

Building Markets for Knowledge Resources

Emerging Pervasive Models of Innovation in Practice

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Emerging Pervasive Models of Innovation
in Practice

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INVESTOR IN PEOPLE

Introduction

The work aims at expanding knowledge of a phenomenon already sufficiently treated in its general lines in the literature and in more precise connotations of key factors identified (from the nature of knowledge incorporated into innovation, to the various strategies of giving value to research, and organizational solutions able to back up or stimulate the processes of growth). The work deals with the conditions of contexts that provide the starting points or origins for innovation, that is, where a fertile humus is to be found for its development and what distribution mechanisms of knowledge can be activated or used to produce value. Only through planned *ad hoc* research is it possible to resolve the high level of complexity of the phenomenon under study, determined among other things by the high number of contributing components, and therefore, of potential relationships among them (from the single business to collaborative networks and technological clusters). The phenomenon in examination, in fact, is characterized by the presence of actors that are different in nature – public and private – and dimension – singles and groups, together with personal motivations, but appears as a system of clear social and economic interest, both local and national. In fact, because of the number of variables in play and the presence of wide areas of overlap, it is not always possible to show a correlation between the characteristics of innovation and their results in terms of performance.

Markets for Knowledge Resources and Innovation: What's the Link?

The transformations induced by innovation in different operational settings have generated changes and phenomena of transition toward a completely new phase in the evolution of society, in which the structures of the enterprise, of science, democracy, the market and information have recomposed around novel

premises. On the other hand, the functional separation of innovations, with the definition of their respective boundaries has not brought about complete reciprocal isolation. The various settings, though differing in origin and specialization, are inter-permeable and continually give rise to contamination and reciprocal transfers. In particular, the conditions for the creation of knowledge cannot be cut off from the radically new technological conditions determining its dissemination: an accelerated and pervasive dissemination, because of the effect of the IT revolution. Under the impact of electronic mutation, information systems have undergone a formidable process of strengthening, differentiation, and acceleration, up to the limit of “real time.” However, one problem that arises concerns a need for symmetry in the production and distribution of knowledge, where, given the scope of reinforcing long-term competitiveness, there is some need to guarantee the continuity of these processes, over time. Attention moves, then, to methods of accumulation, distribution, and communication of knowledge that depart from a purely utilitarian notion of the capacity to promote new “spaces,” moving from the market to the territory and to the collective conscience. These spaces are being ceaselessly sought by “doing” innovation, but innovation that does not depend on a linear cause/effect relationship, as it is the result of complex (and mostly unpredictable) interactions between technical, economic, and social factors. Furthermore in order to establish real and virtuous conditions of competition the excessive juridical protectionism for the results of intellectual activity that restricted and concentrated the offer of innovation in a few hands has given way to freedom of action (one thinks of free revealing) that collects and stratifies knowledge to make it autonomously available on the markets. On the other hand, developing the capacity of finding the sources of innovation in the social setting, in aggregations, in the communities of practices, with their own intellectual interests, social attitudes, and professional relationships, inevitably opens up new possibilities for experimentation (consider the living lab), inverting the vector of authority, passing from linearity to creative chaos, from hierarchies governed from above to the collective that self-organizes from below. In this way, specific location and globality, like the rest of the private and public dimensions, share an apparently more compatible new equilibrium of innovation, in which one does not exclude the other, and, above all, where the contents of one also represent the meanings of the other. It would seem, then, that there are no fixed points in the field of innovation.

Instead, what seem to be some of the fundamental problems on which to dwell, regard the relationships between imitation and innovation, and the constant dialectic between the convergence and differentiation of the same. What is this about? It is typical of the enterprise to aim at a constant renewal of its standards and its structures: it is precisely the mutability of these factors that is one of the characteristics of this social phenomenon. Conversely, it is just as typical of enterprises to try to imitate competitor behavior that that is already legitimized or that is about to be legitimized. The constant closing or widening of the gap between the two tendencies constitutes one of the substantial evolutionary mechanisms and the durations of imitative and differentiating phases vary according to epoch and to socio-economic, cultural, and political conditions. (...).

An important question arises: if, in general, one must consider the enterprise as naturally tending toward the conservative element or toward the revolutionary. This question would be enough to tell us how the situation of entrepreneurial behavior is ambiguous, and how one may slide from one position to another with great ease. (...). It often occurs that the enterprise voluntarily returns to past modules and schemes, when these very same models may be taken as a starting point for a renewal that often is not clear, but that is enough to justify the characteristic instability.

It is probably also for this reason that innovation is studied through systemic models, a type of structure less dependent on the perfect functioning of each of its parts. Analysis of innovation must co-exist with structures made in this way, in which, because of the interconnection between the parties, the model becomes more reliable than each of its component parts, since it activates social and institutional relationships able to govern the markets and to produce value in the most coherent and advanced forms.

Since institutions (firms, associations, international organizations, etc.) have increased their awareness, and above all consumers have become more mature, sustainability research, in the logic of the book, becomes feasible (from the economic, organizational, and technical point of view), if it results in the identification of new models of development that are consistent in leading to operation of the levers of a new profitability. The process of performance intensification inevitably begins from the promotion of an update of production and management methodologies; on the other hand, new strategies and new players allow for the development of economic and social relationships that are more

beneficial for everyone, starting from the actors who perform them. Of course, in order to plan the change in the way of being and of doing business, where rules and expectations have varied, and with a potential for growth not acknowledging the market criteria under which the firm has lived (and, in many cases, survived), there are three pillars on which the evolutionary approach should be founded: economy, environment, and society.

In particular, the research project aims at demonstrating that innovation generated in the context of trans-disciplinary application, and created by a diverse selection of topics and places of competition, requires new incentives for the generation and sharing of knowledge and for taking on responsibility.

Joining together strengths and ideas, combining knowledge and investments, embodies that view of exchange and interrelation, which is the core of knowledge-based economy.

Overview of the Book

We introduce some important implications for the future of innovation management both as an activity and a field of scholarly enquiry. First, we contend that what is called “open innovation” is itself composed of, and shaped by, a variety of formal and more particularly informal knowledge sources. Second, the general literature on innovation has been largely concerned with science and technology, but knowledge management has the potential to supply a much needed appreciation of the role of the non-economic dimensions of knowledge as a stimulant of innovative production and dissemination.

This book discusses emerging pervasive models of innovation and how their nature, effects, and origins are characterized. Our notion of innovation is consistent with the common belief that the term “innovation” has a much wider meaning than the one that may be inferred from its literal interpretation. However, innovation management can, in principle generate, a vast variety of new insights for revealing and accessing knowledge and offering alternative learning approaches for corporations, which are active in knowledge transfer. This approach offers a systematic and diagnostic way to work through the evolving features of open innovation processes and provides the basis for a substantive analytical framework useful for investigating how private and collective perspectives can be realized in the industrial and the social context.

The book starts with the definition of markets for knowledge resources and analyses its methodological evolution and some of its applications. It also looks at the interaction of market players (e.g., suppliers, customers, competitors, laboratories, and research institute) as the fundamental prerequisite for promoting the development of the new era of open innovation.

By focusing on different organizational models and considering both mechanisms pecuniary and non-pecuniary, the book aims at comparing the theoretical assumptions and the managerial implications of the emerging open business models with the traditional closed innovation models. Essentially, the open business models are characterized by the fact of encouraging innovation as part of the interactive co-creation process outside the boundaries of the firm. This makes a mixture of *models of innovation in practice* desirable, even though the dynamics within the organization or between organizations could lead to emergence of a new, more or less destabilized, equilibrium.

CHAPTER 1

The decision about whether to “make” or “buy” is certainly a well-established topic of study, and it has engendered a conspicuous body of literature. All the usual approaches to the question have in common the fact that they restrict their studies to the area of production, limiting their analysis of “make or buy” decisions to contexts that are prevalently operational and only rarely highlight the strategic value of such decisions. They are, indeed, essentially based on the quantitative examination of the alternatives, considered in conjunction with requirements of a qualitative nature. In such analyses, which are essentially based on comparing the costs of “making” or “buying,” the quantitative aspects that become predominant. However, these comparisons are not based on a standard methodology that can be adapted to every case, and neither are the costs that are taken into consideration determined univocally. Underlining the difficulty of making a correct assessment of the alternatives between making or buying caused by the unpredictable nature of the conditions that influence these choices, forces a critical review of issues relevant to scientific research and managerial practice. In reality, efficiency can only be defined by starting from a given set of achievable results. To start with, consider the need of information associated to making use of the markets. In order to effect a market transaction, one must first decide with whom to negotiate, inform them

about this and the relative terms, then carry out the negotiations to reach a deal, draw up the contract, carry out the necessary checks to verify that the contractual terms will be respected and so on (Coase, 1960: 15). As suggested in the principle of efficiency, there is a tendency to adopt organizational models that reduce transaction costs. Generally, in a market system, in order to increase economic value, transaction costs linked to problems of coordination must be minimized. These problems arise from the need to determine prices and other transaction details, and to make the existence and location of potential buyers and sellers known, putting them in contact with each other so that exchanges can take place. Among the transactional difficulties is that of not recognizing that there is the opportunity to carry out an exchange. If *economizing* on transaction costs means that the company can then invest in potential opportunities, the benefits for the company will go beyond those relating to static efficiency, since future opportunities also come into play, and these may not be available to companies that have not made investments in *co-specialized assets* (Kogut, 1991; Chi, 2000).

CHAPTER 2

For the purposes of the work that follows, the objective of this chapter intends to show that the management of enterprises is more and more notably influenced by the resources of knowledge, in the different forms through which these employ their own potential with the aim of increasing the growth prospects of the technological capability and, by extension, the prospect of generating the technology of the future. In the last few years, the intensity of competition, the processes of technological convergence and the dimensions of the global markets have determined a progressive enlarging of the area of sourcing resources of knowledge and of innovative competences. The work that follows represents an attempt to interpret emerging entrepreneurial behavior types adopted in the development of innovation, where the definition of the constraints of R&D and of the governing structure of the activities takes on the value of a fundamental choice for the development and use of the knowledge base of an enterprise. Knowledge of a mutual technological dependency and the integration of the organizational constraints have the effect of moving the locus of innovation to a community level rather than to an enterprise level, thereby making the profits

associated to internal development of technology unsustainable in the long run unless the organization is able to integrate the external development and to build its own knowledge base on a technology that is in continuous evolution. The great power of the markets does not only regard its informative properties but also its function as generator of variety in innovations and capabilities that are subject to selection. The market as an assembly of enterprises that pursue different visions and that are organized with distinct identities, so it generates a variety that individual enterprises cannot produce internally without detriment to the division of labor and to the relevance of the focal rules (the organizational principles) with which the work is coordinated. Effectively earnings are based on the “scarcity” value not only of resources but also of the behavioral coordination within the enterprise. This dynamic between the capacity of an enterprise and the market remains at the heart of Stigler’s argument that an enterprise moves from vertical integration of its activity to its disintegration according to a process in which the market “learns” to provide itself with input at a lower cost than it is possible to do alone (Stigler, 1951). If the market has superior capacities for generating variety and enterprises are superior vehicles for the accumulation of specialized learning, why are specialization and variety seen as antithetical concepts within an enterprise but are defined as complementary in the market? Smith (1965) sees the division of labor as deriving from the learning dynamic, through specialization. He claims that *a priori* individuals are similar enough in their talents; the differentiation into specialized competences comes about as the result of, rather than the precursor of, the division of labor. In other words, specialization through division of labor is the driver of the acquisition of competences and, consequently, of knowledge. The perspective of the enterprise, as the repository of knowledge embraces Smith’s observation on learning derived from experience, through a division of labor that is posed both as a static problem of coordination and as a determinant of the dynamic pathways of acquisition of knowledge. Enterprises are social communities that allow specialization in the creation and replication of organizational principles of work, partially tacit, partially explicit.

CHAPTER 3

When management literature is analyzed within a key strategic approach, this seems to indicate that the possible theoretical

alternatives are clear and can even be measured. These potential choices are between efficiency and market power, organizational skills and strategic flexibility, and stakeholders' expectations against survival and development (Hillman & Keim, 2001). There must be room for all these various possibilities in today's world, that often enhances paradoxes and contradictions which can lead to speculations based on the long-term observation and study of organizations (Waddock & Graves, 1997).

With management becoming increasing more complex, there is the need to take a step back and verify the relationship between business theories and actions. The continuity between the issues and empirical methods on which models are built and management experiences are coded can put business management into perspective, and help to take account of predictable new management models.

With this in mind and within a business context of great managerial and scientific interest – that of building *markets for knowledge resources* – the aim of this work is to examine how the process of identifying business opportunities is almost inextricably intertwined with that of analyzing competitive advantage and its sustainability (Van de Ven, 2004; Peng, 2008; Henisz, 2004). Note that by competitive advantage sustainability, we refer to the dynamics of survival that, in such a complex game, means verifying whether there is the strategic ability to pursue above-average profits.

Sourcing external knowledge can be seen as an alternative to the traditional method of implementing strategic options for the purposes of development (Christmann, Day & Yip, 1999; Penrose, 1999). In order to prove this, this work is concerned with identifying the various types of pressure that come into play and produce many different “alternatives” – which can be differently designed and vary considerably over time – that are reflected in the organization's economic behavior and that influence the levers of performance, the way these levers interact and the ensuing consequences.

The discussion about *internal or external resource sourcing* seems to suggest that the reality of business makes it very difficult to see how a series of seemingly incompatible performance goals can be combined meaningfully. It is important to understand that the way companies behave must not be defined only through the rationalist model of cost and the systemic model of environmental and market conditioning. It should, instead, also involve the company's attitude toward acquiring the right *resource positions*

to support the conditions for development and to fulfill its strategic interests. It is in this area, especially, that competitive action on markets is unfolding, an area that is, moreover, changing and renewing over time to ensure an equitable “balance” between entrepreneurial culture and business economics.

CHAPTER 4

The chapter starts with an attempt to characterize the “markets for technology” and the “markets for patents” in today’s social, economic, and research system. In an economic model based on the exchange of knowledge resources this conceptualization for interpreting all the most significant forms of interaction, can be adapted to cover all of the many (explicit or implicit) methods of “governing” the relationships of exchange that take place in the market, or, in general, wherever conditions of inter-dependence are linked to the presence of external effects. On one hand, it is necessary to explain, on the basis of efficiency criteria, which intellectual property rights structures must be configured, and on the other, a comparison must be made between the consequences that different intellectual property arrangements can have on social allocations of rights and value creation.

The literature on the management of intellectual property shows how a contrasting set of theories and practices, principles and interests, ideologies and common norms, has forged the rules under which the value of ingenuity is managed. Even the evaluation of the rate of innovation by simply counting the number of patents registered is partly an end in itself, if the count does not discriminate those that are economically relevant (there are foreign study and research institutes that consider the criterion of revenue generation as more important) and if there is no agreement on the validity of the patent as an instrument with which and for which research is undertaken.

In other words: are patents economically convenient? This may seem the sterile subject of an exquisitely academic debate, but in fact the economic validity of patents is one of the key aspects of intellectual property. Besides, there is no shared position with regard to the question of who discovers the ideas and then who owns them and, above all, in what way they may use that ownership. And the argument that it is not possible to be creative without being “forced” to exceed some limits (deadlines, solutions found by others but already patented and so on) is also valid up to a point.

Evidence from scholars shows how there are no fixed reference points for the argument on the topic. Their interpretations vary according to the different historical conditions. Over time, there has been a concerted effort to find the most acceptable compromises between the interests of the inventors, who want concession of monopolistic privilege on the works they produce, and the public need to enrich common knowledge assets. The acceptability of the compromises depends on the technological paradigm. It is clear, that these paradigms alternate and change unpredictably. For example, biology and digital advances do not adapt to the old compromises. The stakes in play are thousands of millions of dollars, so that while on the one hand we are experiencing the exciting dawn of technological innovation, on the other there is the risk that the rush to patent potentially very remunerative discoveries may bring about the exact opposite, putting a brake on development and innovation. Furthermore, with the acceleration of economic dynamics through the rapid development of technology and of communication, the evolution seen in these sectors is in conflict with the system of intellectual monopoly, and interpreted as a deteriorating mechanism that poisons competition in many sectors and creates distortions in the market.

Several parties claim that open source is the solution for getting out of the swamp of intellectual property. Every social context has a special organizational logic, commonplaces, and forms of expression that are the mirror of a specific cognitive and cultural model. One of the current “topos” of “commonplaces” is the crisis of the traditional concept of intellectual property and the rise of alternative proposals for the management of copyright and royalties, thanks to which the holder of the rights, through the application of specific licenses, concedes a series of freedoms to the users of the work. This alternative model was initially developed mainly in the setting of information technology (the free software movement and open source), but in the last few years it has extended to the whole world of works of ingenuity (with the movements Creative Commons, OpenAccess, Opencontent, etc.).

CHAPTER 5

The consideration of the market (and of the relative prices) as the exclusive modality of management of the transactions brings out questions of prevalently theoretical aspects but also essentially

practical ones, given that the infinite opportunities of open innovation have required the invention of a wide variety of alternative methods of exchange because of multiple and new incentives (that go from avoiding costs of IP protection to earning a reputation, to enlarging the market of reference, and to developing learning and informal behavioral codes, etc.). These relationships are partly programmed and partly aimed at experimentation, they share more or less explicit knowledge and stronger or weaker links, and refer to enterprises able to make their own resources “liberally accessible” for recreating a setting able to create and use the knowledge (from individualization of the most efficient production processes to technological renewal of existing products, to the planning and creation of new products). In order to focus specifically on the business models and mechanisms often associated with Chesbrough-like open innovation, we need to carry out more detailed theoretical and empirical studies about the varieties and purposes of open innovation. Conceptual advances and the generation of empirical knowledge must be developed both simultaneously and interactively. Highlighting the dynamic nature of the field is the fact that, although a great many innovation projects within organizations are certainly “open” while not usually perceived as such, their scope has expanded to encompass emerging work on knowledge. This is because the boundaries of the field remain permeable and are in a continuous state of flux. The intellectual activity involved is on a much smaller scale than would have been necessary to define the evolving features of open innovation processes empirically. It has, however, been great enough to provide the basis for a substantial analytical framework useful for guiding further research.

CHAPTER 6

Innovation experience, with changing fortunes in the conquest of markets, leads to the recognition that the external environment is not an undifferentiated context. The environment is composed of organizations, often very powerful (enterprises, governments, political parties, movements) that formulate multiple questions, often in conflict with one another. The choice of the demands to be met is not arbitrary or accidental, but it reflects the need to ensure the resources necessary for survival.

This vision of the relationship between business and environment is fraught with conceptual consequences. The first is that if

a company sets its goals, selects its allies and partners, exerts pressure, and develops a policy, then, the operating environment is not something obvious and unchangeable, but it is largely selected and shaped by the company itself. The second consequence is that the condition of independence, within the choices made by the economic actors, appears more as an exception (justified by the artifice of the perfect market) than a rule of general validity. The rule is rather the interdependence among the actors and the strategic game between them: interdependence is, however, ambivalent. On the one hand, the rule favors the possibility of coordinated actions and thus increases the overall power of intervention on the environment. On the other, interdependence requires mediation and prevents individual actors from achieving results fully compliant with their desires. The firm's counterparts (banks, shareholders, unionized labor, local and national political government, competitors, suppliers, and customers) are less and less "anonymous factors" that the company purchases on the market from time to time. They also tend to become bearers of specific interests and mutually influence powers. In fact, this consideration leads to the conclusion that it is not possible to sever the influence of external constraints on the ultimate goals of an innovator. Through influence and bargaining, the various players are involved in the choices, seldom making the "scale" and "scope" of the innovation unique and well defined. This chapter deals with the broad concepts of innovation, relationship models and knowledge systems as the focus of a scholarly enquiry into open innovation development analysis. As research advances, it brings together the experience and theoretical interests of different social and economic environments. It is now necessary to identify an integrating framework that can clarify the state-of-the-art in the field and extend the boundaries of what is already a significant volume of literature. The core concept here is that an open economy, where the sources of invention, innovation, and manufacturing capacity are on a global scale, represents a system in which different players with distinct, individual businesses are joined or merged together as a critical medium in which to support the creation of knowledge and promote innovation. If the appropriate synergy can be activated, this is the most practical and effective way to improve the competitiveness of a business, beyond the more or less formal organizational mechanisms (from long-term relationships to networking) put in place to stimulate development processes.

The aim of this chapter is to describe the most relevant features of the Triple Helix approach, highlighting the factors on which its architecture is built, in order to unveil the independent physiology of smart cities. It is required that research centers, organizations, local government, and citizens depend upon businesses in order to discover their pathways; and this will appear to be more functional when, from an open innovation viewpoint, the structure is considered more inclined to knowledge sharing. As clearly pointed out, smart cities cannot, on these grounds, be simply deemed as forges of more or less innovative technologies, but the focus is also on knowledge capitalization, considered in all its aspects (cognitive, economic, social, and cultural), while sustainable solutions may be found by involving all citizens. In the end, a Quadruple Helix approach is introduced by taking into account the contribution of the active population. However, satisfactory economic performance is measured in the context of economic relationships with a number of players and institutions that do not simply pose restrictions over the choices that the firm makes, but are clearly capable of influencing corporate objectives while they are in the process of being made.