The Process of Strategic Innovation. A System Dynamics Approach

Carmine Garzia[*]

Abstract

The paper presents a System Dynamics model that explores process of strategic innovation.

Strategic innovation is the result of a dynamic process that enables companies to redefine the way to do business delivering more non-monetary value to customers with a high level of operational effectiveness. The firm's ability to generate and implement strategic innovation is determined by the diffusion on a certain degree of entrepreneurial orientation among front-line managers. Entrepreneurial orientation is determined by the introduction of organisational innovations that allow the release and the control of the entrepreneurial energy embedded in the organisational structure. Front-line managers contribute to the renewal of the firm's strategy developing strategic initiatives supported with resource allocated by top managers.

The effectiveness of the process of strategic innovation is influenced by top managers' ability to recognise main feedback structure and to control two critical trade-offs. First they have to balance the entrepreneurial orientation of middle-level managers with a certain degree of strategic discipline to govern the selection and integration process of new strategic initiatives, secondly they have to balance resource allocation to support exploration activities finalized to generate new strategic initiatives and exploitation activities that allow strategic initiative development and integration in the strategy of the firm.

[*] Università Della Valle D'Aosta, Facoltà di Scienze Politiche e delle Relazioni Internazionali and CEF Center for Entrepreneurship and Family Firms, Università della Svizzera Italiana, Lugano. Email: c.garzia@univda.it, carmine.garzia@usi.ch,

Introduction

The central problem in strategic innovation literature is to understand how it is possible to generate a constant rate of innovative strategies that can renew the company strategic position to achieve better performance. To answer to this question, we built a System Dynamics [Forrester, 1961, 1968; Sterman, 2000] theoretical model based on previous researches on competitive strategy and innovation.

In our System Dynamics model the ability of a company to generate and implement innovation in strategic positioning is determined by three factors. Strategic innovation processes occur in firms characterised by a certain degree of entrepreneurial orientation. Entrepreneurial orientation is determined by the introduction of organisational innovations that allow the release of the entrepreneurial energy embedded in the organisational structure. Secondly, thanks to the diffusion of entrepreneurial behaviour front-line managers can contribute to the renewal of the firm's strategy introducing strategic initiatives developed thanks to tangible and intangible resources allocated by top managers. Thirdly strategic initiatives become strategic innovations thanks to top managers efforts to integrate new initiatives into the firm's strategy.

The paper has been structured into four parts. The first and second parts are dedicated to the exploration of the concept of strategic innovation. The third part is dedicated to the formulation of the System Dynamics logical model. The fourth part is focused on resources dynamics.

Strategy renewal process and resource dynamics

A fundamental question in strategic management literature is whether and how firms survive to environmental change. Poor performance, demographic and social shift, technological advances and change in human aspirations are some of the causes that erode the fit between the organization and the environment [e.g. Andrews, 1971]. Despite the importance of such questions, literature lacks of an appropriate answer. Opposite to the idea that firms are inert to adapt and thus, after an environmental change, only the appropriate organizational forms will fit the environment [e.g. Hannan and Freeman, 1989], some scholars believe that firms are able to transform and match the environmental change.

Despite a wide range of definitions of the concept of innovation, only in the 90's did strategic management scholars begin to speculate on a new concept of strategic innovation. Strategic management scholars like D'Aveni [1994, 1995, 1999] and Markides [1997, 1999a, 1999b and 2000] developed dynamic approaches to competition, moving from the widespread Porter's [1980] framework. According to these scholars the industry structure can be considered a dynamic environment that can be modified by companies' innovative strategies. The strategic innovator, thanks to industry transformation, can achieve a competitive advantage.

D'Aveni [1994] developed an original approach to industry structure analysis highlighting how firms are facing environments that are hypercompetitive. Such environments are highly changeable and even discontinuous, requiring organisations to respond flexibly and rapidly with innovative strategies. In the most hypercompetitive industries, competitors act boldly and aggressively to disrupt the status quo, forcing countermoves that are equally powerful.

The Hypercompetition perspective is based on the assumption that dynamic environments require proactive strategies. The process of Hypercompetition is essentially a process of creation of new strategies, whose final goal is to obtain the strategic supremacy.

Strategic supremacy can be associated with the concept of competitive advantage [Porter, 1985]: successful companies have a strategic supremacy that, *de facto*, determines a competitive advantage. Companies that want to develop a strategic supremacy are strategic innovators, in the sense that they can implement two new main strategies to modify the environment. They can operate to ignite *competence destroying processes* inside the industry or they can act to determine *competence enhancing turbulence*. Disrupters can destroy the competencies of an industry leader by changing the industry's critical success factors to make the leader's competencies obsolete, by using new technology and the know-how to establish a superior value-creation process. They can alter the definition of value and quality creating a superior value proposition. Competence enhancing strategies are based on acceleration of innovation developed on core competencies.

Disruptive/enhancing strategies are based on the ability of the firm to leverage on resources and competencies to generate innovation in products and processes. These innovations deliver more values to customers and/or bring more efficiency and establish a new competitive paradigm that became dominant in the industry until a new challenger or incumbent acts to modify the situation. The possibility for a competitor or an incumbent to establish a new paradigm clearly represents the outcome of an industry transformation process and highlights how, thanks to strategic choices, is possible to influence industry structure.

Markides [1997] moves from Porter's [1980, 1985] paradigm and builds a dynamic view of strategy based on the assumption that positioning has a central role in strategic processes. In every industry there are viable positions that a firm can occupy answering to the following questions: "*Who should I target as customers? What products or services should I offer them? How should I do this in an efficient way?"* Markides [1999: 56].

These questions involve a firm deciding which customers to focus on, which products to offer and which activities to perform. A successful firm must be able to choose a distinctive strategic position that differs from that of competitors. Strategy is all about choosing a distinctive (different from competitors) strategic position; in this perspective strategies are unique and they can be called "innovative" [Markides 1999].

Strategic innovation is not expressly related to the concept of technology innovation. Innovations in products or processes which involve technical aspects are not alone sufficient to stimulate strategic innovation. Furthermore, technical innovations can play an important role in the generation and implementation of strategic innovation. Strategy is all about choosing a distinctive (different from competitors) strategic position; in this perspective strategies are unique and they can be called "innovative" [Markides 1999].

A strategic innovator must be able to generate continuously new strategic positions that are unique. The process of strategic innovation generation takes the name of "creative positioning" and it related to the firm's ability to develop a set of resources that can sustain the adoption of new strategic position. These resources must be prepared in advance through the continuous monitoring of the competitive environment in order to understand what kind of resources can be useful according to the evolving environment. Competitors will try to imitate the strategy implemented by the strategic innovator and they will develop a set of resources that can help to sustain a new - innovative - strategic position. At the same time the innovator will generate further strategic innovation to preserve its competitive advantage. What is important in relation to industry structure evolution is that the strategy of the innovator will become a dominant strategy and will influence the rules of competition, forcing other companies to imitate it. And the more imitators will be, the more the strategic innovator will be pushed to generate new innovative strategies. This latter is clearly a reinforcing mechanism that has many similarities with the *"competitive escalation"* described by D'Aveni [1999].

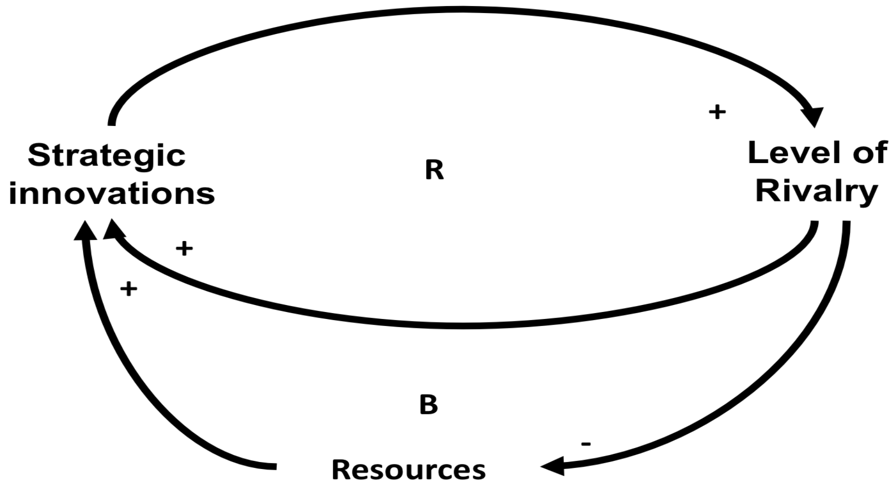
D'Aveni [1994] and Markides [1997] share the common idea that competitive advantage is related to the possession of a unique position that is different from competitor positions. A unique strategic position is a new position that is the result of a deliberate process of new positions generation conducted by the company, a "creative positioning" process [Markides, 1999] or a competence enhancing or competence destroying process to create a unique position [D'Aveni, 1994].

The competitive advantage that is generated through innovative strategies can transform the industry structure and in particular it can change the intensity of competitions, igniting competitive escalation [D'Aveni, 1994] or determining new competitive rules within the industry [Markides, 1997]. The deliberate modification of the intensity of competition is a dynamic process that has a number of effects on industry structure and, consequently, the modification of industry structures influences/requires that firms generate new innovative positions. The increased intensity forces competitors to imitate the innovator. This will cause the obsolescence of innovator competitive positions and the need to review it. This is a typical dynamic process, in which we can see a feedback relation that was well depicted by D'Aveni [1994] when he highlighted *"competitive escalation",* meaning that there is an amplification of the competition as happens with many phenomena in positive feedback loops.

D'Aveni [1994 and 1999] and Markides [1999a and 2000] adopt a perspective that can be defined *"resources based"*. The success of a strategy in a particular industry depends on the control of a set of resources. This set is destined to change according to the strategies implemented by the innovator. The resource perspective was underlined by Markides [1999]: when he analysed the process of strategic innovation he pointed out how the company must develop a set of resources that in some way can anticipate the evolution of industry. Furthermore, the idea that a dominant strategy developed by an innovator can be imitated by late entrants was confirmed by Cockburn, Henderson and Stern [2000]. They related the ability of the firm to generate new strategy and to the possession of a distinctive set of resources. Once the new strategy has been implemented followers quickly start to develop a set of resources to develop the successful strategy, so the innovator's original set of resources becomes obsolete and the company must renew it.

Strategic innovation is a dynamic process that is based on the possession of a set of resources and that produces durable effects on industry rivalry and on industry structure, in particular on industry's resource base and availability (Figure 1). Despite the fact that the effects of strategic innovation were investigated and that scholars show convergent ideas on industry modification, it remains largely unexplored how strategic innovation develops inside a firm. In particular two questions emerge*: What are the processes through which strategic innovation develops? What are the characteristics of the context in which innovative strategies arise?* We started to answer to these questions analysing selected contributions of the corporate entrepreneurship literature that tried to address the problem of strategy renewal in large firm connecting organizational innovation to the generation of new strategies.

Figure 1. A dynamic view of strategic positioning process



Entrepreneurial processes and strategic innovation

Studies on corporate entrepreneurship and in particular on internal corporate venturing - ICV - represent a powerful source of knowledge about the process of strategy renewal [Bower, 1970; Burgelman 1983, a and b; Block and Mac Millan, 1995]. During the 60's and 70's large diversified corporations were attempting corporate venturing programmes as a mean to renew their strategic position leveraging on innovative products and services.

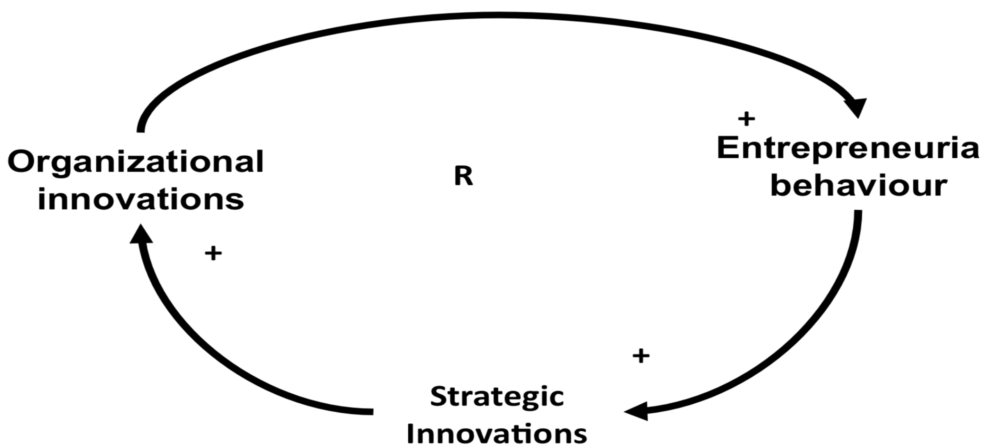
A strategic initiative such the introduction of new products can contribute to the development of new strategic paths that, in the end, can contribute to corporate strategy renewal. Burgelmann [1991] pointed out that the effectiveness of strategy renewal through internal venturing processes depends: on the availability of both induced and autonomous entrepreneurial activities on the part of front-line management, on the ability of middle-level managers to retain the implications of entrepreneurial initiatives and on the capacity of top managers to allow viable entrepreneurial initiatives to influence the corporate strategy.

According to Burgelman's process model of Internal Corporate Venturing [1983a, b and c, 1985] the generation, development and adoption of a strategic initiative is influenced by design of structural context. Structural context includes organisational and administrative mechanism put in place by top management to implement the current corporate strategy. The structural context operates as a selection mechanism on the strategic behaviour of middle-level management. The role of managers is to design the firm's structural context that is constituted by organisational structure and administrative systems such as, for example, information, rewards and incentive mechanisms. Administrative mechanisms influence the atmosphere in which the emergent strategic behaviour of front-line managers is shaped.

Top manager efforts should be devoted to design a firm's behavioural context moulding the smell

of the place, the company climate that is manifested in a thousand small details of how a company function, to foster co-operation and spread a *spirit of initiative* within the organisation. The context influences the actions of all those within the company. Top managers should achieve and manage, a certain level of entrepreneurial orientation (EO) among organization [Miller, 1983; Covin and Slevin, 1989 and 1991; Lumpkin and Dess, 1996].
In the innovative firms top managers design a structural context which is neither bureaucratic nor chaotic, but which is entrepreneurial and self-disciplined, where people co-operate, take initiatives and, while they are respectful of company basic values, are effective in achieving enterprise goals.
In such a context innovation generation processes take place and flow into the introduction of strategic initiatives that, if pass selection processes, are implemented and contribute to modify realised strategy and, consequently the behavioural context, enforcing its ability to foster further innovation. This "engine of innovation" is clearly a dynamic feedback (Figure 2) that is promoted and guided by top and senior managements' strategic intent to implement management practices fostering innovation.

Figure 2. Organizational innovation, entrepreneurial process and new strategies development



Modelling the processes of strategic innovation

Strategic innovation process is characterised by a dynamic behaviour over time and by the presence of feedback relations that can be captured only by adopting an approach that is focused on cause-effect circular relations rather then on relations between dependent and independent variables.
In particular the System Dynamics perspective allows us to investigate the feedback relations that exist between the renewal of strategy and managerial action implemented to modify the organizational context.
A further reason to adopt System Dynamics principles is that the process of strategic innovation develops through time and can be characterised by temporal delays and the presence of multiple inertias that are manifested through the development of strategic innovations.

Strategic initiatives, strategic innovations. Our model is based on two fundamental stocks: strategic initiatives and strategic innovations (Figure 3). Innovative firms are able to generate strategic innovations leveraging on creative positioning processes that can involve the development of new products, new markets, new distribution channels and new strategic business areas. The stock "strategic innovations" represent the new strategic positions that determine firm's better performance.

The creative positioning process Markides [1997] is feed by the integration into the strategy of the firm of strategic initiatives, that, as defined by corporate entrepreneurship scholars [Burgelman, 1983b], are innovative projects introduced by front-line managers autonomously or induced by top managers' strategic intent. Those projects concerns new products, process, distribution modality and can have a different degree of technological innovation content; the critical aspects of strategic initiatives is that they can potentially modify the strategic position of the firm.

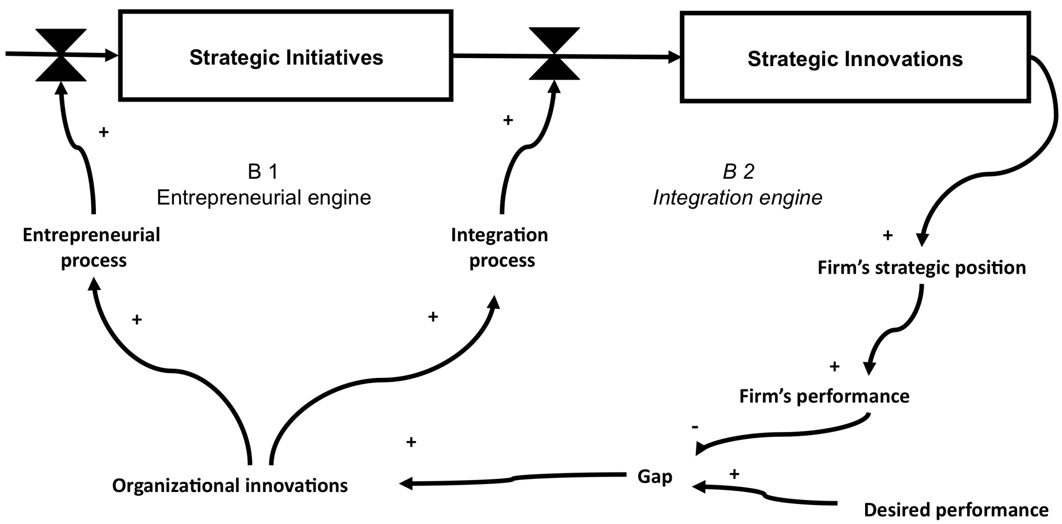
Organisational innovations to control entrepreneurial processes. In the model the emergence of new strategic initiatives is strictly related to the design of the organisational context [Covin and Slevin, 1989 and 1991]. Organisational context is characterised by a certain level of EO - entrepreneurial orientation that influences innovation processes.

Organisational innovations, which involve both soft and hard organisational variables, structure and processes, are typically finalised to instil bottom-up discipline and to release initiative capabilities in order to mould an organisational context which is entrepreneurial and disciplined at the same time.

The first goal of organisational innovation is to allow the release of the entrepreneurial energy embedded in the organisation, changing the entrepreneurial orientation of the firm. This energy is located in front-line managers that have a direct contact with firm's operations: procurement, production, deliver, after sales service [Burgelman, 1983 a and b;]. These managers act as engine for new initiatives, in particular they are the generators of new ideas. Organisational innovations act as a rate that regulate the emergence of new initiatives and can be activated to foster the emergence of innovative technical ideas as well as to slow it.

The second goal of organisational innovations is to integrate strategic initiatives into new strategic positions. These innovations can also be defined as "integrative" because, thanks to their introduction, new initiatives that are integrated into the company's corporate strategy and contribute to modify company's position. These organisational innovations typically include: the creation of new business units or organisational units to deliver new products and services, the introduction of new procedures for resources allocation to sustain innovation implementation on a large scale, the definition of criteria and processes to select new strategic initiatives. This *"integration process",* realised thanks to the introduction of specific organisational innovations, is a powerful means for balancing entrepreneurial energy, incorporated in the organisation, with a certain level of strategic discipline.

Figure 3. The dynamic of entrepreneurial process



<u>*Main feedback relations: entrepreneurial engine and integration engines.*</u> Strategic initiatives emergence and strategic integration process can be represented with two balancing loops that start from the perception of the existence of a gap between the actual performance of the firma and the desired performance. To close this gap top managers act igniting a process of strategic innovation and in particular they stimulate the emergence of strategic initiatives from the front line manager and integrate them into the firm's strategy.

The first feedback loop (Figure 3, B1) represents the entrepreneurial process described in corporate entrepreneurship studies [Burgleman, 1983a and b, Baden-Fuller and Stopford, 1994]. The redesign of the organisational structure and of administrative systems allows the increase of entrepreneurial orientation and the release of entrepreneurial energy embedded in the organisation. The polarity of feedback loop B1 (Figure 3) is negative. The increase of the level of organisational innovations finalized to release entrepreneurial energy allows proliferation of new initiatives that, once integrated in the corporate strategy of the firm, determines the renewal of corporate strategy. Once a sufficient number of innovative strategies has been successful introduced, the strategic positioning of the firm will be modified and the achievement of performance will stimulate managerial actions to reduce the entrepreneurial orientation.

Feedback loop B2 is regulated by the same logic that underpins the dynamic of feedback B1 (Figure 3). The loop represents the process of new ideas selection and retention through specific organizational innovations. Top managers have to select strategic initiatives that want to develop according to some organizational mechanism [Burgelman, 1885, 1994]. Then they have to introduce organisational innovations in the structure and/or in the mechanisms to create the right environment in which to accommodate new initiatives [Burgelman, 2002]. The polarity of this loop is negative. The introduction of organisational innovations to transform strategic initiatives in strategic innovations integrating them into the strategy of the firm will end once the desired level of performance (in terms of profitability, market share, revenues increase etc.) has been achieved.

<u>*The performance gap*</u>. Feedback loops B1 and B2 (Figure 3) describe a well know dynamic in

strategic management, however, alone they cannot explain why a firm decides to launch a process of strategic innovation, changing its entrepreneurial orientation to promote the emergence of strategic initiatives.

The answer to the question is to be found in the traditional competitive strategy approach [Porter, 1985]. Inside an industry the level of rivalry is largely determined by firms' ability to introduce new forms of positioning. Top managers observe the industry evolution process and decide to stimulate a process of strategy renewal based on strategic initiatives and strategic innovations. This is consistent also with studies on hypercompetition processes. According to D'Aveni [1994] stimuli to innovation come from the level of turbulence of the competitive environment.

The gap is the result of a process of perception of top managers that set a desired strategic position that is a goal to be reached stimulating the diffusion of entrepreneurial orientation inside the firm. The presence of the gap with an external target characterise the negative feedbacks. It will work until equilibrium has been reached between the desired strategic position and the actual position. The balancing loop will also act as a limit to growth for the strategic innovation processes. The stimulus to generate organisational innovations for top managers can vary according to different level of competitive pressure within the industry. The gap will progressively reduce until the firm reaches the optimal strategic position and this will reduce and eventually stop the introduction of organisational innovations to support entrepreneurial behaviour.

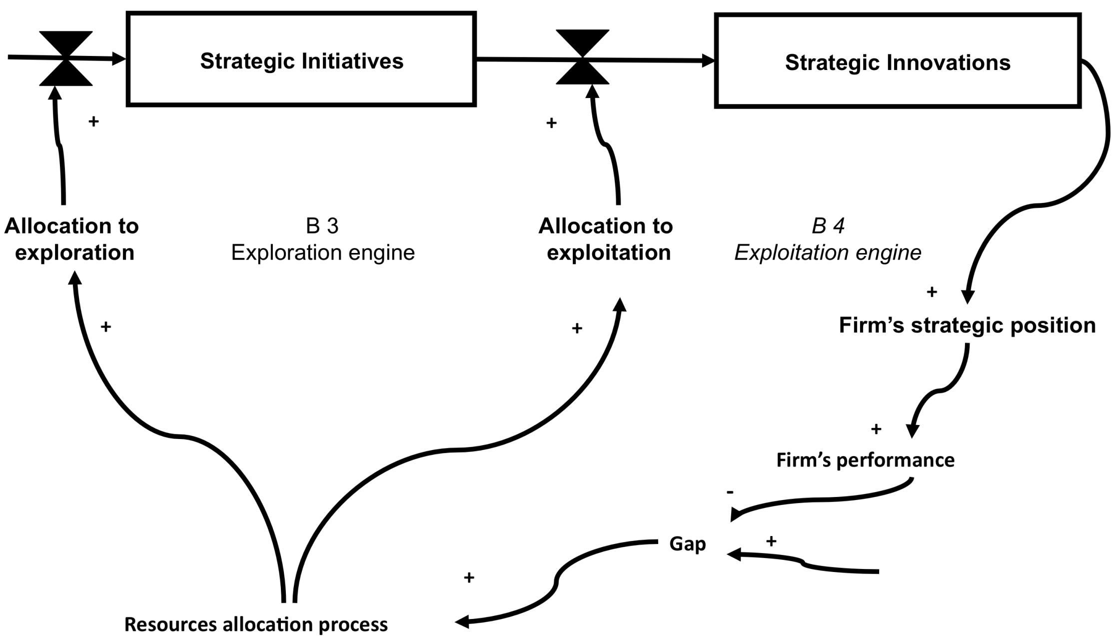
There are two considerations that must be made regarding gap dynamics. Firstly, according to the research findings of D'Aveni [1999] and Markides [2000], a company will never abandon its desire to introduce strategic innovations in current competitive environments, this will mean that every time the gap reaches its minimum value it will be opened again because the external competitive pressure sets higher goals in terms of performance.

The second consideration concerns the perception of the gap. The gap is influenced by management perception, and the perception of managers will be influenced by their mental models. Different top managers will appreciate in a different way the gap in terms of the generation of new positioning and consequently will act differently to reduce it. This point of the perception is particularly important and represents an innovative feature of our model. D'Aveni [1994, 1996] highlighted how firms react instantaneously to changes in the competitive environment by launching competitive escalation. In our model the creative positioning process and its intensity are strongly influenced by top management's perception. This means that top managers don't react instantaneously to external stimuli. For example conservative top managers, due to their mental model, can have difficulties in appreciating the necessity of innovate positioning and will be induced to respond slowly to environment modifications.

Resources dynamics in strategic innovation processes

Organizational innovations are important to ignite and control strategy renewal process however strategic initiatives can hardly be presented (by front-line managers) and developed without appropriate amount of resources. Furthermore strategic initiatives can be integrated into the strategy of the firm if they receive an appropriate resource commitment. Resources can be tangible like money, production plans and intangible, like knowledge.

Figure 4. The dynamic of resource allocation process



Resource portfolio should be managed by top managers achieving a complex equilibrium between exploration activities, that lead to generation of strategic initiatives and exploitation activities that lead to the development of new forms of positioning (Figure 4, feedback loops B3 and B4).

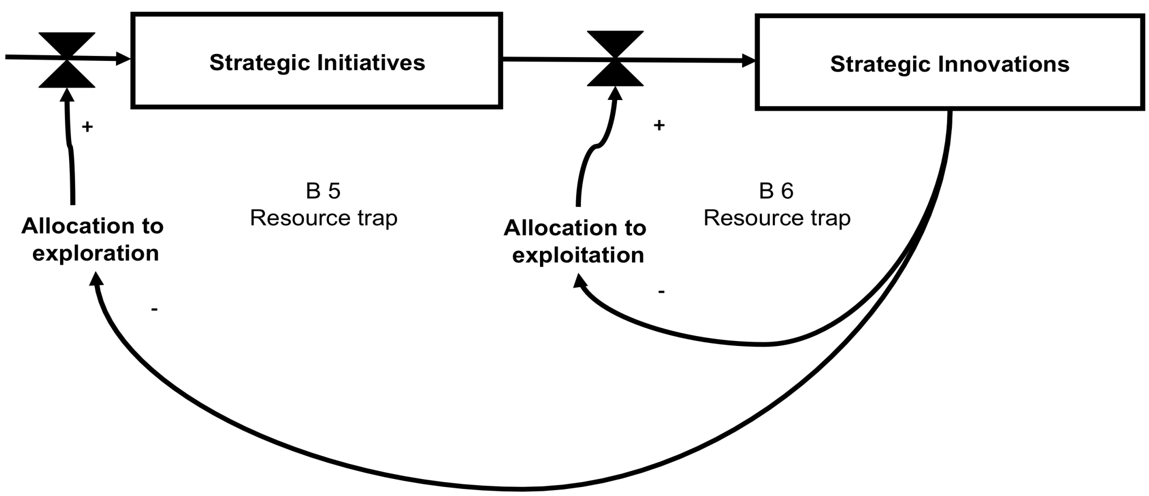
Scholars state from one hand that the balance is achieved through punctuated equilibrium, that is the temporal allocation of resources between exploration and exploitation [Levinthal and March, 1993, Siggelkow and Levinthal, 2003; Tushman and Romanelli, 1985; Vermeulen and Barkema, 2001]. According to D'Aveni [1999] under certain competitive conditions firms have only one pattern of behaviour to generate new strategies and to survive. For this reason it possible to argue that under certain conditions, for example under an increasing external competitive pressure, firms should privilege exploration and face new entrants.

From the other hand, some scholars state that organizations should be ambidextrous, pursuing concurrently both exploration and exploitation [Benner an Tushman, 2003; Burgelman, 1991; Christensen, 1998; Levinthal, 1997]. Ambidextrous organizations are usually composed by small and decentralized exploratory units and larger and more centralized exploitative ones [Benner and Tushman, 2003]. Several studies present empirical evidence that simultaneous interaction between the exploration and exploitation is positively related with firm performance [e.g. He and Wong, 2004; Katila and Ahuja, 2002]. From those considerations emerges that top managers should dedicate equal efforts in fostering the development of new strategic initiatives and in translating it into new strategies.

Burgelman [2002] suggests that firm should alternate longer period of exploitation with short stages of exploration, this suggests that exploration and exploitation are two processes that can be conducted according to a precise sequence, eventually repeated through the time (the firm's life).

Despite choices in terms of balancing and the temporal sequence of exploration and exploitation top manager will face the moderating effect of the so called "resource trap balancing loop" (Figure 5, feedback loops B5 and B6). Resource allocation process can be influenced by the so called core rigidities [Leonard-Burton, 1992; Repenning, N. and J. Sterman, 2002] that emerges from resource accumulation process. The more strategic innovations will be developed and will cumulate in the strategic innovation stock, the less will be the willingness of top managers to commit further resources to the presentation and development of new strategic initiatives. This will not affect the short term ability of the firm to renew its strategy because it can count on a pipeline of strategic initiatives that are under development. However in the long run the firm will experience discontinuities in the strategic initiatives flow that could jeopardize the ability to renew its strategy.

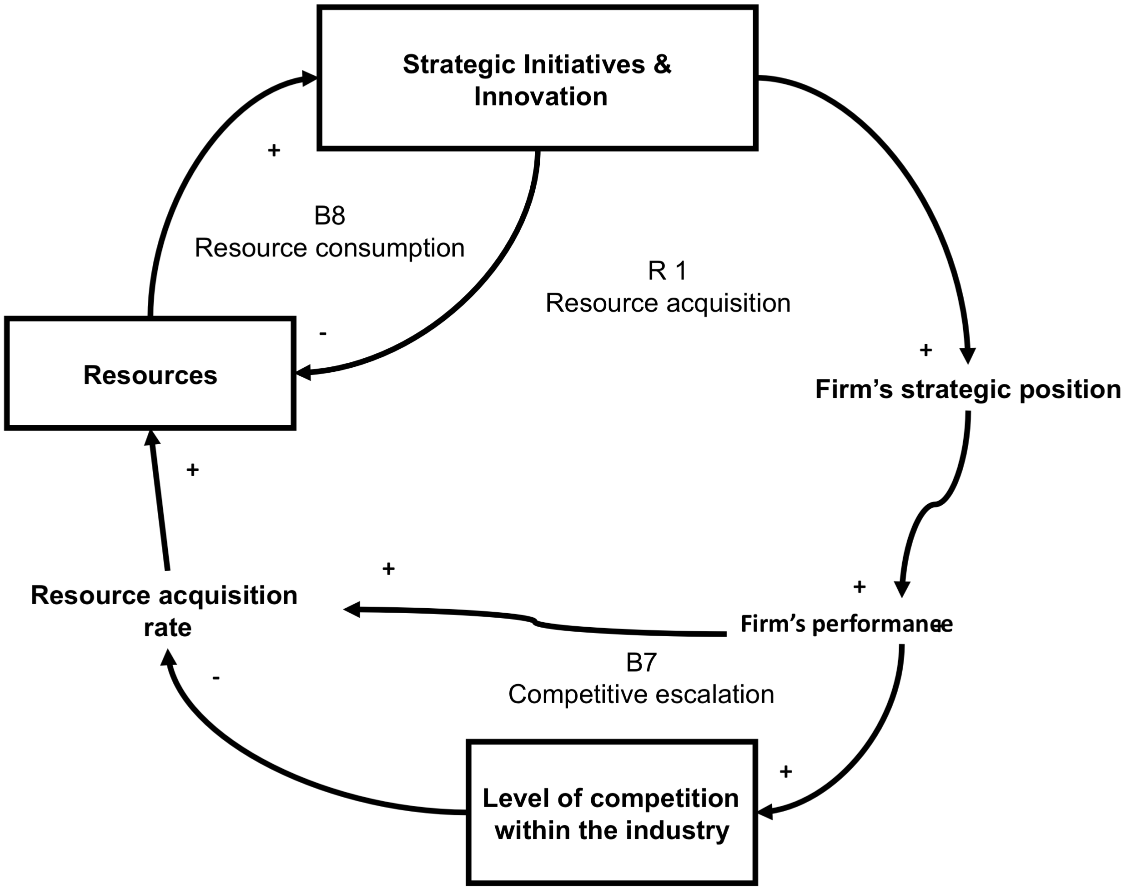
Figure 5. Resource trap



Resources are absorbed by strategic initiatives and generated through time thanks to company performance, in particular profitability, and are the result of complex process of accumulation. Resource accumulation process has been widely investigated in the management literature [Teece et al., 1997] and can be represented as positive feedback for which the availability of resources sustains the implementation of innovative strategies that contributes to obtain better performances (Figure 6, feedback loop R1).

Resource availability is deeply influenced by the characteristics of the competitive environment, in particular the competition level will increase in competitive environment in which firms introduce simultaneously or sequentially new strategies [D'Aveni, 1995]. In such environment a balancing loop (Figure 6 feedback loop B7) could explain how critical resources decrease and why competitive escalation process slow down to a condition of market stability.

Figure 6. Resource absorption and acquisition



Conclusions

The model shows an internally consistent representation of strategic innovation process in which top managers are stimulated to act to change the strategy of the firm from the evolution of competitive environment. The model evidences the presence of two distinct managerial dynamics. The first is related to organisational innovations that are introduced to ignite entrepreneurial process that is essential to generate strategic initiatives leveraging on front-line managers knowledge. The second dynamic depicts the integration efforts of top management and it is related to other forms of organizational innovation introduced to select and integrate strategic initiatives. Both feedback loops are negative and characterised by the presence of temporal delays for which a managerial actions introduced to stimulate strategic innovation will not produce immediate effects. Strategic initiatives pass through two different stocks before they can contribute to renew firm's strategic position and this process will take a certain amount of time. During this process top managers should monitor the strategic initiatives flow to maintain an appropriate balance between activities made to stimulate entrepreneurial behaviour among front-line mangers and activities implemented to integrate strategic initiatives. If top mangers concentrate their efforts only on increasing the entrepreneurial orientation they will obtain a large amount of strategic initiatives that will be hardly be processed and integrated in the strategy of the firm.

The model's managerial implications must be found first of all in the area of resource allocation decisions. Resource dynamic plays a critical role in strategy renewal process. Resources are limited and cannot be concentred only to stimulate strategic initiatives presentation or, on the contrary to support the full development and integration of those initiatives. Top managers have to optimize resource allocation and should consider that, in hypercompetitive environments in which a relevant number of firms implement innovative strategies the access to critical resources become problematic.

A second set of managerial implications concern the introduction of organisational innovations. It is essential for top managers to control the quality of integration process rather than to simply stimulate a relevant flow of innovations through entrepreneurial orientation. Only by controlling the quality at different stages and during the integration phase can top managers assure a successful strategic renewal process.

A further relevant managerial implication concerns the design and management of control system, in particular those systems that produce information for the top management. Strategic innovation process starts only if top manager can recognize and evaluate competitive environment evolution, for this they need an appropriate flow of information on competitive dynamics, incumbents, new entrants and other factors as demand evolution and economic trends. Internal information are the other side of the medal, top managers have to monitor the state of development of strategic initiatives. Internal information will guide top managers in the introduction of organizational innovations to control the flow of strategic initiatives and will determine the optimal resource allocation between exploration and exploitation activities.

References

Andrews, K. R. [1971]. The concept of corporate strategy, Irwin, Homewood, IL.

Baden-Fuller, C., and Pitt, M. [1995]. Strategic innovation. Routledge. London.

Baden-Fuller, C.W. and J. Stopford [1994]. 'Creating Corporate Entrepreneurship'. Strategic Management Journal, vol. 15, 521-536.

Benner, M. J. and Tushman, M. L. [2003]. Exploitation, exploration, and processmanagement: the productivity dilemma revisited. Academy of Management Review, 2: 238–256.

Block, Z., and MacMillan, I.C. [1995]. Corporate Venturing: Creating New Businesses within the Firm. Harvard Business School Press, Boston, MA.

Bower, J. L. [1970]. Managing the resource allocation process. Harvard University Press, Boston MA.

Burgelman, R.A. [1983a]. 'A process model of internal corporate venturing in the diversified major firms'. Administrative Science Quarterly, 28, pp.223-244, 1983a.

Burgelman, R.A. [1983b]. 'Corporate entrepreneurship and strategic management: insights from a process study'. Management Science, Vol. 29, pp.1349-1364.

Burgelman, R.A. [1983c]. 'A model of interaction of strategic behaviour, corporate context, and the concept of strategy'. Academy of Management Review, Vol. 8, No. 1, 61-70.

Burgelman, R.A. [1984]. 'Desigs for corporate entrepreneurship'. California Management Review, Vol. 26, No. 2: 154-166.

Burgelman, R.A. [1985]. 'Managing the new venture division: Research findings and implications for strategic management'. Strategic Management Journal, 6:38-54.

Burgelman, R.A. [1991]. 'Intraorganisational ecology of strategy making and organisational adaptation: theory and field research'. Organisation Science, 2:239-262.

Burgelman, R.A. [1994]. 'Fading memories: A process theory of strategic business exit in dynamic environments'. Administrative Science Quarterly, Vol.39: 24-56.

Burgelman, R.A. [2002]. Strategy is destiny. The Free Press, New York.

Christensen, C. M. [1998]. The innovator's dilemma. Harvard Business School Press. Boston Cockburn, J.K, Henderson, R.M. and S. Stern [2000]. 'Untangling the Origins of Competitive Advantage'. Strategic Management Journal, Vol. 21, No. 10-11: 1123-1145.

Covin, J. G. and Slevin D. P. [1989]. 'Strategic management of small firms in hostile and benign environments'. Strategic management Journal, 10: 75-87.

Covin, J. G. and Slevin D. P. [1991]. 'A conceptual model of entrepreneurship firm behaviour'. Entrepreneurship: theory and practice; Vol. 16, No.1: 7-24.

D'Aveni, R. A.[1994]. Hypercompetition. The Free Press, New York.

D'Aveni, R. A. [1995]. Hypercompetitive Rivalries. The Free Press, New York.

D'Aveni, R.A. [1999]. 'Strategic Supremacy Through Disruption and Dominance'. Sloan Management Review, Vol. 40, No. 3.

Forrester, J. W. [1961]. Industrial Dynamics. Productivity Press, Cambridge, MA.

Forrester, J. W. [1968]. Principles of Systems; Productivity Press. Cambridge, MA.

Hannan, M.T. and Freeman, J., [1989]. Setting the record straight on organizational ecology: Rebuttal to Young. American Journal of Sociology, 95: 425-439.

He, Z. and Wong, P. [2004]. Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. Organization Science, 15: 481-494.

Katila, R., and Ahuja, G. [2002]. Something old, something new: A longitudinal study of search behaviour and new product introduction. Academy of Management Journal, 45: 1183–1194.

Leonard Burton, D. [1992]. Core capabilities and core rigidities: A Paradox in Managing New. Product Development. Strategic Management Journal, 13:11-125.

Levinthal, D. A., and March, J. G. [1993]. The myopia of learning. Strategic Management Journal, 14 [special issue]: 95–112.

Levinthal, D. A. [1997]. Adaptation on rugged landscapes. Management Science, 43: 377–415.

Lumpkin, G. T., & Dess, G. G. [1996]. 'Clarifying the entrepreneurial orientation construct and linking it to performance'. Academy of Management Review, 21: 135–172.

Markides, C.C. [1997]. 'Strategic Innovation'. Sloan Management Review, vol. 38: 9-23.

Markides, C.C. [1999a] 'Strategic Innovation in Established Companies'. Sloan Management Review, vol. 39: 31-42.

Markides, C.C. [1999b]. 'A dynamic view of strategy'. Sloan Management Review, volume 40, pp. 55-63.

Markides, C.C. [2000]. All The Rights Moves, HBS Press, Cambridge, MA.

Meadows, D.L. [1970]. Dynamics of Commodity Production Cycles. Productivity Press, Cambridge, MA

Miller, D. [1983]. 'The correlates of entrepreneurship in three types of firms'. Management Science, 29: 770-791.

Porter, M.E. [1980]. Competitive Strategy: Techniques for Analyzing Industries and Competitors. The Free Press, New York.

Porter, M.E. [1985]. Competitive Advantage. The Free Press, New York.

Porter, M. E. [1996]. 'What is Strategy ?'. Harvard Business Review, November-December 1996, p. 61-78, 1996.

Repenning, N. and J. Sterman (2002). Capability Traps and Self-Confirming Attribution Errors in the Dynamics of Process Improvement, Administrative Science Quarterly, 47: 265 - 295.

Repenning, N. (2002). A Simulation-Based Approach to Understanding the Dynamics of Innovation Implementation, Organization Science, 13, 2: 109-127.

Siggelkow, N., and Levinthal, D. A. [2003]. Temporarily divide to conquer: Centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. Organization Science, 14:650–669.

Sterman, J.D. [2000]. Business Dynamics. McGraw-Hill, New York.

Teece, D.J., Pisano, G. e Shuen, A. [1997]. Dynamic capabilities and strategic management, Strategic Management Journal, 18, 7, pp. 509-533.

Tushman, M.L., Romanelli, E. [1985]. Organizational Evolution: A Metamorphosis model of convergence and riorientation. In Cummings, L.L., Staw, B.M., [eds.], Research in Organizational Behavior, 7: 177-222. JAI Press: Greenwich, CT.

Vermeulen, F., and Barkema, H. [2001]. Learning through acquisitions. Academy of Management Journal, 44:457–478.