and different people at different times. The control, then optimization and maintenance of this process, are at the heart of innovation research of strategic management. That poses various problems in terms of definition of the company's strategy but also of the organization of the structure and the allocation of resources.

In spite of the abundant work undertaken on the strategic management of the innovation, some ambiguities remain (Carrier and Garand, 1996), which justify the treatment of the innovation from the point of view of the collective process.

³ The term "innovation" presents the defect to as well indicate the process by which a company produces a new product, process or service that the result of this process. Our interest goes in a general way on the process and its improvement, with an obvious aim to improve the performances of the company.

First, it is not possible to consider the only moment when the innovation meets its market. It is necessary to consider the process of innovation, i.e. the whole of the stages necessary to the company to bring to a market a product or a service.

The growing complexity of the technical and economic environment makes it difficult for an isolated entrepreneur to disrupt the environment, in the Schumpeterian acceptance of the term.

Sociology made it possible to improve comprehension of the process, improving the vision of Schumpeter entrepreneur-innovator (Mustar, 1994). It also showed the need for the company to stay open to its environment, to acquire new knowledge but also to prepare this environment for the innovation and to maximize its success.

Using a descriptive approach, we wish to explore the transformation of organizational constraints, internal as well as external, supported by the company along this process.

The first phases of the project are particularly interesting because they depend more on creativity than more formalized phases of the development. A key performance factor of these phases is the emergence of a multiplicity of ideas, as transverse as possible. In order to obtain those ideas, the company must organize itself internally as well as open up to external competences.

Inside the organization

To describe the internal functions of this new organization model, we will use the tools provided by Mintzberg in "Inside Our Strange World of Organizations". This wide study provides the researcher in management with a tool for description of the organizations in the form of 7 configurations, which are as many ideal-types. Other researchers have proposed other configurations⁴, however Mintzberg's are the most exhaustive to this day.

⁴ This question was also studied by Aoki, which proposes a more cultural approach, considering the differences in performances between Japanese and American firms, whose organization is more hierarchical (Aoki, 2000 and Aoki, 2001).

Innovation poses a double set of constraints to the organization, which should both creative and performing. We make the hypothesis of an organizational dynamic, based on the coexistence of two configurations:

- The adhocracy or innovating configuration;
- The entrepreneurial configuration

The adhocracy is the configuration described by Mintzberg as best suited to produce sophisticated and complex innovations. It shelters projects teams of small size, made of experts coming from various fields, selected according to their competences and the kind of problem to be solved. Circulation of information and knowledge flows is favored. Hierarchy is almost absent from this structure; strategic top is primarily turned towards commercializing activities. This configuration encourages contacts between people and the creativity through circulation of information and knowledge. However, it is limited by the same factors that make it permeable to knowledge spillover:

- It is creative, but not efficient mostly because of an ineffective strategic elaboration mode, based on the systematic research of a consensus.
- This strategic elaboration mode is a limit to the growth of the structure, which has to stay small. In a hypercompetitive context, it's a handicap.

We thus propose that the innovating company mitigates the limits of the adhocracy by the adoption of an organizational dynamic based on the coexistence of an adhocracy and entrepreneurial configuration. In this last configuration, the strategic top takes the leadership and directs the structure in a coordinated and offensive way, ensuring the development and the follow-up of the strategy. This leadership is frequently assumed by only one person, which can lead to a certain environmental myopia.

The collaboration of the experts of the adhocracy, able to deal with complexity, and of a "strategic force", which works out and implements the strategy, makes it possible to direct ones and to widen the prospect for the others. That allows the combination of the creativity and the follow-up of a direction for the project and the company. The coexistence of two modes of strategic development requires a consideration on the strategic management of the company, to perimeter of action of each actor.

The coexistence of these two configurations, adhocratic and entrepreneurial would allow the firm to operate as a horizontal cluster. It poses constraints in terms of human resources management and organization of the space in which the actors of the company interact. It is indeed necessary to create the conditions of informal exchanges, by allotting time and creating meeting places. As example, the corridors of the building can be oversized to allow circulation but also the conversation. Amenities must also be conceived to support the interpersonal exchange and boost F2F informal contacts. That implies however that these periods are considered like working times, productive for the company.

Connecting the organization to the territory

In spite of these elements, it appears that the company, particularly when it is of small size, cannot innovate alone. The growing complexity of the scientific and technologic knowledge, as well as the increasing number of professionals contributing to the success of innovation projects, pushes the firm towards networks. The approach by networks has been the subject of much research, particularly in sociology of innovation (Callon 1994). This work raised the question of the relationships between research laboratories and companies. Work has also been undertaken on inter firm collaborations (Gonard, 1997). The multiplication of the financings for the collaborative projects was accompanied by an increased interest of the researchers in management.

A particular interesting aspect is that of a configuration supporting and favoring serendipity. Exceeding the case of mere subcontracting or collaboration around defined specifications, it is rather a question of creating contacts which will spur creativity and will make it possible for each professional to jump in at the most relevant time in the process of innovation.

The question of the externality arises insofar as SMBs cannot integrate the whole of the necessary functions. Balance between exploration and exploitation is particularly problematic in SMBs, considering the limited number of resources available. This problem worsens in the case of collaborations with actors of bigger size (in particular

institutional actors or research laboratories) whose constraints regarding time are less demanding.

it is necessary to have on a given territory a mediating structure, complementing the reorganized firm, connected to the needs of the companies through their strategic top. Through this structure, a vertical integration of SMBs in cluster is set up.

Beside its mediating role, this structure would propose services for innovation; especially for competences SMBs may lack due to their small size. This structure also needs to reflect on its internal organization and create an in-house information flow.

The question of the efficient size of this structure must also be dealt with. It is thus able to create sense into the relationship between SMBs and the territory as well as play an important part in the performance of the cluster.

To reach those objectives, it must integrate researchers in various scientific fields, strategy professionals able to define directions for the projects, and specialists able to carry out the operational stages project development (engineers, financial and lawyers). Workspaces for start-ups as well as the spin-offs of other firms should be allocated in such a structure, which will also allow them access to resources and services.

Clusters as Art and Science: Architecture

As we have been arguing, the blurred boundaries of cluster theory and approximate policy, although persistent, should not prevent from triggering further research, development and policy initiatives. And considering the science of cluster analysis as identifying all its actors, processes, interconnections, functions and activities related to place (from local to global) one could say that inevitably "inferences and judgments" have to be made, and in that sense "the "science" of clusters is partly an art" (Perry, 2005).

Indeed, considering all the relationships and factors working together in a cluster, the idea to concentrate all the functions that claim for proximity in a new typology of building is just far from being nonsense: typically a trans-disciplinary "buzz" deriving from F2F

contacts can be boosted by a reinforced proximity within a specially designed spatial framework featuring communication and exchange between workers as a goal.

The “creative buzz” can be developed *in vitro* by an adequate architecture and therefore exploited by a consistent management, allocating time and space when necessary (creative processes in the starting phase of the projects) and favoring formal and structured ways of communication in later phases of them, using appropriate spaces for these activities (e.g. meeting rooms). This feature can be twofold: a recommendation to all SMBs managers (that should increase their interest in the management of space and place) and a key element of the new mediating structure.

The style and aesthetics of the workspaces is far from being irrelevant if focus is made on harnessing ideas and creativity: lessons learnt from the firms of the so-called ‘new economy’ (even if it has collapsed since) appeal for open, “no-collar” workspaces deriving originally from the artist’s studio and the university laboratory (Florida, 2002). The environment of creativity is not a fixed one, nor is it stable. The architecture of these new spaces should find an unstable balance between creative chaos and efficient order, and a straightforward copy of the colored spaces of Google-like companies simply won’t do the trick.

Moreover, the need for flexibility in the allocation of time and space demand either multi-functional “no thrills” spaces or dedicated and highly specialized spaces with controlled and restricted access, available for workers following management directives.

In addition to these general directions, a whole architectural program can be defined corresponding to the innovative organizational structure and management model and its components, namely:

- an applied multi-disciplinary research center;
- a competitive intelligence center;
- a business center supporting technology transfers and valorisation;
- an engineering and financing center;
- a pre-incubation center for start-ups and spin-off companies.

We have to learn how to deal with contradictions like this one: these “blocks” of activity are identified and specialized enough to deserve a properly defined allocation of space, while at the same time interconnection, embedding, and permeability of activities are key features. In the same line, privacy and secret are sometimes important when one manages outsourced projects of client companies that can compete with hosted start-ups, for instance. So the pre-incubation center has to be a part of the whole, participate in the activities, but in a somehow controlled way.

This “mediating structure” building should be built in brownfield locations⁵, ideally in an exciting, multicultural and challenging urban environment, where social networks can develop, and location advantages (either institutional or merely those capturing the powerful creativity of city life) are maximized.

Considering both the new 24/7 ideology underpinning nowadays highly creative work organization and the search for the “internal buzz”, all sort of amenities should have an important place in the model, like corporate restaurants, video-rooms, exhibitions spaces, sport and training facilities, etc.

Further architectural and ergonomical research could be envisaged about special technological devices that could help keeping track of findings from internal buzz when needed or develop and foster collaborative informal instances of spontaneous work like collective brainstorming.

Ideally, another feature of this type of building should be the possibility of temporarily add workspaces or amenities for outsourcing functions like incubators of start-ups, because the quantity and the size of these new companies can vary along time. The size of the building and thus its form should be adaptive to this, equally avoiding permanent consumption of built surfaces, energy, etc.). At the same time keeping an overall image of “work in progress” building can help maintaining a creative attitude among workers.

⁵ To limit the consumption of greenfield areas which are also in general far from urban life.

Conclusion

By adopting a new point of view, we intend to contribute to a higher implication of SMBs in the existing innovation dynamics and to improve the performance of French clusters and innovation in general. In our twofold model, the organization of the firm is important and will be the object of further research but it's in fact the new "mediating structure" that we have been focusing on as we consider it as a possible contribution to innovation policy and innovative activities of SMBs firms.

Materialization of a new "mediating structure" as part of the proposed model poses that a reduction of scale can intervene in the complexity of a cluster configuration, keeping functions and relationships in the stretched-off space of a building (plus local, regional and global networks) instead of a region or a local urban area. Of course, this can be seen as a bold hypothesis. Indeed it is.

But one have to consider that, although being under specific technical constraints, given the scale reduction, architectural space is more manageable compared to urban and territorial environments.

If a small scale new typology of building dedicated to foster innovation can perform at least some of the functions a productive cluster hosts, given the crisis context one simply cannot ignore this hypothesis. Not to mention the more reasonable allocation of financial and spatial resources that would certainly appeal to every environmentally conscious policy maker.

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