

INNOVATING, LEARNING AND INTERNATIONALIZING: A MUTUAL CAUSALITY MODEL

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Abstract

The literature on organizational learning, innovation and internationalization usually views these three processes as building upon each other. In this paper, however, we aim to clarify these relationships and propose a theoretical model that has mutual causality at its core and is based on ideas originating in complexity theory. Our model results from case study research into two clothing sector firms. We view innovation in knowledge, products and processes as well as expanding into new markets, as processes that reinforce each other, and which as a whole constitute a system. Furthermore, we propose two distinct paradigms or stages for understanding these relationships: the incremental and the global. The former views adaptive learning, incremental innovation and low-level internationalization as being interlinked. The latter considers generative learning, radical innovation and global internationalization as supporting one another. The paper ends in an exploration of the academic and management implications of our model.

Keywords: organizational learning, innovation, internationalization, complex adaptive systems.

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Introduction

Organizational learning, innovation and internationalization are key ingredients for the knowledge-based economy in the age of globalization. As we leave behind an industrial age which had the transformation of raw materials into finished goods at its core, we enter the age of the creative knowledge-based society, in which organizations must continually break down mental and physical barriers, in order to innovate, learn and internationalize.

Organizational learning, innovation and internationalization are usually dealt with by looking into diversity and complexity, and by applying a holistic approach. The traditional reductionist paradigm (Dent 1999), however, makes solutions hard to come by. These concepts may require moving beyond linear causality, reductionism and determinism, to adopt a new, more complex and holistic, paradigm. This new paradigm is based on a world view characterized by certain epistemological and ontological beliefs such as holism and mutual causality (Dent and Powley 2004; Begun 1994; Capra 1993; Wheatley 1992); it serves as an umbrella for a number of ideas, theories and research programmes derived from various scientific disciplines, such as complex adaptive systems, chaos theory, wholeness theory, dissipative structures, fractals etc. (Burnes 2005: 73).

We believe that the concept of complex adaptive system may be a useful starting point for understanding the way organizational learning, innovation and internationalization interact, for it stresses the importance of interconnections and mutual adaptability. Complex adaptive systems are being used increasingly by academics and practitioners as a way of understanding organizations (Burnes 2005; Antonacopoulou and Chiva 2007; Chiva et al. 2010). They are made up of heterogeneous elements that interrelate with one another and with their surroundings. They learn rapidly from experience, adapting their behaviour to prevailing circumstances. (Gell-Mann 1994; Coleman 1999; Anderson 1999; Axelrod and Cohen 1999; Houchin and MacLean 2005). Their complexity resides in their diversity, as they are made up of multiple interconnected elements. Their adaptable nature relating to their capacity to change and learn from experience. Adaptability is a system's capacity to adjust to changes in the environment without endangering its core organizational features. Complex systems, however, may also undergo changes that involve modifying these core organizational traits (Jantsch 1980); this leads to the creation of a new reality. Consequently, Chiva et al. (2010) distinguish between complex adaptive systems and complex generative systems. The former being associated with self-organization, adaptive learning, incremental innovation and explicate order; while the latter relates to self-transcendence, generative learning, radical innovation and implicate order.

In recent years, the literature on internationalization, organizational learning and innovation has been trying to link these three concepts through linear causality (see, for example, Buckley and Casson 1976; Wagner 1995; Molero 1998; Mañez et al. 2004;

Alegre and Chiva 2008). Linear causality involves thinking in terms of cause and effect, which is appropriate when the situation and concepts are simple and straightforward. However, organizational concepts and events are increasingly complex, which makes linear causality too simple a framework for dealing with them. If research has found each of these concepts to be explained by another, it may be preferable to understand them as being totally interrelated or linked by mutual, reciprocal or circular causality. The goal of studying circular causality is not to find out where everything started, but how these relationships work. We therefore need a conceptual framework to comprehend them.

The purpose of this paper is to analyse how these three concepts relate to each other and to present a conceptual framework that allows us to grasp these interactions. We will focus on three distinct areas: firstly, we review the existing literature on the subject; secondly we present our analysis of our two Spanish clothing industry case; and thirdly we will apply complexity theory in order to develop a model for dealing with these relationships. Hence, our contribution is based on a mutual causality framework, with complex adaptive and generative systems ideas playing a key role for understanding the way organizational learning, innovation and internationalization relate to one another. This will lead us to our conclusion that the three processes constitute a complex system that may be adaptive or generative.

In order to introduce our model, we shall briefly discuss how the existing literature deals with each of our three subjects. We will subsequently present our analysis of two organizations as case studies. Next, we will propose a model, and advance the two system levels or stages it contemplates: the incremental or adaptive and the global or generative. Finally, we discuss the implications of our framework.

Organizational Learning, Innovation and Internationalization: A Brief Review

In this section, we briefly review the literature on the relationships between the three concepts: organizational learning, innovation and internationalization. As linear causality has usually been the framework used, we divide the section into three parts, depending on which issue is supposed to be the cause of the other two.

Organizational Learning: New knowledge affects innovation and internationalization

Organizational learning has for some time been one of the concepts most strongly in demand in the academic and business worlds (Bapuji and Crossan 2004; Easterby-Smith et al. 2000). In spite of its complexity, reflected in the numerous perspectives proposed (Chiva and Alegre 2005), organizational learning can be defined as the process through which organizations change or modify their mental models, rules, processes or knowledge, maintaining or improving their performance (Argyris and Schon 1978; Senge 1990; Brown and Duguid 1991, Dibella et al. 1996). Organizational learning is, then, a process that develops a new way of seeing things or understanding them within

organizations, which implies new organizational knowledge. According to literature (Chiva and Alegre 2009; Goh and Richards 1997), organizational learning can be fostered through several organizational and managerial factors like: experimentation, risk taking, dialogue, interaction with the external environment and participation (Chiva and Alegre 2009).

Organizational learning has been identified as key factor for achieving competitive advantage in dynamic and turbulent markets (Slater and Narver 1995; Hult 1998). Previous research has linked organizational learning to important competitive issues such as market orientation (Baker and Sinkula 1999; Slater and Narver 1995) – which has traditionally related to internationalization (Leelapanyalert and Ghauri 2007) – innovation (McKee 1992; Hurley and Hult 1998), and company performance (Calantone Cavusgil and Zhao 2002; Hult et al. 2004).

Furthermore, literature on innovation and internationalization has stressed the importance of knowledge in order to develop processes. Innovation is defined by Afuah (1998) as new knowledge incorporated into products, processes, and services. In fact, a great deal of research has considered new knowledge as the basis for innovation (see, for example, Nonaka and Takeuchi 1995; Alegre and Chiva 2008), understanding innovation as an individual and collective learning process that aims to seek new ways of solving problems. Innovation seems to depend on the company's capability to learn through which new knowledge is developed, distributed and used. Perhaps due to the importance of knowledge in the innovation process, this seems to stress the existence of two main stages: firstly, the generation and development of an idea or concept (new knowledge), based on identification of the needs or opportunities, which is labelled Fuzzy Front End (Reid and Brentani 2004; Khurana and Rosenthal 1998); and secondly, the implementation or execution of these concepts or ideas, which normally includes design, production and launch (Perks et al. 2005).

On the other hand, internationalization is considered by several authors (Bilkey and Tesar 1977; Andersen 1993; Prashantam 2005) as a kind of innovation, and therefore knowledge also plays a vital role. In fact, Prashantam (2005) states that knowledge is at the core of received wisdom on internationalization, which is consistent with the notion that internationalization represents an innovation by the firm. Learning might also be understood as an input of the internationalization process (Petersen et al. 2008). This is supported by the internationalization process view (Johanson and Vahlne 1977; 1990) and the need to close perceived gaps in knowledge of foreign markets (Petersen et al. 2008). From this perspective, internationalization is viewed as a learning and knowledge accumulation process (Ling-yee 2004). Learning alters the way in which firms see and interpret the world; organizational routines and procedures based on experience therefore drive firms' internationalization sequentially. As internationalization is trial-and-error based and firms have imperfect knowledge of the institutions and customers in the foreign market, knowledge of both is accumulated by conducting international operations. This accumulated knowledge drives internationalization and improves a firm's capacities to monitor and collect information. This new knowledge is assimilated into the firm's existing knowledge. Confrontation, questioning and reconsideration occur, and double-loop learning may emerge (Erikson et al. 2000).

In summary, when organizations have developed or created new knowledge, this might have effects on innovation and internationalization. Based on new knowledge, organizations can implement a new product, service or process and tackle a new country market. According to De Clercq et al. (2005), the more knowledge a firm has gained through intensive learning efforts, the more willing it will be to utilize and exploit this knowledge through subsequent international activity.

Innovation: New Products and processes affect organizational learning and internationalization

Innovation is also a concept that has taken on increasing importance in the academic and practical worlds over the last few years. Urabe (1988) defines innovation as the generation of a new idea and its implementation in a new product, service or process. Thompson (1965) considers innovation as a broader concept that addresses the implementation of new ideas, products or processes.

Generally, literature claims a positive relationship between innovation and internationalization (see, for example, Wakelin 1998; Molero 1998; Basile 2001; Pla-Barber and Alegre 2007; Mañez et al. 2004) mainly because innovation confers market power and, as a consequence, facilitates internationalization (Roper and Love 2002). Innovative firms obtain some competitive advantages that give them the chance to compete actively in different markets (Lopez and García 2005; Filipescu 2007). Furthermore, the international business literature proposes that internationalization depends on structural factors of the firm, management factors, and incentives and obstacles in the internationalization process (Bonaccorsi 1992). Innovation capacity can be considered as an essential factor in facilitating internationalization.

Innovation management literature generally predicts that innovative firms will have a tendency to enter foreign markets in order to increase sales volume and spread the fixed costs of innovation over a larger number of units (Tidd et al. 1997; Rogers 2004). Apart from some exceptions (Lefebvre et al. 1998; Becchetti and Rossi 2000), previous research is quite consistent in supporting the idea that innovation encourages internationalization.

On the other hand, innovation can be also be viewed as a catalyser of new knowledge, as the very process and the feedback of the successful or unsuccessful consequences can lead to a new vision of the market, the product etc. (Hurley and Hult 1998). In summary, innovation might also be considered as the source of internationalization and organizational learning.

Internationalization: New country markets affect organizational learning and innovation

The increasing engagement of firms in international activities is now one of the most visible responses to the constantly changing dynamics of the global environment (Buckley and Ghauri 2004). According to Prashantam (2005), internationalization is

commonly understood as the process of adapting firms' operations to international environments (Calof and Beamish 1995: 116). Prashantam (2005) states that internationalization is an important issue for firms that often results in vital growth (Luostarinen 1980), useful learning outcomes (Zahra et al. 2000) and enhanced financial performance (Lu and Beamish 2001). We can consider that internationalization implies entering into new country markets (Filipescu 2007), and can be broadly defined as 'expanding across country borders into geographic locations that are new to the firm' (Hitt et al. 1994: 298) or 'a process of increasing involvement in international operations' (Welch and Luostarinen 1999: 84).

Hitt et al. (1994) state that internationalization not only allows a firm to enrich its sources of knowledge, it also provides the opportunity to capture ideas from a greater number of new and different markets, as well as from a wide range of cultural perspectives, which facilitates innovation. Thus, they emphasized that highly internationalized firms can improve their ability to innovate by having greater opportunities to learn (Kafouros et al. 2008; Nooteboom 2000). Furthermore, Kotabe et al. (2002) state that internationalization can reduce costs associated with innovation: highly internationalized firms can access many markets around the globe, they can buy materials and R&D inputs from the cheapest available sources, and locate their R&D and other departments in the most productive regions (Kafouros et al. 2008). Internationalization can also improve the ability to innovate by allowing firms to hire better technologists and access skilled technical expertise (Cheng and Bolon 1993, Kafouros et al. 2008). On the other hand, being more international allows a firm to achieve greater returns from innovation by utilizing many markets (Hitt et al. 1997; Kafouros et al. 2008). Several authors (Kumar and Saqib 1996; Buesa and Molero 1998) understand that firms' international activity is one of the main determinants of regularity in innovation.

Internationalization has been increasingly related to organizational learning and knowledge (Forsgren 2002; Zou and Ghauri 2008). A lot of research has considered that internationalization provides organizations with different experiences that make them learn or develop new knowledge (Sullivan 1994; Hitt et al. 1997; Gomes and Ramaswamy 1999). In fact, some of these papers have also considered that internationalization creates new knowledge, which encourages them to innovate (Wagner 1995; Pittiglio et al. 2009). Pittiglio et al. (2009) consider that firms active in international markets generate more knowledge than their counterparts that sell only in the national market, because the former learn more from external sources. Along the same lines, Keeble et al. (1998) consider that internationalization is a very important process underpinning firms' innovative activities. Criscuolo et al. (2005) and Wagner (2001) demonstrated that international firms innovate more thanks to access to a greater flow of ideas from external sources.

The Case Studies

Given our research objectives, a qualitative method based on case studies seems to us the most appropriate. This is mainly because we seek to answer 'how' and 'why' questions. Furthermore, case studies allow us to obtain detailed descriptions of

processes when holistic perspectives are required (Crespin-Mazet and Ghauri 2007; Gummesson 2000; Lincoln and Guba 2000).

In order to analyse the way these processes interact we compare two different Spanish clothing companies. We deliberately selected these two cases because of their contrasting outcomes (Yin 2003; Ghauri and Grønhaug 2005), as well as their richness and complexity. Case study analysis stresses the idea that the three concepts are interrelated and causality is difficult to establish. However, Marie Claire and Mango present different approaches and their results are quite different.

Data was collected through semi-structured interviews with innovation, learning and internationalization managers. We also analysed secondary data to enable data triangulation (Ghauri 2004; Crespin-Mazet and Ghauri 2007). Six two-hour interviews with innovation, internationalization and human resources managers were held (three per company), allowing us to understand both companies' approaches to our concepts. Each interview was recorded and fully transcribed. We then carried compared both cases systematically by means of qualitative analysis. We summarized the characteristics of each case in a table (Table 1) which allowed for cross comparison (Miles and Huberman 1994; Crespin-Mazet and Ghauri 2007).

Table 1. The case studies

	Marie Claire S.A.	Mango S.A.
Some data (approx.)	Created in 1907. 850 employees. 30% revenues come from abroad. Exports to 40 countries.	Created in 1984. 6500 employees. 75% revenues come from abroad. Exports to 90 countries.
Organizational learning → innovation and internationalization	Although they try to improve products, processes and ideas; they avoid taking risks. The company is not characterized by high participation and teamwork.	Creativity, humbleness, cultural diversity, experimentation and participation foster learning and bring about innovation and internationalization
Innovation → organizational learning and internationalization	Innovations, most of them incremental, are introduced first in the local market with the company's own brands and then to the international markets through generic brands. Internationalization makes innovation profitable. Innovation enables learning on markets and products.	TIC and design innovations are considered to be essential to develop globalization and learning. Innovations confer market power and allow them to internationalize.
Internationalization → organizational learning and innovation	The London subsidiary is considered to be strategic as important ideas come from there.	Internationalization allows Mango to access many markets and to purchase the better materials and R&D inputs at the best prices. Internationalization required a multinational workforce.

Marie Claire S.A.

Marie Claire S.A. was set up in 1907 as a stockings and tights manufacturer and marketer. In 1975, after several decades of successful activity, the company decided to diversify into the sock business. In 1985, following a vertical integration strategy, the firm started doing its own spinning and producing synthetic garments. Nowadays, it also produces pyjamas, linen or lingerie.

Marie Claire S.A. markets its products through its own brands: Marie Claire, Kler Cherie and One. However, they also produce generic brands for supermarkets and large retailers in Spain, Holland, Belgium, France, England, Portugal and Greece. Over time, Marie Claire has become the largest supplier of generic brand stockings, tights and socks in the Spanish market. Furthermore, they also supply some important Spanish brands such as Agatha Ruiz de la Prada or Kukuxumusu.

Marie Claire is currently large both in Spain and abroad, exporting to nearly 40 countries; it has 850 employees and its revenues reached € 90 million in 2009. Its HQ is in Castellón (Spain), where there are two factories. Its logistics allows the company to supply the south of Europe. Marie Claire also has a branch in London from which distribution to the north of Europe is managed, the United Kingdom being considered a strategic market. The London branch also plays an important role in generating new ideas for products.

According to the managers, innovation focuses mainly on the company's core products: stockings, tights and socks. The innovation manager stated: 'We try either to apply innovations we see in the market, (incremental innovation), or to develop new products based on technological improvements (radical innovation), like tights that avoid runs or socks that do not stink'. The latter innovations represent only 1% of the company's total number of stockings, tights and sock products. Most innovations are incremental arising from adapting, learning or improving with what it is already on the market.

New ideas originate in suppliers, salespeople and production, as well as and from the English subsidiary. However, most of them come from the Innovation Department, which works continuously on new concepts and technologies. Knowledge management is, thus, essential in this area. According to the interviewees, working closely with suppliers is also very important for innovation. Marie Claire, however, is not an innovative company where everyone participates, teamwork is ubiquitous and experimentation actively promoted. This is only the case in the innovation department, which in spite of a strong emphasis on experimentation also stresses that mistakes cannot be accepted. Risk perception seems to be everywhere. The result is that only few new products are developed every year and radical innovations are only supported when 'it is clearly obvious that customers are going to accept the new product'. According to the innovation manager 'we cannot take any risks; innovations have to be always successful. Innovations make us learn and probably allow us to internationalize'.

Innovative products are marketed firstly in Spain through the company brands (Kler etc.), and only after that are they made available to customers abroad, the department stores. If they are interested, Marie Claire develops products for their generic brands.

When asked why they do not try to market their new products in all these countries through their own brands, managers answered that it is very difficult to develop a well-known brand and to be successful with it internationally. So, the company seems lacking in confidence regarding its chances of competing abroad. The internationalization manager told us: 'we use the international market to increase sales volume and spread the fixed costs of innovations'.

They began exporting fifteen years ago, with agents, and direct selling to customers as their main entry routes, and started importing merely seven years ago. Currently, 30% of their revenues come from abroad, which makes Marie Claire a partially internationalized company. According to the Internationalization manager, the London office is the only visible sign of the international drive of the company. A few years ago they had to close up two offices in Holland and Poland, and this failure might have made the company halt its expansion overseas.

In sum, Marie Claire is characterized by a focus on incremental innovation and adaptive learning, some bad experiences abroad, lack of confidence in the chances of their brand and products in the international market, a focus on the local market and brand, and use of the international one to recover investments in innovation. Thus, innovation, internationalization and learning appear to be closely related and it is difficult to determine which the initial catalyser is. Furthermore, incremental innovation and a low degree of organizational learning and internationalization go hand in hand in this case.

Mango S.A.

Mango S.A. is a Spanish clothing company focused on designing and marketing clothes and accessories for women, with distribution carried out through its own chain of retail stores Mango/MNG. Mango aims to dress young, modern, urban, sophisticated, professional and independent women, following trends and offering mid- to high-quality products at affordable prices. According to its managers, their products are exclusive, with few items for each kind of product, and heavy investment in design and quality.

Mango does not manufacture its clothes; over 75% of products are subcontracted in Asia and North Africa, with 60% being supplied by 50 Chinese companies to which they have a close relationship. Internationalization allows Mango to tap a vast array of markets and to purchase the best materials and R&D inputs at the best prices. Mango was created in 1984 when it opened its first store in Barcelona. A year later it had opened five more stores in this city and started expanding in Spain. In 1992 the company opened two stores in Portugal, signalling the beginning of its international adventure. Mango is now the second Spanish clothing exporter after Inditex.

When analysing the company's history, two distinct periods emerge. The first one from 1984 to 1995, when Mango was progressively obtaining more business knowledge, consolidating the product and point of sale concepts and implementing its just-in-time supply strategy. The second, from 1996 to the present, in which human values have been reinforced, investment in logistics through information and technology has been increased, big retail stores have opened and the organization has become global. The

competitive advantage of the company, which has facilitated its internationalization, derives mainly from the intense use of information and communication technologies in the management and distribution of products. According to one of its managers '...the rapid growth of the company has been possible thanks to the internet and new technologies'.

Mango S.A. currently employs 6500 people and boasts over € 1 billion in yearly revenues, of which 75% are generated abroad. It is present in approximately 90 countries through over a thousand stores, of which 70% are franchises. Franchises are the chosen strategy in countries in which culture and administrative features are very different to those in Spain, which makes it preferable to have retail managed by locals. Design, management and distribution of products are carried out from the head office in Barcelona. However, there are also offices in China and the US, which contributes to the company's learning process.

When considering its expansion strategy Mango decided that owning retail outlets directly could be a limitation, and franchises were considered advantageous in terms of reining in risk while retaining brand and product homogeneity. Mango controls its franchises as if they were its own stores by providing training to the franchisees, allowing them to pay only for sold products, and ensuring that store decoration is the same for all. They have also invested heavily in the brand through advertising and promotions.

According to the interviewees, their main asset is their employees, who are young, motivated, flexible, enthusiastic and creative, and sustain the company's values: humbleness, harmony and affection. In its head office there are people from 36 nationalities. Mango S.A. is a participative company, with creativity and experimentation being fostered throughout the business. 'No one is always right; in a company focused on creativity and high technology, tyranny does not work', says one of the managers.

Mango internationalized gradually by opening stores in neighbouring countries such as Portugal and France. However, Mango was to become a born-again firm (Bell et al. 2003; Svejnova et al. 2007) when in 1996 it expanded internationally reaching the point at which more income was generated abroad than in Spain, also with more stores abroad than in Spain. Thereafter, Mango expanded into 22 countries over a 4-year period.

In order to design and market without manufacturing, Mango developed an innovative organizational model based on a network connecting suppliers, manufacturers, logistic companies and points of sale, allowing any store anywhere in the world receive the products their customers demanded at any time. Building and maintaining this network involves a significant and constant investment in high technology. Consequently, Mango's managers consider knowledge to be a productive and strategic factor that allows them to differentiate themselves and develop a competitive advantage.

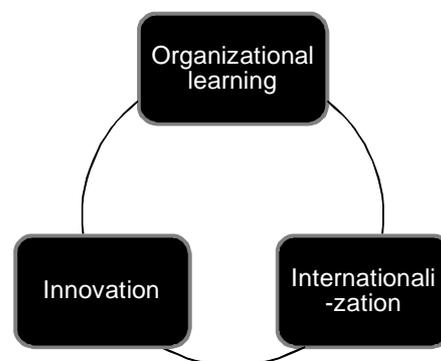
To put it in a nutshell, Mango has been learning continually. They started out as wholesalers, then they moved into retail, and afterwards they decided to franchise and expand through technology and solid products and a strong brand. They feel confident about their products and their potential worldwide. Innovation has been essential all

along, with a strong focus on design and technological innovation. Their products are considered to be exclusive and unique; this is why design has an essential role to play. Up to 80% of their products are universal, with a mere 20% adapted to suit specific country conditions. The design of the collection is carried out in a 10,000 m² building named 'El Hangar', which according to them is the biggest design centre in Europe, with 550 people working annually on 8.000 items. On the other hand the expansion would not have been possible without information and communication technology. It is thus clear that in this case organizational learning, innovation and internationalization go hand in hand. Furthermore, it appears that original innovation, design and TIC, are associated to high degrees of learning and internationalization.

A Mutual Causality Model

Based on the previous sections, and on the interdependencies and interactions suggested by the existing literature and found in the two case studies, we consider that mutual or circular causality might explain the relationship between the three concepts of organizational learning, innovation and internationalization (Figure 1). Accordingly, we might consider that the three concepts or elements we analyse in this paper constitute a complex system. The three elements are partially connected to one another, so the behaviour of any of them is affected by the behaviour of the other two.

Figure 1. The mutual causality and complex model



However, both case studies presented differences concerning the three issues, and it would seem that relationships among the three processes are different in both cases. In order to better understand this complex mutual causality system and theoretically understand and ground the differences between both case studies, we propose a framework based on the tenets of two distinct types of complex systems: complex adaptive systems (Holland 1995; Anderson 1999; Stacey 1996) and complex generative systems (Chiva et al. 2010).

Complex adaptive systems are composed of semi-autonomous agents that seek to maximize fitness by adjusting interpretative and action-oriented schema that determine how they view and interact with other agents and the environment (Dooley et al. 2003). These systems are made up of heterogeneous agents that interrelate with each other and

with their surroundings, and are unlimited in their capacity to adapt their behaviour through experience. Adaptability is a system's capacity to adjust to changes in the environment without endangering its essential organizational features. They adapt to changes through a process known as self-organization, in which the internal organization of a system increases in complexity without being guided or managed by an outside source (Anderson 1999; Axelrod and Cohen 1999). No single programme or element completely determines the system's behaviour, which is rather unpredictable and uncontrollable (Goodwin 1994).

On the other hand, complex generative systems (Chiva et al. 2010) are able to self-transcend (Jantsch 1980). This involves a process that drives agents or elements toward the implicate order (Bohm 1980). Bohm (1980) considers that in the universe there are two orders: an explicate and an implicate order. The explicate order is the way we perceive the world as it unfolds before our senses, a world of separate entities perceived in ordinary personal consciousness (Boucoulalas 1993). Enfolded within the explicate is the implicate order, a more subtle fundamental arrangement of the universe, a world of interconnectedness perceived in transpersonal consciousness, where one's identity transcends the individual self. According to Bohm (1980) and Bohm and Peat (2000), to approach the implicate or generative order requires creative intelligence, which is an unconditioned act of perception that must lie beyond any factors that can be included in any knowable law. Therefore, self-transcendence implies the possibility of transcending the essential organization, mode of thinking or knowledge, which means a more creative and inquisitive approach.

Complex systems, both adaptive and generative, self-organize and self-transcend respectively when they find themselves at the 'edge of chaos' or 'limited instability' (Anderson 1999; Stacey 1996; Kauffman 1993; Gell-Mann 1994), which implies any unstable, different or shocking situation or decision. Complex systems are able to develop three types of behaviour: stable, or controlled by negative feedback; unstable, or controlled by positive feedback; and limited instability or tension between various forces placing it at the edge of chaos. At the edge of chaos, the system is very complex (Gell-Mann 1994), and an equilibrium between stability and chaos is produced, combining both negative and positive feedback (Stacey 1996).

In both case studies, new situations, decisions or failures in some of the elements provoked an edge of chaos situation that unleashed a process of self-organization or self-transcendence. For instance, the failure of Marie Claire's subsidiaries in Poland or Holland might have led to greater emphasis on controlling risks and experimentation, thus reducing learning, and promoting incremental innovations or very 'safe' radical innovations; this may be described as a self-organizing process. Concerning Mango, their investment in IT, design-driven innovation approach and international expansion brought about a self-transcendence process that allowed the company to sustain generative learning, radical innovation and global internationalization strategy, which reinforces self-transcendence. The edge of chaos situation is a form of bounded instability found in the transitional phase between the order and disorder zones of operation for a complex system (Stacey 1996). Consequently, any new product, knowledge or market might provoke certain instability in the system that makes it self-organize or self-transcend. We therefore propose:

Proposition 1: Organizational learning, innovation and internationalization can self-organize or self transcend, as any change can take the system to the edge of chaos.

Although at the edge of chaos either a self-organization or self-transcendence process might happen, both case studies show that the system will evolve in one or another direction depending on the particular features assumed by the processes involved. Considering some of the main typologies within these fields, in this paper we propose two models, the incremental and the global. The incremental model fosters self-organization and is characterized by adaptive learning, incremental innovation and low levels of internationalization. The global model promotes self-transcendence, and is characterized by generative learning, radical innovation and a high degree of internationalization. These models are therefore theoretically grounded in the dichotomy of adaptive and generative learning (see, for example, Fiol and Lyles 1985; Senge 1990), incremental and radical innovation (see, for example, Tushman and Anderson 1986; Henderson and Clark 1990) and the degree of internationalization (Sullivan 1994): low and high degree of internationalization or global firms (see, for example, Bell et al. 2003; Chetty and Campbell-Hunt 2004), regardless of how high internationalization or globalization has been attained, whether gradually or from inception (born-global).

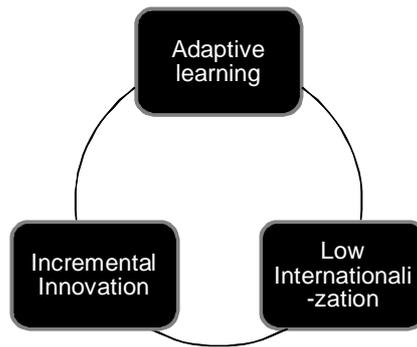
One of the classical typologies in organizational learning literature is the distinction between adaptive and generative learning (Argyris and Schön 1974, 1978; Fiol and Lyles 1985; Senge 1990; Arthur and Aiman-Smith 2001; Chiva et al. 2010). Although nowadays many terms are used to describe these two types of learning, this typology was probably introduced into the organizational learning literature by Argyris and Schön (1974), through their distinction between single-loop and double-loop learning. Single-loop learning permits an organization to maintain its present policies or achieve its present objectives by adjusting or adapting its behaviour. Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off (Smith 2001). It seems to be present when goals, values, frameworks or strategies are taken for granted; it is about efficiency. Double-loop learning occurs when an error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies and objectives (Smith 2001). Senge (1990) states that generative learning, unlike adaptive learning, requires new ways of looking at the world, whether in terms of understanding customers or in terms of understanding how to improve business management. According to Chiva et al. (2010), adaptive learning or single-loop learning is characterized by logical deductive reasoning, concentration, discussion and improvement, and generative learning, or double-loop learning, by intuition, attention, dialogue and inquiry.

It is difficult to be sure who introduced the Incremental-Radical innovation dichotomy, partly because the concept has been used by many authors, often using differing terminologies, but expressing the same meaning. Abernathy (1978) was probably one of the first who differentiated incremental from radical innovation, if we don't take Schumpeter (1934) into consideration. Similarly, Tushman and Anderson (1986) defined

incremental and breakthrough innovations, while Abernathy and Clark (1984) talked about conservative and radical innovations. It is widely acknowledged that, in terms of innovations and their impact at both industry and firm level, important differences exist between radical and incremental innovations (Dosi 1982; Christensen and Rosenbloom 1995; Christensen 2000; Hurmelinna-Laukkanen 2008). An incremental innovation builds upon knowledge and resources already present in the company, which means it is competence-enhancing. A radical innovation, on the other hand, requires completely new knowledge and/or resources, and will therefore be competence-destroying. Most innovations simply build on what is already there, requiring modifications to existing functions and practices, but some innovations change the entire order of things, making the old ways obsolete (Van de Ven et al. 1999: 171). Incremental and radical innovations require different degrees of change that may be explained by a different mix of environmental, organizational, structural, and managerial forces, and therefore may need to be managed differently (Van de Ven et al. 1999).

Concerning internationalization, in terms of timing, there are two main types, broadly speaking. A first type is that of organizations that become international in a slow and incremental manner, due to lack of knowledge about foreign markets, risk aversion and perceived uncertainty (Madsen and Servais 1997). These are generally associated with the Uppsala (Johanson and Vahlne 1977) and innovation-related models (Cavusgil 1980), which involve time-consuming organizational learning processes for the former and an innovative course of action for the latter. Yet another type is that of firms entering international markets soon after their inception (Oviatt and McDougall 1994; Knight and Cavusgil 1996). Unlike firms contemplated by the stages models, these companies internationalize from inception or shortly after, targeting small, highly specialized global niches and implementing a global strategy (McDougall et al. 2003; Oladottir 2009). Born-global firms perceive international markets as providing opportunities rather than obstacles (Madsen and Servais 1997). However, Bell et al. (2001, 2003) found evidence of companies that suddenly internationalize after a long period of focusing on the domestic market. These 'born-again' globals appear to be influenced by critical events that equip them with additional human or financial resources. Furthermore, and according to Chetty and Campbell-Hunt (1994), many attributes of the born-global model also characterize firms that began their internationalization along traditional lines but were radically transformed in the process. Global companies are, therefore, firms that are highly internationalized, regardless of whether they were born-global, born-again global firms or companies that have become global through traditional incremental processes. Chetty and Campbell-Hunt (1994) consider that both born-global and global firms are typically launched into international markets by a world-leading innovation or an innovation based advantage. Global firms follow a more aggressive learning strategy and adapt and innovate more than other firms that have lower degrees of internationalization. A global company has something new to offer to the whole world. Similarly, Balconi et al. (2009) maintain that organizations at the cutting-edge of technology tend to follow a global approach. Consequently, and regardless of process, there are two main levels of internationalization: low (some of which are in the initial stages of greater internationalization) and high (global firms).

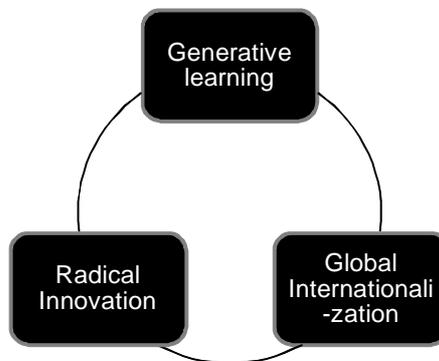
Figure 2. The incremental complex adaptive system model



Based on these descriptions, adaptive learning, incremental innovation and low degree of internationalization are related and involve a similar path (figure 2) characterized by progressive learning and improvement of pre-existing products, concepts and ideas. In the first stages of a gradual process the degree of internationalization is low, with incremental steps, caution, and low risk-taking being dominant. This is the model Marie Claire appears to have followed. We may, therefore, advance the following proposition:

Proposition 2: Adaptive learning, incremental innovation and a low degree of internationalization are related to one another, constituting an Incremental Complex Adaptive System.

Figure 3. The global complex generative system model

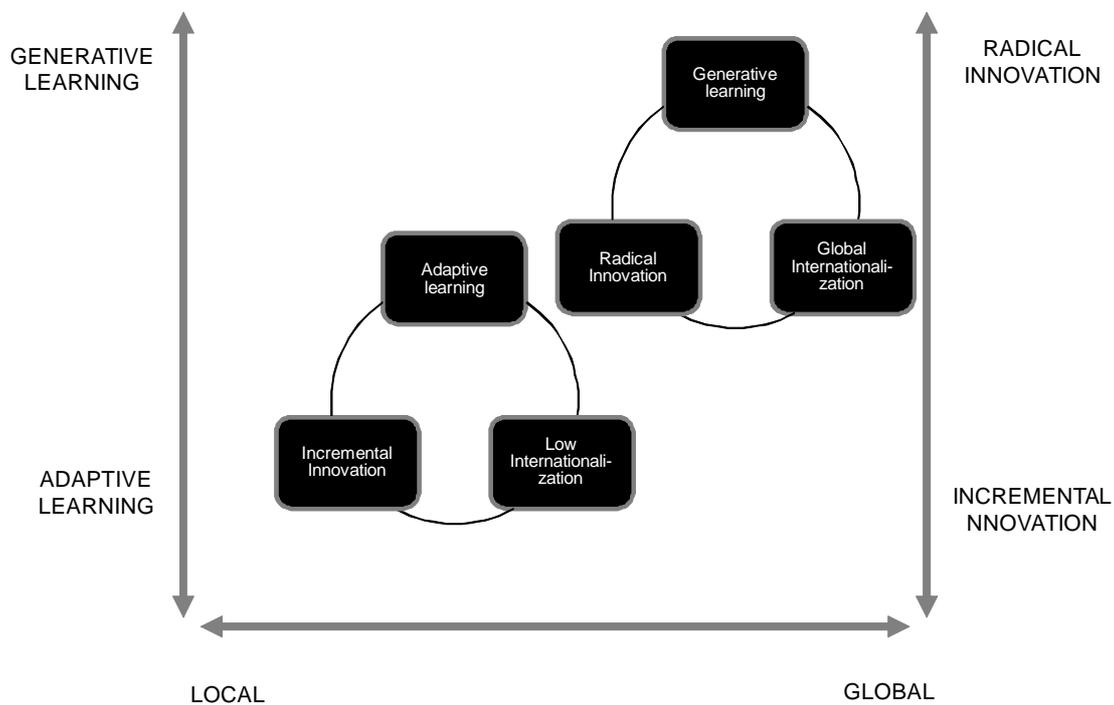


Similarly, generative learning, radical innovation and a global internationalization entail a similar strategy (figure 3) characterized by inquiry, questioning, risk-taking, experimenting and paying attention to the broader picture. Whereas concentration is a process of forcing the mind to focus on a single point, when paying attention the mind is constantly learning without a central focal point around which knowledge gathers as accumulated experience. Such is the case with global firms such as Mango. For these cases we propose the following proposition:

Proposition 3: Generative learning, radical innovation and global internationalization are related to one another, constituting a Global Complex Generative System.

Figure 4 summarizes and incorporates the two models presented in this section. There are three dimensions concerning learning, innovation and internationalization, and two complex system models that represent the incremental and global approaches, fostering self-organization and self-transcendence, respectively. Both models suggest that the three elements reinforce each other. We understand that a natural transition involves passing from the incremental to the global model, which would be sparked by the appearance of one global system's, thus initiating the self transcendence process, as happened with Mango. On the other hand, Marie Claire seems to have avoided or feared such a change, thus remaining an incremental system.

Figure 4. The inclusive model of Organizational learning, Innovation and Internationalization



Conclusion

Literature on organizational learning, innovation and internationalization has traditionally linked these concepts through linear causality, by considering any of them as the cause of another. Linear causality is the relationship between a concept (the cause) and another (the effect), where the latter is a consequence of the former. A therefore causes B, but B has no effect on A. This traditional view, which has its origins in Aristotelian and Newtonian approaches, has traditionally been related to mechanistic and deterministic understandings. Tsoukas (1998: 291) states that the traditional, Newtonian or mechanistic approach is gradually receding in favour of complex, holistic or emergent approaches, characterized by the ability to notice instability, disorder, novelty, emergence, and self-organization, and stressing mutual, reciprocal or circular causality. Tsoukas (1998: 293) justifies in the following manner the appearance of a new scientific approach – complexity theory: ‘If nature turns out to be much less

deterministic than we hitherto thought...then perhaps our hitherto mechanistic approach to understanding the messiness we normally associate with the social world may need revising.' Terms like globalization, innovation, creativity or learning tend to focus on complexity, holism and innovation, which are clearly related to the new complexity theory. In this paper, we have used complexity theory to improve our understanding of the way organizational learning, innovation and internationalization relate to one another.

Although various articles have already explored the reciprocal nature of the relationship between innovation and internationalization (Lachenmaier and Wößmann 2006; Vila and Kuster 2007; Filipescu et al. 2009a,b), the results of qualitative research presented in this paper highlight the importance of circular interconnectivity between organizational learning, innovation and internationalization. We also propose a theoretical model to interpret these linkages – complex systems, which is steeped in the new science of complexity. The theoretical framework in which our model is grounded helps us understand the relationships between the three concepts and propose the existence of two distinct models: an incremental one, based on complex adaptive systems and characterized by adaptive learning, incremental innovation and low internationalization; and a global one, based on complex generative systems, and characterized by generative learning, radical innovation and global internationalization.

The results obtained in both case studies and the tenets of complex systems theory lead us to emphasize mutual causality, edge of chaos, self-organization and self-transcendence in both our models. The system's edge of chaos is attained with the development of new country markets, new products and processes and new knowledge.

We consider this research to have important implications for academic and business worlds. Firstly, the model presented is an example of the application of ideas stemming from complexity theory to the organizational and managerial field. Secondly, the model stresses the importance of circular or reciprocal causality between the three concepts which is, in fact, what the existing literature was already suggesting but in a different way. Thirdly, the circular relationships between the three aspects contribute to the literature on each of them by the way they interact with the others. Fourthly, changes resulting from organizational decisions taken by managers in any one of these areas may have important implications for the others, bringing the system to the edge of chaos and bringing about self-organization or self-transcendence. Fifth, when organizations undergo adaptive learning they tend to adopt incremental innovation and low internationalization strategies. Conversely, when organizations take the generative learning route, they tend to experience radical learning and global internationalization. Managers working in these areas should understand their organizations within this holistic framework, which links the three concepts.

The notion of reciprocal or circular causality, which is central to this paper, is based on existing literature, on our qualitative research and on the tenets of complex systems theory. Future research dealing with these issues should explore the application of these ideas through case studies in other countries and industries and, possibly, include some additional elements in the model, such as organizational structure, human resource management practices and overall business strategies. Further qualitative research might also investigate the extent to which factors such as company size, organizational culture, or industrial characteristics, affect these relationships. In summary, this paper provides a

holistic theoretical framework for understanding the three important organizational concepts of organizational learning, innovation and internationalization, and the relationships between them.

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