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ORCHESTRATING NETWORK BEHAVIOR FOR INNOVATION

(Thesis Dissertation)

Javier Busquets
Director: Mogens Kuehn Pedersen

[1-June-2010]

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Content

Chapter 1: Introduction and Overview

This thesis is about innovation and power. Human nature has always been expressed by our capacity to innovate and adapt to almost any environment (Bowlby, 1962; Giddens, 1991). In the 20th century, the primary function of business organisations was to invent, produce and commercialise their products and services in different markets. As a matter of fact, business organisations in the last century proved to be the best way of disseminating innovation (Schön, 1971). Currently in the 21st century, there is a call to better understand how new ideas, technology and sources of knowledge are managed, based on the premise that novelty can unfold anywhere and that innovation cannot be considered a linear process consisting of a chain of activities.

Innovation is an abstraction embracing many different activities to ensure the long-term survival of firms: from design processes for new products or services to solving problems, increasing efficiency, reducing waste, developing the market and creating new business models (Day & Schoemaker, 2000; Van de Ven et al., 2008; Chesbrough, 2006;2003). On the other hand, innovation is paradoxical in nature in that it can conflict with the existing status quo, that is, incumbent structures which are referred to as the "rules of the game." This term stresses their political nature which, in business, essentially represents the rules and norms of markets and business organizations (or hierarchies) as well as their interaction.

Early innovation studies stressed that novelty (new entrants, new laws, new technologies, and other "invaders") can "annoy" markets by introducing differences that eventually change the "rules of the game" and alter the existing equilibrium. This process can create new conditions which are "destructive" for incumbent firms and existing offerings (Schumpeter, 1942). In contrast, and changing the perspective to the firm level, Alfred D. Chandler's (1962) classic text, *Strategy and Structure*, hones in on innovation to discuss how enterprises develop new strategies to cope with new demands and how, as a consequence, they design appropriate structures to control and communicate activities through the different units that make up the business firm.

Innovation at the firm level, in contrast to the processes of organic life and death, emphasizes managerial action to drive changes to fill the gap between strategies and the needed structures. It can be assumed, then, that innovation is a purposive managerial action requiring choices, investments and the mobilization of resources to avoid inefficiencies along the way. Innovation thus drives a complex organisational metamorphosis to unfold novelty, which, in turn, requires time to provide results and is expressed through a process. As such, innovation can be seen, metaphorically, as a path or a journey (Van de Ven et al., 2008), underscoring the inherent activity of "organising" as the creation of paths towards efficiency which are not pre-defined but dependent on managerial decision-making and action (Van de Ven, 1992).

This path or journey consists of steps into the unknown, managing important risks that may vary along the way. The question is how to set the path. Options include markets and hierarchies, and their interaction. Today's business context reveals increasing discontent with inefficient market fluctuations and cycles and, at the other extreme, mechanistic hierarchies. This researcher stresses here that innovation is dependent on having the appropriate structures, and that these structures, at the same time, can be seen as the result of innovation processes since novelties lead to structural change. Even though there are many *business configurations* (Mintzberg, 2002), organisations have shown a strong tendency to conform to "the machine" paradigm due to their need to develop scale and production efficiency. These kinds of structures show a strong propensity to engage in repetitive behaviour, being prone to highly stable organisational processes which can generate deterministic paths due to their dependency on the inheritance of past efficiencies.

In contrast, Networks lie between markets and hierarchies, and are becoming a preferred context for a strategy based on innovation (Penrose, 2008; Powell et al., 2005). What distinguishes a network from other organisational structures is that it embraces the autonomy to choose to establish relationships driven by creative and differentiated actors. Networks reveal relationships and dependencies among actors (Pfeffer & Nowak, 1976), stressing that innovation

does not unfold in isolation, along with the need for governance and coordination. Here we can use the term 'orchestration' as managerial action to define how a new path for innovation is created and how this path crystallizes into viable economic outcomes. Understanding this process is the main motivation behind this research.

Orchestrating Network Behaviour for Innovation

The main question in this thesis is: "How does orchestration steer network behaviour for innovation?" To respond to this query, this phenomenon is presented as a managerial function to create new structures. Although this discourse is nascent, it has already received some attention in academic literature, combined with the strategic importance of networks, system integration and digital platforms (Chesbrough, 2008; Adner, 2006), the latter emphasising the role of Information and Communication Technologies (ICTs).

Orchestrating can thus be viewed as a managerial function that supersedes how economic factors can be managed to produce efficiently in mass markets. In other words, *Orchestrating Innovation* can be seen as an activity intended to manage investments in order to build paths of efficiency to better compete in existing markets but also as an activity for factor or market creation (Ghemawat, 1997; Miller & Olleros, 2007). Paths are no more than expressions of dynamic and structural change, and networks have been used to examine these phenomena (Powell et al., 2005). These activities also require a better understanding of the duality of dynamic capacities to adapt and transform the environment (Teece, 2009; Augier & Teece, 2008; Pedersen, 1996). This is why I ground this function on a critical review of the existing literature, stressing the longitudinal empirical work carried out from 2004 to 2008 on two different cases of orchestration, spanning a period of approximately 25 years each. The aim of this thesis, then, is to contribute to existing theory and to managerial reflection, as well as to propose ideas for further research.

Innovation, Networks and Power

With this function, the three main subthemes of this work are synthesised as follows: (1) innovation as a source of future value; (2) networks as different from organisations; and (3) power as management's main activity and a means to understanding organisational structures. The intention is to make this research operational by focusing on the dual nature of innovation, that is, to create new factors and markets, and by examining the role of digital technologies in this process. Networks are indeed a good context to examine both the sources of innovation and how users learn to cooperate and use innovations.

We have alluded to innovation as a journey. This notion has an antecedent in the metaphor of Ulysses and his journey from Ithaca to Troy and back. Ithaca here is a metaphor for Ideas, while Troy represents the world (In Latin, *Terra*). One case for the completion of the myth of Ulysses is the invention of the concept of Science: Ulysses returns to Ithaca from the contingent and temporal world to the eternal place where ideas reside. In this metaphor we can see the need for efficiency, on the one hand, because the time for the journey is limited just as human and organisational life is. On the other hand, there is a need to manage innovation, since realistic commitments are required under different conditions and sets of constraints, given that the journey is long and sea and metrological conditions changeable. Perhaps the most celebrated episode of the Odyssey is when Ulysses binds himself to the mast to protect himself from the sirens' songs attempting to lure him off-course (see Elster, 2000). Here, Ulysses reveals his commitment to himself, to his men and the ship. Elster grounds his theory of binding rationality on this episode. By binding, we refer to the definition of an objective and remaining true to this goal throughout the journey, until the end - a fact which gives the trip meaning and represents effective actions, as occurs with a path towards innovation.

The second aspect examined in this thesis is networks. The intellectual appeal of Innovation Networks resides in the variety of issues raised at the organisational level. Furthermore, these networks call upon individual attributes such as

creativity, knowledge and talent which contribute new combinations of existing resources (Pedersen & Larsen, 2006) with an intensive use of information and communication technologies (ICTs). Indeed, innovation is increasingly dependent on digital platforms (Gawer & Cusumano, 2008). Moreover, in the current digital era, it is somewhat difficult to define formal structures or ascertain where boundaries lie. Creativity and talent can be found beyond the walls of incumbent organisations which, in turn, are evolving and becoming more porous. In addition, the establishment of relationships with actors and partners from other organisations leads to the emergence of business networks.

What distinguishes a network from other organisational structures, however, is that the former embraces creative and autonomous workers as part of its very foundation. This is not merely aesthetic intent since it has evident economic benefits: in knowledge-intensive environments, the average EBITDA [1] per employee is 6 times greater than in productive industrial environments (see Beardsley et al., 2006). Indeed, networks are increasingly seen as emergent, alternative ways to organise, based on autonomy and voluntary relationships.

Autonomy deals with empowerment and allows the actors to do more, conceiving networks as relationships among active members in contrast to hierarchical organisations where agents receive orders. Autonomy is about freedom. It highlights that group collaboration does not occur by accident or through coercion but by choice. There may be forces other than autonomy that link people together to co-create and co-produce. In this thesis we shall explore new phenomena that represent emergent organisational patterns which conflict with the traditional idea of hierarchical organisations and "central planners" (Hayek, 1949) as well as with "chaotic markets", which are also subject to non efficient cycles (see Penrose, 2008).

For example, the Linux and Open Source movements encompass more than 200,000 programmers outside formal organisations. If then, we accept that group collaboration is achieved based on human relations outside the "scientific",

[1] Earnings Before Interest, Taxes, Depreciation and Amortization

Taylor-based work plant model, what cohesive force is behind this organisational phenomenon? The concept of knowledge workers emphasises the idea of enhancing effectiveness through talent, interactions, diversity and heterogeneity (Powell et al, 2005). In a network context, creativity and inspiration do matter, but so do perceptiveness, communication and trust. Innovation occurs at the boundaries between mindsets, between subjectivity and objectivity, exploring the provisional territories of the unknown through communication and interactions (see Leonard-Barton, 1995) to create novelty.

Finally, this is why power is the main theme of this thesis. It is worth noting that innovation, as a systematic activity, needs to understand power rules both at the structural level and at the level of managerial action in order to cope with its paradoxical nature, i.e., being critical to ensure long-term survival but, at the same time, serving as a source of conflict and tension in both markets and organisations by challenging the forces of equilibrium (Gersik, 1991). Innovation is not necessarily "good" or beneficial to all. Existing organisations and structures may not accept changes which are dependent on deviations from a previous path. Power is a resource to cope with resistance and with complexity because innovation is not an activity that unfolds in isolation. In a general sense, power is expressed by exerting ones influence to set boundaries or limits of action, reducing uncertainty and holding potential conflict at bay.

Power and innovation, though, have compelling antecedents in both markets and hierarchies. Although hierarchies seemingly have a problem with the markets (and indeed with innovation); due to markets being unpredictable and hierarchies being bent on repetitive behaviour, leading to the production of outdated products and services for non-existing markets, jeopardising the firm's performance and its future existence. On the individual level, there are classic and compelling antecedents which argue that both no control, or too much control may create spaces in which people cannot perform (see Freud, 1921/2001; Morgan, 1997). In addition, there are also "anomic contexts," to use Durkheim's (1937; 1933) and Parson's (1937) terminology, which can repress and eventually destroy the individual's capacity for creativity and learning.

Network Leaders

In this thesis there is an explicit interest in understanding Orchestration as a network capacity, but also the way in which individual leaders are related to this concept in terms of how they exert power and organise for innovation. Thus, this thesis not only examines innovation but also "the innovators" and "the leaders of innovation," since this activity is dependent on strong psychological commitments. Managing innovation is a critical activity (Burns & Stalker, 1961); it is not easy but, rather, decidedly risky and subject to uncertainty. In fact, in contrast with mainstream myths which see the manager of innovation as "the heroic entrepreneur," evidence shows that few managers survive the process of steering tottering organisations down new paths in their quest for structural change (see Kets de Vries, 2009).

As argued, an increasing number of voices are questioning not only existing power structures in organisations and managerial practices (Benkler, 2006) but also the role of management (Hamel, 2007), thus superseding the administrative canon in which human beings are conceived as agents who are passive, reactive, opportunistic and "bound" in terms of rationality. So if group collaboration is achieved based on human relations outside the "work plant" model, what cohesive force is behind this organisational phenomenon? What source of power is behind it? Similarly, power and organisational structures can shape contributions from new voices, along with the contribution of novel ideas and interactions from this new type of worker.

With respect to the question posed at the beginning of this introduction: it is quite obvious that managing innovation is difficult and risky and thus implies facing important challenges. This thesis also examines individual capacities in a more normative way, by considering situations in which the organisations studied face the risk or the reality of discontinuing some business units or production lines. It is precisely in this context that Orchestration has been observed. The question here is, returning to the myth of Ulysses, how managers are able to make realistic commitments under different conditions or sets of constraints, and

how this affects innovation, since the journey is long, and the sea and metrological conditions , may change.

Organisation of this Thesis

This thesis presents Orchestrating Business Networks for Innovation as a managerial function to create and capture the value of innovation. It is only one of many ways to innovate. The core of this function is to intermediate between the past, the present and the future, mobilising relationships and networks to unfold novel results and create a path for efficiency whose objective is to set a path for innovation. This function presupposes that networks are a natural context for creativity and autonomy, opening up new possibilities, because managing network behaviour can change the rules of the game. Managerial capacities focus on how to dynamically manage the equilibrium and boundaries of action. How is the function of Orchestrating Network Behaviour for Innovation better able to adapt as a process-like approach?

This thesis is grounded on the strategic management and dynamic capacities perspective, that is, based on understanding how potentialities unfold towards future capacities (Teece, 2007; Augier & Teece, 2008) and underscoring the notions of co-creation and collaborative organisation (Eisenhardt & Schoonhoven, 1996). Relationships are thus considered to be the principal resource of any network, and, by engaging in relationships, we must understand that they are investments. Since innovation is a journey, the different factors, dependencies and context will change along the way, as will the managerial actions affecting creativity. It also implies openness, new voices, perspectives and the ability to develop learning capacities within the network. By the same token, most products require services from several resources, and firms may need several products and services as well as a combination of knowledge to develop a new resource.

Based on the above arguments, this thesis consists of eight chapters. Following this introduction, Chapter 2 reviews the existing literature on networks of

innovation, providing definitions for the terms *innovation*, *networks* and *power*, and reviewing the literature according to three power dimensions: centrality, control over resources and dynamic capacities. A classification of Networks of Innovation based on these dimensions is also given. Finally, the existing gap that has been pointed out in recent literature between power and orchestration is highlighted.

Chapter 3 presents Orchestrating Network Behaviour for Innovation as a managerial function. This role is presented as a path that starts from the current situation and drives network behaviour to a possible future, seeing innovation as a process or a journey affecting: (1) network dynamics and digital platform management and (2) individual management regarding organisational, economic and conflict management capacities. Networks evolve over time; they are not static structures. A process-level approach and the managerial function in innovation are highlighted. How do processes cope better with the need to innovate in networks? What does network memory mean? How does it affect current and future actions in helping to redefine behaviour and developing guidelines for new actions?

Chapter 4 describes my paradigmatic position and research design, explaining the theoretical foundations for the methodological approach and the exploratory method used. The point of departure for this work in terms of this researcher's scientific position is explained, and the set of analytical techniques and perspectives which serve as the basis to perform the research presented in this thesis are elaborated upon.

Both Chapters 5 and 6 contain an analysis and description of the cases on which the empirical part of Orchestrating Network Behaviour for Innovation is grounded. Chapter 5 presents orchestration's capacity to dynamically manage network boundaries and explores the concepts of roles, relationships, autonomy and robustness; it also proposes a way in which to analyse the cases presented at different stages of network evolution: their formation, growth, change and stabilisation to dynamically co-create digital platforms. Chapter 6 explores the

role of digital platforms in Generative Networks and their relationship with the creation of new markets and dominant designs, co-creative activities and programmed changes based on digital platforms.

Chapter 7 specifically analyses the role of the Network Leader, focusing more on a normative view and exploring subjective perspectives regarding managerial practice according to my observations and reflections in this research. Here, the capacity to manage conflict, organisational capacity and performance is examined. Moreover, the role of leadership and its implications for Orchestrating Networks are analysed.

Chapter 8 concludes with the theoretical contributions of the function presented in this thesis and poses questions and challenges for further research.

Chapter 2: Networks of Innovation, a Literature Review

2.1.- Introduction

This chapter presents the literature review of this thesis: Networks of Innovation and defines *Innovation*, *Networks* and *Power,* organised as the three main themes of this thesis. Next, the main themes that relate networks and innovation are given, as well as the concept of Network Structure and Equilibrium that prepares for the next chapter where the main notion of this thesis, Orchestrating Network Behaviour for Innovation, grounded in structural change and dynamics, is presented.

Finally, the literature of Networks of Innovation is reviewed around the notion of focal firms and orchestrators to describe three power dimensions: centrality, control over resources and dynamic capabilities presenting different structures and configurations. This has two intentions: first, a classification of Networks of Innovation is presented with emphasis on these power dimensions, and second, the gaps between Orchestration and Power are presented and explored.

2.2. – Main Definitions

2.2.1. – Innovation

This thesis defines *Innovation* as the relationship between current business affairs and possible future ones. To that end, it is recognised that innovation is a process that can be represented metaphorically as a journey or a path (Van de Ven et al., 2008). As a process, innovation is required to guarantee long-term organisational survival and to overcome sub-optimal regimes (Elster, 2000:1). However, it is also a source of conflict and tension, since any innovation introduces a difference that can upset the forces of equilibrium in organisations, industry structures and markets (Gresov & Drazin, 1997).

Innovation is linked to *revolutionary behaviour*, according to Elster (1989; 2000), and starts by holding some resources for short-term consumption, and investing them to build and co-create *something new*. This recognises that the potential results and benefits of these shared investments require time. As such, a process view is needed to examine and understand the set of activities involved.

Indeed, innovation dynamics may be synthesised into two major processes: (1) product/market competition, and (2) factor/market creation (Miller & Olleros, 2007; Ghemawat, 1997). The first process linking innovation with business activities is to find or create superior *positions* in good industry structures (Porter, 1980; 1996) and/or to identify, select and deploy *resources* to generate superior performance and competitive advantage (Barney, 1994; Wernerfelt, 1984; see Christensen, 1997; Christensen & Overdorf, 2000).

The second major process, factor/market creation strategies, considers innovation related to changes in structures, behaviour and styles, requiring the definition of a path to manage transitions. This approach is normally analyzed from the dynamic capacities school (Teece et al., 1997; Peteraf et al., 2008), which essentially focuses on organizational change by using capacities and the re-combination of existing resources (Augier & Teece, 2008). Processes of change are normally associated with networks, systemic innovations and digital platforms for extending the resource base at the structural level (Miller & Olleros, 2007; Dyer & Kale, 2007). The strategy to engage in network exchanges is coherent with the aim of sharing the costs and risks associated with "leap frogs" or radical innovations (Penrose, 2008).

2.2.2.- Networks

Network is defined as a set of actors who are interconnected by a series of relationships (Emerson, 1962). Among the many types and existing definitions of Networks and Business Networks (see Alstyne, 1997), *Networks of Innovation* highlight the fact that firms cannot innovate alone, requiring searching for and engaging in productive relationships (Penrose, 2008; Gnyawali & Madhavan, 2001; Jarrillo, 1993).

According to the literature reviewed, studies on Networks of Innovation focus on one of several areas: (1) the types of innovation involved, (2) network functions, (3) clusters, and (4) structural attributes such as "innovativeness" and structural change.

First, Networks of Innovation allow scholars to examine the type of innovation that takes place, that is, whether these networks give rise to: (1) radical or continuous innovations (Christiansen, 1997) or (2) unique or systemic changes (Teece, 1987). Here, innovation studies emphasize the level of connectivity between complementary components (Chesbrough, 2008; Teece, 1989). Second, studies on network functions encompass: (1) diffusion (Rogers, 1995) or – in very few analyses - on innovation generation (Van de Ven et al., 2008; Van de Ven & Rogers, 1988), (2) temporary entrepreneurial structures (Elfring & Hulsink, 2007), or (3) even *transitional organisations* placed at the meso-level of analysis, between industry structures, markets and business organisations (Miller & Olleros, 2007). Third, other studies focus on networks as "innovation clusters" or "hot spots", revealing the dependencies of contemporary firmsupon their network relationships. Clusters enable and support business by raising productivity, the speed of innovation, and the faster formation of new companies (Porter, 1998; Cowan, 2007).

Finally, structural studies examine focal firms, relational dynamics, network density, positions and the network capacity of "innovativeness" (Powell et al., 2005; Powell, 1990; Damanpour, 1991). They focus on processes of innovation and dynamics (Murray, 2002; Brown & Eisenhardt, 1996) that are normally expressed as the generation of paths or trajectories (Pavitt & Steinmuller, 2002; Pavitt, 1984).

In all cases, the emphasis of networks is on actors' autonomy, creativity and motives for engaging in exchanges and communication, aspects that are briefly reviewed in the next sections.

2.2.2.1.- Creativity

Innovation, as the propensity for problem solving and invention, is a natural (innate) human capacity (Huizinga, 1927/2002; Winnicott, 1971). Current notions of innovation embrace sophisticated processes and the management of many sources, making it an organizational activity, that although grounded in natural (innate) capacities, requires learning processes as well. One can define creativity as a function, an *autonomous activity* that gives us "the capacity to create the world" as a result of the experience of being alive and connecting what was unconnected (Kets de Vries, 1980; 2009). It is a part of instinctual human capacities and *not necessarily a response* or reaction to any external stimuli (Winnicott, 1971; 1964). Above all, however, it is related to the need to have fun and feel pleasure (Freud, 1966). Creativity is linked to fun, since it mixes reality and imagination, implying "as if" situations for problem-solving, theories, symbols, projects, riddles and playing (Huizinga, 1927/2002; Winnicott, 1988). This natural capacity allows for the exploration of boundaries between subjectivity and objectivity to recreate the world around us, to understand it better and to engage in productive social interactions.

2.2.2.2.- Autonomy

The key notion here is autonomy, the capacity to choose and engage in voluntary associations (Hayek, 1949/2009; Rand, 1967; Child, 1972). The notion of autonomy is a relative concept since it implies degrees. Further, in order to make sense of the concept, it needs to be differentiated within the framework of the different contexts in which we carry out our activities. Autonomy in terms of citizenship implies freedom of choice with a certain set of constraints normally based on constitutions, laws, as well as on social norms. In business activities, the degree of choice may refer to "job description" or "accountability".

Networks of innovation refer to the degree in which one can establish relationships with other firms beyond the existing legal and cultural organizational norms. Indeed, it is supposed that autonomy allows the actors *to do more*, conceiving networks as relationships among active members, with an emphasis on the links that are set beyond formalized relationships, thus emphasizing commitments and trust dynamics (Thorelli, 1986; Ring & Van de

Ven, 1994; Barney, 2007). Yet, the autonomy is not absolute but rather in degrees and is dependent on the autonomy of others, as it takes two to collaborate. Therefore, by stressing autonomy, the need for constraints is emphasized, since it is not the case that any choice goes.

This contrasts with the passive recipients of orders given by agents in bureaucracies, and also highlights the fact that teams or "group collaboration" are dependent on willingness to collaborate, individual capacities (see Bowlby, 1985), which constitute constraints that make this cooperation possible, emphasising that relationships among autonomous actors do not occur by accident or through coercion. There may be some other forces that link people together to co-create and co-produce. Actors that forge a Network for Innovation tend to create enduring social relationships based on rational choice and the calculation of future benefits and costs (Cook & Emerson, 1984; Child, 1972).

2.2.2.3.- Motives

According to the literature reviewed, actors join networks in order to: (1) share the costs and risks of innovation (Penrose, 2008); (2) take advantage of the superiority of networks in terms of transaction costs (Kogut, 1988; Coase, 1988; Williamson, 1991; 1975), thus reducing risks of opportunism and economic friction between partners along with misunderstandings and conflicts that may lead to delays, breakdowns, and other malfunctions (Williamson, 1994; Eisenhardt, 1989:2); (3) take advantage of strategic and resource-based fit (Kogut, 2000); (4) benefit from social and cultural fit among actors (Eisenhardt & Shoonhoven, 1996); and (5) benefit from trust in network dynamics (Ring & Van de Ven, 1994).

On the other hand, Sociology is based on exchange theories (Emerson, 1962; 1987; see also Molm, 2003) in which the main assumptions are that network formation is the result of: (1) an actor's behaviour motivated by the desire to increase gain and avoid loss; (2) exchange relations developing into structures of mutual dependency and power dynamics; (3) actors engaging in recurrent, mutually contingent exchanges with specific resources and partners over time; or

(4) valued outcomes obeying the economic law of diminishing marginal utility (Molm et al., 2000; Molm, 2003) which leads to the principle of equilibrium that is presented later.

On this basis, Exchange theories predict that the behaviour of individual and autonomous actors depends on exchange dynamics and its effects as outcomes in the structure itself (Emerson, 1962; 1987; see also Molm, 2003). This requires a closer look at structural dynamics and the notion of power and governance.

2.2.3.- Power

Power is the capacity to generate dependencies in others in order to steer their behaviour. It is considered to be a *resource* in organisational literature. In a general sense, it is expressed through the causation of the following effects: (1) the influence over others' behaviour (Scott, 2001); (2) the ability to determine boundaries or limits of action (Bettelheim, 1988; Bowlby, 1962; Emerson, 1987; Mintzberg, 1973); (3) reduced uncertainty (Thompson, 1967/2003; Child, 1972) and (4) holding conflict (Pfeffer, 1994; Milgram, 2005).

As such, power can be seen as linked to strategy and the contingent nature of human action (Clegg, 1989), which is subject to constraints (Barnard, 1938/1968), both in economic and social life (Elster, 1989). Thus, power is connected to strategy, since it is about making a choice to set chosen constraints on organisational behaviour, that is, about shaping a style. Second, power relates directly to structures (Giddens, 1987). Structures are defined by their boundaries (limits of behaviour), roles and relationships, variables that, on the one hand, are interrelated, and do not vary independently, and, on the other, which shape and are shaped by behaviour (Schön, 1971; Giddens, 1987).

Power is related to conflict theories (Gersick, 1991; Pfeffer & Salancik, 1978). This is in contrast to "politics" or the resistance to managerial action (Pfeffer, 1994; Pfeffer & Salancik, 1978). Indeed, networks are political organizations, the arena of tensions and conflict, that Thorelli (1986) metaphorically calls "network entropy." This consists of: (1) conflicting relationships in order to control resources (Gresov & Drazin, 1997); (2) relational tensions between autonomy

and cohesion (Nhoria & Ghoshal, 1997); (3) loose goal-setting and direction; and/or (4) other variables that may conflict with managerial purposive action (Pfeffer & Salancik, 1978; Benkler, 2006). The control of entropy is thus, in a continuous flux of balance with mutual adaptation between actors and the governance and coordination mechanisms (Thorelli, 1986).

Power studies generally start at the relational level (Clegg, 1989; Emerson, 1962) and expand into the aggregated level, addressing the critical notion of "co-ordination" (Galbraith, 1977; 1973) and its influence on relational dynamics, roles and network boundaries, variables that are interrelated with the notion of structure (Schön, 1971; Abbott, 1995). Power in management studies is normally associated with strategy, choices and action towards *equilibrium* and cohesion, that is, how to set and transform structures, the key notions that are explored in the next sections.

2.3.- Network Structures

A network structure is the combination of roles, relationships and boundaries (Abbott, 1995; Schön, 1971). Obviously, structures also embrace network resources such as technology, trust and core competences (Kash & Rycoft, 2000). Boundaries can be defined as limits of behaviour (which has resource-based, strategy, technological and social dimensions), being the result of cooperative decision making as well as investment, which clearly limits and shapes the roles and relationship dynamics, and therefore the structures.

Since networks emphasize autonomy, there may be a variety of actors and roles. In this regard, networks cannot be considered "unitary" or "monolithic" organisations, what should be emphasized is the role of their actors, the reciprocal interactions linked with this, the fit between the actors (at strategic, resource and social levels) and how decisions are made in order to build the structure (Einsenhardt & Schoonhoven, 1996). As such, networks have to be seen as complex systems (Garnsey & McGlade, 2006) which, by definition, *need boundaries to survive and set equilibrium*.

2.3.1.- Equilibrium

Power therefore, has the function to shape Network structures and influence the effectiveness of innovation by maintaining equilibrium within the creative tensions between actors and their conflicting interests, objectives and demands in the network (Quinn, 1988; Shenkar & Zeira, 1992).

Equilibrium is defined as the situation in which the network actors expect to receive more value back, than the risks and costs they incur by being a part of the network (Barnard 1938/1968). In fact, studies on innovation related to equilibrium and change have commanded the attention of theorists for a long time (Gersick, 1991; Weik & Quinn, 1999; Demers, 2007; Lam, 2007).

As such, networks have to be seen as complex systems (Garnsey & McGlade, 2006) where power has the function to shape network structures and explain and locate the limits. Complex structures, by definition, need "rules of the game" to set an equilibrium that leads to a pattern of behaviour which is conducive to survival (Stacey, 2003).

Sociology focuses on how these limits are set: they can be the result of coercion, force and manipulation or of legitimacy, influence, wisdom and signification (Clegg, 1989) which may lead to social consensus to build structures (Parsons, 1937). Consensus is a more democratic (bottom-up) approach which can be understood as the set of constraints or "binding obligation" a society chooses as the rules of the game; this includes sanctions which serve solely as a deterrent (Parsons, 1937).

2.4.- A Classification of Networks of Innovation

After these main definitions, we present a classification of different "Networks of Innovators" based on power This is essentially focused on purposive action and the presence of a focal firm. This classification is based on reviewed literature (Powell & Grodal, 2007; Conway & Steward, 1998) where the criteria is focused on two variables: (1) the existence of a focal firm in their configurations vs. socially emergent relations of all kinds (Scott, 1991; Tuomi, 2002; Bijker & Law,

1992), with little or no managerial action or design, emphasising "political" ties, friendship or work relations (see also White, 2008; Krackhardt, 1992); and (2) the general capacity to innovate (or innovativeness) vs. the purposive capacity to generate one specific innovation, stressing that the locus of innovation, which can be defined as the spot where innovation is "concentrated," can vary from the focal firm to the network (Powell et al., 1996).

The network map presented in Figure 2.2 is derived from traditional static sociogram analysis (or visual structural analysis). It has a quantitative dimension (inclusion, number of ties and density) and a qualitative dimension regarding network components (diversity, sources of innovation, and formal and informal structures). In the figure, and according to literature, the following structural aspects are emphasized: (1) the tendency towards actor isomorphism or differentiation; (2) formal or informal relationships; (3) the type of innovation: continuous, radical, and unique vs. systemic; (4) the variation from top-down managerial processes, associated with task definition, which leads to the creation of relationships and networks.

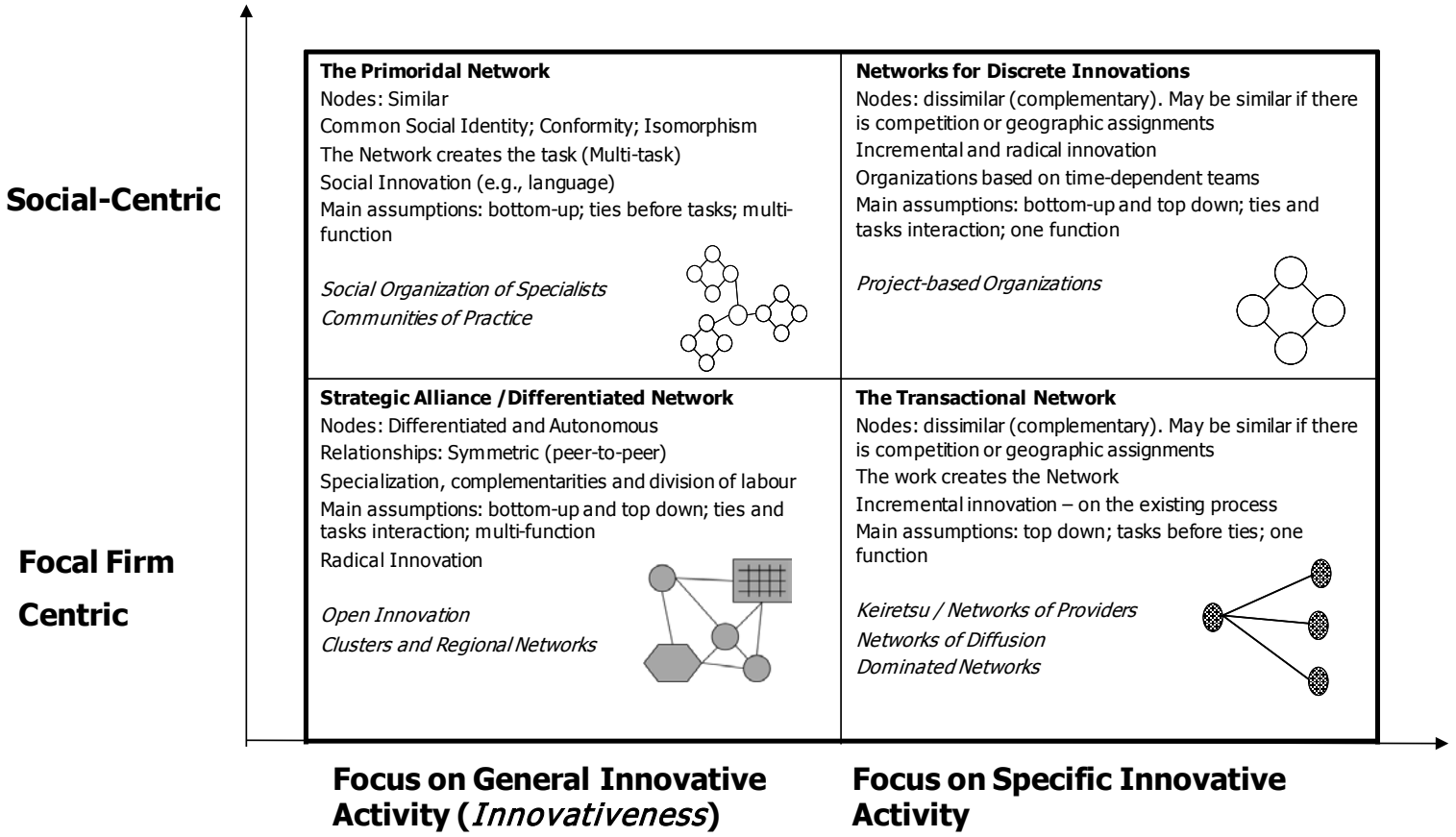
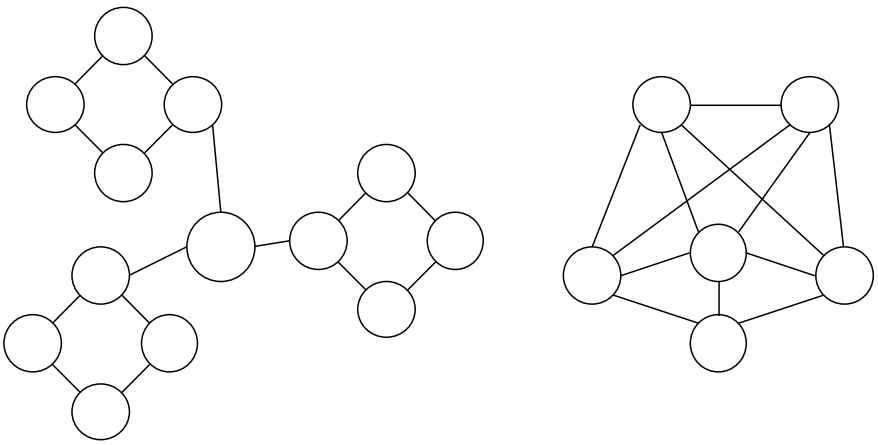


Figure 2.2: Networks of Innovation
Source: adapted from (1) Conway & Steward (1998) and (2) Powell & Grodal (2007)

2.4.1.- The Primordial Network

The *Primordial Network* is the expression of the emergent and natural social order (White, 2008; Giddens, 1987; Emerson, 1962; Merton, 1959; Freud, 1966). The literature normally assumes bottom-up or *emergent* processes of social formation, with the term "social," referring to little or no managerial action (see also White, 2008; Krackhardt, 1992). These include the structure itself as a result, normally through an unconscious processes of identification.

Identification does not necessarily presuppose common identity or trust among members, since this social process is a primordial enactment that "fills the gaps" with one's internal assumptions projected onto others (Wilson et al., 2008). Primordial Networks can evolve into shared identities, trust and learning (Lave, 1988; Lave & March, 1975) that can be found in *communities of practice*, although they may be based on tacit knowledge and experience when producing innovations (Wenger et al., 200; Wenger, 1998).



Structural Hole Theory Social Capital Theory

Figure 2.3: Structural Hole and Social Capital Theories

Focal firms, as depicted in figure 2.3, are created by a collective, but they can also find good opportunities for innovation by linking to distant groups, the focal firms serving as bridges (Burt, 1992). Moreover, focal firms can create a context

in which actors exchange more contacts and social capital in order to enhance the appearance of novelty (Coleman, 1990). In these networks, social structures can last for generations, presenting what is called familiarity or embeddedness (Granovetter, 1985) as a process in which identification can be grounded on familiar roles and structures (White, 2008). High levels of embeddedness may lead to resistance to innovation (Sambamurthy, 2000).

2.4.2.- The Networks of Discrete Innovations

The Networks for discrete innovation are formed or designed to develop a specific innovation and can vary from project-based organisations (Söderlung & Bredin, 2006; Schön, 1971) to long-term relationships with strategic purposes (Gulati et al., 2000), depending on the nature of the innovation.

Network duration and dynamics can be the result of purposive action and/or socially emergent processes, combining design and purpose (Doz, 1996). Their classification can range from informal to contractual, representing the degree of purposiveness or calculation and relating decision-making processes to network formation and evolution (Child & Rodrigues, 2003; Kogut, 2000; Merton, 1959). The social centric approach recognizes that these networks are characterised by initial "informality" (Gummesson, 1999; Mintzberg & Van der Heyden, 1999). In this kind of network there is no clear role for the focal firm. At times, strong leadership may emerge, while on other occasions, leadership is a role that can "rotate" throughout the project. In the literature, references to business networks date back to the late 19th century in the form of "industrial districts" or "clusters" consisting of geographically concentrated groups of small or medium-sized organisations (Breschi & Malerba, 2007) which depended on one another for a variety of services, sometimes related to technology (Porter, 1998; Cowan, 2007).

The main risk, however, is precisely the presence of different leaders with *different* perspectives and interests who may wish to establish different rules of the game at the structural level, in terms of roles, relationships and functions. In this case, political mastery is an essential skill, as is the capacity to generate trust

in order to exchange knowledge and resources for a given project or a task (Thorelli, 1986).

2.4.3.- The Transactional Network

Focal firms steer *Transactional Networks* that have a clear and conscious principle of operation that is driven by the task design, the project and a strong focus on efficiency and operational robustness (Vervest et al., 2005). These relationships are normally considered "formal" and "purposive" in most of the reviewed literature, recognising the power relations between the focal firm and the network (Wasserman & Galaskiewicz, 1994; Powell & Grodal, 2007).

Some examples are *Keiretsus* or *Networks of Suppliers*. Normally in these networks, deep structures remain, and focal firms co-ordinate activities to create sustainable incremental innovations to resolve problems (Lasserre, 1992), as well as to create mechanisms to spread innovation (Rogers, 1995). They do this by downsizing-driven activities that are de-layered, core-competence-based and "lean and mean" (Lasserre, 1992). The reasons for their formation include: (1) a firm's focus on its core competencies (Cohen & Levinthal, 1990); (2) the reduction of internal control in favour of externalising certain activities due to their specialisation; and (3) the reduction of the transaction costs associated with dealing with network partners (Hagel III & Singer, 1999; Gurbaxari & Whang, 1991; Williamson, 1994; 1991). Specialisation and differentiation are brought about by the selection of the firm that controls the network and the various components it comprises.

2.4.4.- The Strategic Alliance

Focal Firms steer *Strategic Alliances* when the actors' roles and governance are clearly set out and when relationships tend to be *long-term* (Gulati et al., 2000). Relationships are normally considered "formal" and "purposive," recognising the power relations between the focal firm and the network (Wasserman & Galaskiewicz, 1994; Powell & Grodal, 2007). Strategic alliances for innovation

emphasise one focal firm that exhibits clear managerial intentions and rules of the game to drive core capabilities, while recognizing emergent processes. These can include system integration and open innovation (Chesbrough, 2008) or R&D activities in a particular field (Powell et al., 2005). For this, managerial action focuses on partner selection and *fit,* affecting the alignment of objectives (Jarrillo, 1993), performance levels, cycles of slack (free resources) and investments (Nhoria & Ghoshal, 1997; Huber, 1991; 2006).

It can be argued that differentiated networks can be a natural extension of Strategic Alliances, since they emphasise the resource view on competitiveness. However, in this case, the focal firm can be associated with the role of *Headquarters*, and putting an emphasis on autonomy may lead to more than one differentiated focal firm (one for each node in the network), thus emphasising power dynamics as a key variable to understanding network evolution.

These Networks of Innovation emphasize resource-based views that argue that each actor may succeed by owning specific, rare, inimitable and unique resources, including tangible and intangible ones (Wernerfelt, 1984; Barney, 1994; 2007). The resource view in networks emphasizes "resource bases" such as relationships, governance and trust (Barney, 2007); product and service specificity (Powell, 1990); knowledge exchange (Tsoukas, 1996; Kogut, 2000); network core capacities (such as software production) and complementarities on their resource base (Teece, 1987; Kash & Rycoft, 2000); and social values and culture (Salk & Simonin, 2003; Eisenhardt & Schoonhoven, 1996).

2.4.5.- The Differentiated Network

The Differentiated Network can be seen as an evolution of strategic alliances adding legal boundaries or as an epistemic project to better understand the innovation dynamics of global firms. This approach emphasises a critical dimension for managing innovation: slack, introduced by Cyert and March (1963) in the *Behavioural Theory of the Firm*.

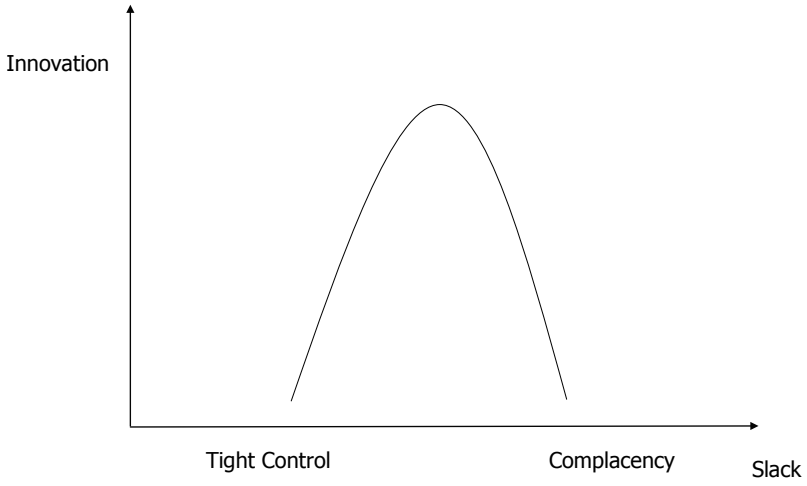


Figure 2.4: Slack and Optimum

Slack is essentially a notion used to define "free resources" such as innovation funds or discretionary payments (see Van de Ven & Hargrave, 2004; Nhoria & Ghoshal, 1997). Slack management is about balance and equilibrium, since, according to Nohria and Ghoshal (1997), innovation and slack have both positive and negative effects: positive, since slack encourages exploration and experimentation (March, 1991) and negative, because (too much) slack may encourage complacency and discourage discipline (see figure 2.4). A connection can be seen between slack and "loosely-coupled" structures. In both cases, their dependence with innovation is an inverse U-Shaped curve, therefore suggesting the idea of optimality. Here, an optimal amount of slack fosters innovation and serves as a point of equilibrium between experimentation and discipline. This optimal amount of slack is a question that every organisation needs to solve - case by case (Nohria & Ghoshal, 1997, pp. 64). Structural dynamics is governed by boundaries and deep structures, and slack is normally associated with discretionary managerial decisions (Cyert & March, 1963). However, they both share the idea of optimality and innovation, understood as a response to cope with the administrative paradox formulated by Thompson (1967) in which organizations need to be efficient at exploiting their resources and flexible enough to dedicate free resources, investing them and build something new.

Networks emphasize a dialectical approach, recognising that they are complex structures of command, expertise, commitments and influence where orchestrators exert power to ensure innovation effectiveness, by maintaining the creative tension between the conflicting demands (Quinn, 1988), and ensuring purposive action that combines design and socially emergent processes (Doz, 1996).

The focal firm can be associated with the *Headquarters* (HQ), as mentioned, serving as the guardian of the doctrine, selecting territories for expansion, choosing the methods of diffusion, training people, socialising and incubating new agents, monitoring performance and keeping the network informed (Barltlett & Ghoshal, 2002). However, every node within the network has autonomy, though we can consider that the firm sets the appropriate, nominal boundaries as a focal firm.

Autonomy raises the issue of strategies and structural fit and its linkage to mutual adaptation between actors in the network. Here, two types of adaptations can be distinguished: (1) technical adaptations in product features or the production process and (2) mutual adaptations that bind companies together, often in a direct physical sense, reflecting a mutual commitment which, at the same time, is limited in time and empowers the companies (Hakansson & Snehota, 1989; 1995)

Orchestration here relates to the management of a complex and plural political system. Business units, depending on their autonomy may have the capacity to adapt to every market and social reality, thus leading to differences and local innovations. Indeed, innovation is related to domestic units and their capacity to distribute innovations between actors, as well as how other Headquarter-level innovations can be spread throughout the network, that is, how they engage in an inter-organisational exchange process.

2.5.- Orchestration and Power

We now present the results of the literature review regarding a specific set of Networks of Innovation, that is, those that have a focal firm in their structures.

In the next sections, we review power and orchestrating theories, normally crystallised in the dimensions of (1) Centrality and Roles, (2) the control over resources, and (3) dynamic capacities.

2.5.1.- Focal Firms and Centrality and Roles

A role, in abstract, is defined by a position, a function and the relationships with other members of the structure (Alvarez & Svejenova, 2005). In other words, a role belongs to the structure, not to the individual, since roles are ways of enacting a position in the existing game. This is why roles can include status and symbolic components. Power Theory considers "roles" or functions as sources of power (Mintzberg, 1973).

The literature on Orchestration identifies the classic notion of power as *centrality* with the existence of *focal firms* in networks (Ahuja, 2000; Krackhardt, 1990). The assumption is that the more central the node, the greater the influence that node has on overall network behaviour and the more dependent other actors become on the focal firm's influence (Thorelli, 1986; Ferriani et al., 2009). Centrality is based on position or pre-eminence (Wasserman & Galaskiewicz, 1994), legitimacy and signals of status (Molm, 2003), as well as on access to critical resources or knowledge sources (Kogut, 2000; 1988). Centrality is also explored for how it affects network-based teams and performance (Ferriani et al., 2009) or how it is correlated to absorptive capacity (Tsai, 2001) and knowledge recombination (Pedersen & Larsen, 2006).

For example, the literature recognises a focal firm's influence on creating and managing a network of suppliers (Jarillo, 1992); it is also seen as a strategic apex or co-ordinator of inter-firm exchanges (Lorenzi & Baden-Fuller, 1995) or, more recently, as an Orchestrator for innovation (Dhanaraj & Parkhe, 2006).

Focal firms can shape the possibility of creating alliances with such non-redundant partners (Powell et al., 2005). This is based on the notion of "multi-connectedness," that is, the degree to which actors are aligned with multiple role-relationships (Conway & Steward, 1998), becoming more and better informed, and thus increasing their bargaining power and gaining efficiency

compared to less central firms (Gnyawali & Madhavan, 2001; Burt, 2004). Moreover, centrality is also related to the need to invest resources and costs for intense co-ordination and administrative activities. It therefore requires a balance between centrality, innovation and performance (Tsai, 2001), as well as the capacity to manage free resources for innovation.

2.5.2.- Roles of the Focal Firm

The literature on Orchestration has metaphorically associated focal firms with *managerial roles* such as leaders, architects, builders, and nurturers (Hinterhuber, 2002) in line with Thorelli (1986), who argues that position and roles are intertwined. However, the most effective innovation leaders do not exhibit a single role; rather, they are characterised by demonstrating a variety of styles and playing other roles in the network, such as those proposed by Kelley (2005): anthropologists, experimenters, cross fertilisers, herders, collaborators, architects, set designers, care givers and storytellers.

An interesting gap in the literature exists between Orchestration roles and leading innovation roles. Van de Ven et al. (2008) propose different innovation roles, in general: (1) the sponsor or entrepreneur who breaks the rules of the game and proposes new ones; (2) the critic, in opposition to the first role, tending to assume a conservative position, challenging innovation; (3) the institutional role which settles disputes and structures; (4) the mentor role, supporting the process of innovation; and (5) the sponsor who procures, advocates and champions the initiative (see Figure 2.1).

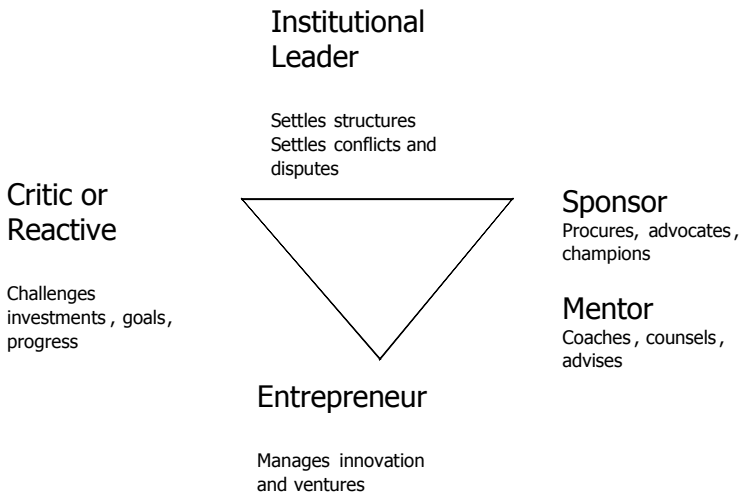


Figure 2.1 Different Innovation Roles

2.5.3.- Control over resources

According to reviewed literature, Orchestrators can exert control over these resources by: (1) *centralising* decision-making and becoming a strategic apex in the network (Lorenzi & Baden-Fuller, 1995); (2) controlling some strategic assets that may provide a competitive advantage (Wernerfelt, 1984); (3) bridging structural holes (Burt, 1992); (4) applying sanctions where needed (Jarillo, 1993; Powell et al., 1995); and (5) managing *network processes* such as resource selection and mobilisation, thereby facilitating co-operative strategies (Häcki & Lighton, 2001; Brown et al., 2002) and managing global operations (Fung et al., 2007).

Orchestrating therefore, can be explored by the effective management of control of network resources such as (1) position, centrality and managerial roles (already described); (2) the relational dynamics between actors in the network structure; (3) trust management and (4) digital platforms, since innovation is (increasingly) dependent on digital assets, communication and interactions (Von Hippel, 2005), aspects that are covered in the next sections.

2.5.3.1.- Relationship dynamics

In Managerial Science, Teece et al. (1997) define relationships as a *dynamic resource* based on interactions, communication and exchanges. Relationships start at the individual level and can be defined by their purpose, that is, they are the result of choices made and the intentions to engage in exchanges, as well as the latter's level of formalisation, intensity and frequency (White, 2008; Granovetter, 1985; Aldrich, 1979). Much of the literature focuses on exploring the relationship between formality and innovation (see Powell & Grodal, 2007; Mintzberg & Van der Heyden, 1999; Gummesson, 1999). While formalization depends on a set of norms and criteria to define what is formal and what is not, the notions of intensity, strength, and frequency can only be explained observing time evolution and dynamics.

Although relationships are normally represented as "lines" due to the profusion of graph theory (see DeBresson & Amesse, 1991; see also, Conway & Steward, 1998), the real meaning of relationships is expressed through their dynamics which shape actors' behaviour and the relationships between them. Here, the preferred unit of analysis is power (Emerson, 1962; 1987; Abbott, 1995), focusing on how actors exchange resources and develop dynamics of dependency, in other words, symmetries and asymmetries. A relationship between actors A and B who exchange the respective resources x and y can be represented by a dyad such as Ax-By. The availability and value of the resources determine the power and dependency between A and B. The more dependent B is on x, the more power A has over B and vice versa (Emerson, 1962). Social exchanges not only include tangible assets, but also capacities such as affection, approval and status (Molm, 2003). Because power is dependent on its value to others, it is an attribute of the relationship, not only a question of the actors or the resources since what is valuable for one actor may not be so for another.

Power and innovation are thus related to: (1) the nature and context of the relationship and its function, taking into account information and exchange of goods; (2) its formalisation, that is, the relationships that are managerially designed or emergent; (3) being competitive or cooperative (Child et al., 2006);

and (4) the intensity, strength and frequency of interactions which are normally shaped by emotional attributes. Emotions are taken into account when scholars differentiate between "strong" and "weak" ties (Granovetter, 1973; 1985) which are the translation of Bowlby's Theory of Relational Dynamics to Sociology.
This is based on: (1) attachment or the need to be close to someone on whose life we are dependent, a need which has developed through nurturing; (2) care-giving, that is, the pleasure of taking care of others; and (3) sex as attraction or desire, which leads to the need for fusion and completion (Bowlby, 1962; 1980; 1985; see Aron & Westbay, 1996).

Theory of Attachment	**Theory of Strong/Weak Ties**
Attachment	Trust
Care-giving	Commitment
Sex	Intimacy

Table 2.1: Comparison between Attachment and Strong/Weak Ties

Moral approaches include "positive" vs. "negative" dynamics normally associated with trust and/or friendship (Krackhardt, 1990). Negative relationships are based on lack of trust, opportunism and visceral human passions such as envy and fear (Elster, 1989). A negative relational dynamic reduces the frequency of interactions, while a positive one increases the exchange frequency (Cook & Emerson, 1984).

Maybe one of the most critical indicators of relational dynamics (and power) is *reciprocity,* focusing on the *underlying structure* of the relationship, which can be termed *asymmetric* or *unilateral* when the flow is one-way, and symmetric or *bilateral* when the flow is two-way. Asymmetric relationships imply inequality in power relationships, and symmetry implies peer to peer relationships (Pedersen & Larsen, 2006; Krackhardt, 1992).

Symmetric and asymmetric dynamics shape knowledge exchanges, routines and relationship-specific assets requiring a dynamic approach to purposefully understand relational dynamics with innovation (Dyer & Kale, 2007). Therefore, dynamic capacities stress how competitive advantages can be obtained when

firms move away from "arms-length relationships" to create "purposeful idiosyncratic relationships" that can facilitate new combinations of resources and capabilities (Teece, 2009; Dyer & Singh, 1998; Almeida & Kogut, 1999).

The above discussion emphasises that a central problem in developing a scientific theory about relationships is the intertwined and underlying economic, social, cognitive and emotional processes involved. Similarly, social dynamics and innovation dynamics differ, and people can use an almost infinite variety of units of analysis, causes and reasons to explain relational behaviour.

2.5.3.2.- Trust

The Neo-Classical perspective does not consider fairness or equity in decision-making processes, therefore omitting the critical role that trust plays in network dynamics (Ring & Van de Ven, 1994; Teece, 2009). This is simply because it considers innovation to be dependent on investments, learning capabilities and knowledge transfers between firms (Gilsing et al., 2008), which require some degree of exposure (Zollo & Winter, 2002; Contu & Willmott, 2003). Resource-based views recognise that trust can be a source of competitive advantage depending on how actors invest in governance schemes and how they set relational dynamics and interactions (Barney, 2007).

Any innovation requires long, strategic relationships in order to create new knowledge. The latter, in turn, requires interactions and exchanges whose nature is essentially tacit (DeBresson & Amesse, 1991). Transaction Cost Economics – although important – fails to grasp the whole phenomenon, as it is biased towards controlling opportunism better. For example, Pedersen and Larsen (2006) suggest that the exchange of "innocuous knowledge" is one process to engender trust, and which allows actors to exchange non-competitive or Intellectual-Property-based knowledge and to later share, combine and co-create new knowledge to change perspectives and innovation structures.

Clemmensen et al. (2008) provide a set of constructs or definitions from different perspectives. These are reproduced in Table 2.2 with some comments (see Clemmensen et al., 2008 for the complete set of references).

Basis of Trust	Construct
Rational Choice	A rational actor only bestows trust if his/her calculations suggest that the benefits of reciprocated trust are higher than the losses implied by a betrayal.
Cognition-based and Diversity	Cognition-based trust is grounded on the factual knowledge that the party doing the trusting has about the trustee. Acceptance of diversity – the good and bad side of any relationship.
Value/Norm-based	Trust cannot exist unless individuals share the same values.
Affect-based trust Expectation-based	Emotional trust consists of the emotional bonds between people such as those provided by the relational dynamics in care, attachment and passion. Identification of the other's expectations.
Impersonal trust	Impersonal or passive trust is given to a social institution.

Table 2.2: Trust Constructs. Source: Clemmensen et al. (2008)

Networks are inter-organisational forms, which, dependent on trust, are superior to exchange transactions and the internalisation policies predicted by classic Transaction Cost Economics. In consequence, networks can serve as a search and evaluation procedure to evaluate the other parties' technologies while ensuring non-cash agreements on technological know-how (DeBresson & Amesse, 1991).

One actor's exposure may entail the risk of exploitation by another actor or the non-alignment between competitive and collaborative behaviour. Child et al. (2006) refer to competitive learning processes as opposed to co-operative ones in which actors can take advantage of other actors' knowledge and not give back anything in return. Elster (1989), by contrast, sees opportunism as a major force for cohesion in social behaviour regarding access to scarce resources. Organisation Theory has devoted a lot of attention to controlling opportunism through *formalised* arrangements or contracts inside and between firms (Eisenhardt & Schoonhoven, 1996). The classical approaches of Agency Theory and Transaction Cost Economics are aimed at formalising methods to control self-serving behaviour or opportunism in more formalised organisations and networks, respectively (Eisenhardt, 1989: 2). In contrast, with the risk of

opportunism found in markets, the actors engaged in a network, in any type of relationship, *expect goodwill* from the others, since relationships require investments whose returns or benefits are postponed in time (Thorelli, 1986).

2.5.3.3.- Digital Platforms

A digital platform is a set of modular components that, on the one hand, offers a standard framework and, on the other, facilitates plug-and-play options (Van Heck & Vervest, 2007). The contribution of any actor to the digital platform makes the network dependent on: (1) the platform functioning; (2) how the network builds and develops it (Von Hippel, 2005; Delporte-Vernieren et al., 2004); and (3) the way inter-organisational processes are digitalised and the correct definition of interfaces among firms (Vervest et al., 2008). In addition, a digital platform offers shared processes, interoperability and compatibility (Alstyne, 1997). The first obvious effect is noise reduction and lower transaction costs among firms (Gubaxari & Whang, 1991).

The author suggests considering digital platforms as a proxy in a Network's *shared investments for innovation.* Indeed, a digital platform may consist of a platform based on digital assets (such as web services) which can be co-created and co-produced, thus underscoring the *role of technology as a space for creativity and co-creation.* This idea highlights the digital platform's role as a resource to contextualize and make sense of the ongoing network activity (Orlikowski, 1996; Orlikowski & Iacono, 2001), but it is also a means to propose new functionalities and compose them with the existing set of digital assets (Gawer & Cusumano, 2008).

Since innovation is a process of stepping into the unknown, dependencies arise in terms of information exchanges and knowledge generation, thus highlighting the importance of digital platforms in network dynamics for innovation. Digital platforms can be seen as infrastructures for innovation (Lyytinen & Newman, 2008; Van de Ven et al., 2008), particularly in networks, since they relate to power, structural resource and working systems (Mason et al., 1997; Day & Shoemaker, 2000). Moreover, digital platforms are the arena in which to carry on

with research on alternative ways for software development. This is evident in Open Source communities (Von Hippel, 2005; Raymond, 2001) or agile developments which can be found between too much and too little structure, focusing on collaboration and quick (or agile) adaptive responses to requirements (Kautz & Zumpe, 2008). Indeed, structures and working systems shape and are shaped by information systems, since communications are based on information-related work (Orlikowski, 1996).

In this context, actors' choices to co-create and deploy digital systems are not the result of agency, teleology or blind adaptation (Lyytinen & Newman, 2008). We thus consider digital platform as a network structural communications system (Orlikowski & Iacono, 2001) that can foster togetherness and trust, allowing information to become knowledge (Kogut, 2000; Kogut et al., 1992) enabling actors to absorb and recombine this knowledge base (Cohen & Levinthal, 1990; Teece, 1987) and, thus, permitting the re-combination of the network's digital resource base, and becoming the means through which the actors' interactions can create new paths.

On the other hand, the social constructivist views stress the capacity to develop innovation throughout social interactions (Elkjaer, 2003; 1999; Tuomi, 2002; Bijker & Law, 1992). In any case, digital platforms in this thesis are considered to be an outcome of the interaction process among actors in a network and a matter of strategic importance, since network and digital platform interactions shape the opportunities to develop options and strategic change and structural design (Easterby-Smith, 1997; Orlikowski, 1991).

In this specific view, strategy links with innovation for: (1) the creation of new platforms and attracting others to develop new add-ons, and (2) expanding markets towards the existing company platform (Gawer & Cusumano, 2008). Creation, co-creation, and the management of add-ons (complementors) are the essence of dynamic capabilities and networks for market / factor creation, where Orchestrating Networks for innovation is an important governance mechanism.

2.5.4.- Orchestration and Dynamic Capacities

Strategic management and dynamic managerial capacities highlight the importance of managerial action and power to purposefully create, extend and modify the firm's resource base as processes of becoming (Teece, 2009; Eisenhardt & Martin, 2000). For that matter, Orchestration is presented in the existing literature as a *network capacity* to dynamically organize innovation (Dhanaraj & Parkhe, 2006). Ritala et al. (2009) propose an *Innovation Orchestration Capability* for "future-oriented value creation" (p. 572) since value creation is dependent on the ability to connect different experts and specialists and enable them to work together (Dyer & Singh, 1998). All these authors analyse Orchestration at the organisational and individual levels, emphasising the fact that individual skills are to individuals what organisational capabilities are to firms.

This means that individuals and organisations can be separated at the analytical level although they are interrelated, since individuals can shape organizational dynamics and relational capabilities which are increasingly important in an inter-connected business world, and are seen as sources of differentiation (Dyer & Kale, 2007).

In particular, the literature of dynamic capabilities emphasizes as network capacities (1) asset orchestration; and (2) value generation and appropriation which are highly interrelated. There are additional related notions according to this view, which are described briefly in the next paragraphs.

2.5.4.1.- "Asset Orchestration"

The concept of "Asset Orchestration" proposed by Teece (2007; 2009) emphasises: (1) the co-ordination of disparate actors without "central planners" (Hayek, 1949); and (2) the combination of emergent collective processes and managerial design (Doz et al., 2000). This notion of governance highlights autonomy (see also Benkler, 2006), and is intended to combine complementary and co-specialised assets among firms (Teece et al., 1997). Pedersen and Larsen (2006) extend this framework to network models of innovation, precisely

underscoring the actors' autonomy and self-control, and the network's capacity to re-combine its resource base, grounded on knowledge dynamics between actors (Cohen & Levinthal, 1990).

2.5.4.2.- Value generation and appropriation

Dhanaraj & Parkhe (2006) hone in on the focal firm and specifically define *Orchestration for Innovation* as the capability to build and purposefully manage inter-firm innovation networks, suggesting a function of value creation and absorption. Orchestration is about generating network externalities and *increasing returns*; this is how network dynamics "expand the pie", by focusing on the orchestrator's capacity to extract *more value* from the network.

Implicitly this approach is related with above discussion on power and the notions of centrality, roles and the capacity to control resources. Dhanaraj and Parkhe discuss how the Orchestrator may have the reputation of attracting members to the network and thus obtain a bigger piece of the pie by managing knowledge mobility, trust, socialisation and shared identity to ensure the stability of network dynamics.

Trust is needed to allow an actor to be exposed to sharing knowledge for a common goal, and to cope with different "enactments," understandings, perceptions and interests in order to be able to propose and combine them with others. The role of the Orchestrator is thus to create an open atmosphere of communication by helping to discuss and establish the basic rules of the game. Trust diminishes the threats of the actors' opportunism, and fosters an equitable distribution of value (Dhanaraj & Parkhe, 2006).

2.5.4.3.- Boundaries and "Complementors"

Chesbrough (2008) argues that the sources of differentiation and even the *firm's boundaries* are dependent on the ownership of knowledge, the management of complementary assets and Intellectual Property (IP). Protection. Value appropriation is dependent on: (1) the nature of knowledge and how replicable it is, with an emphasis on Intellectual Property (IP) protection, and (2) the degree of complementarities needed for a particular innovation, its nature and the

capacity to manage them internally or/and externally through open innovation processes (Chesbrough, 2003; 2006). To this end, complementary assets can be generic - and easy to replicate and specialised and/or co-specialised (see also Williamson, 1995). The economic value of these complementary assets is the sum of their generic use, that is, their specific use plus their residual value in their next best alternative use.

As a consequence, when firms own relevant complementary assets, the outsourcing or licensing of some technologies may be "virtuous" because the firms may exert power over the others and influence how the pie expands, through licensing, the creation of secondary markets and by being able to commercialise an externally accessed innovation (Chesbrough & Teece, 1996).

2.6.- Conclusion: Combining Power and Orchestration

In this chapter, I have reviewed and presented literature about Networks of Innovation and Orchestration as one way to govern networks. Networks are structures grounded on exchanges where power and trust shape the roles, relationship dynamics and boundaries that lead to specific structures. In this chapter, I have also presented existing network structures with focal firms and orchestrators, observing how literature shows that networks with focal firms are associated with *diffusion for specific innovations*, stressing centrality, control over resources and "node-anchoring" dynamics. In contrast, literature that presents the network as the locus of innovation assumes no specific focal firm and an implicit correlation with "innovativeness" as the network capacity to generate innovations. It is also suggested that networks designed for general "innovativeness" assume the capacity to generate core competences as some degree of stability, trust and embeddedness.

The reviewed literature on Networks of Innovation has a bias towards static structural approaches. In contrast, the literature on strategic management and dynamic capabilities emphasises the importance of Orchestration in developing *future paths for profitable innovation* but it is almost silent about (1) how Focal Firms and Orchestrating affect structural changes, that is, boundaries, roles and

relationships and (2) although in innovation studies there is a tradition of setting *trajectories and paths* (Pavitt & Steinmuller, 2002; Pavitt, 1984; Dosi, 1982), this line of thought has a bias towards path dependencies, determinism and teleology where research focuses on how Orchestrating, as a network capacity, can set a *new* path.

In order to fill these gaps, this thesis relies on the proposal of the *managerial function* of Orchestrating that focuses on strategic management to examine network structural dynamics and a process view to better explore how managerial action can change the "rules of the game" governing how actors interact and change their relational dynamics, roles and boundaries. To do so, this thesis is grounded on *managerial power* as the resource to drive change and manoeuvre between flexibility and loose alignment and, at the same time, provide efficiency, certainty and stability (Thompson, 1967/2003; Chandler, 1962). With this approach, Orchestrating focuses on the managerial capacity and power to set strategies and, as a consequence, consider innovation as the capacity to *set paths for efficiency* between the proposed strategies, while stressing decision making for the appropriate actions and resource mobilisation in the design of new structures *for future organisations*. The managerial function of Orchestrating also considers the importance of digital platforms as structural resources that play a strategic role in innovation since they emphasise the importance of having *reliable information and knowledge* with which to make choices when designing organisations (Galbraith, 2005; 1977).

In accordance with previous streams of innovation, structural dynamics and dynamic capabilities, the next chapter of this thesis proposes the function of Orchestrating that is discussed and researched in Chapters 5 and 6 (Chapter 4 contains the research design). It will present empirical work and adopt a propositional style by comparing existing literature with empirical findings to fill the gap presented.

Chapter 3: Orchestrating Network Behaviour for Innovation

3.1.- Introduction

In this chapter the managerial function of Orchestrating Network Behaviour for Innovation is defined as establishing a path towards innovation. The role of the focal firm or Orchestrator and its capacity to manage structural dynamics and digital platforms is specifically proposed. This researcher takes a dynamic capacities perspective to analyze structural change and examine the change to boundaries, relationships and roles, as well the role of information and communication technologies (ICTs) in structural changes (Lyytinen & Newman, 2008; Kautz & Zumpe, 2008).

This chapter is organised as follows. First, the concept of Orchestrating Network behaviour for innovation is defined. Second, we incorporate the concepts introduced in chapter 2 and developing them in a dynamic context to extract the meaning of optimality for "loose coupled structures," defining what a path of innovation is in this context. Thereafter, the main components of the function are described. The themes of structural dynamics and innovation with digital platforms are highlighted and developed in further chapters of this thesis. Finally, Orchestrating, at an individual level of analysis introduces managerial capabilities such as organization, conflict management and economics.

3.2.- Orchestrating Network Behaviour for Innovation

Orchestrating Network Behaviour for Innovation is defined as a function to build a *path* towards innovation (figure 3.1). It is assumed that for innovation it is up to the managerial function to dynamically manage equilibrium, requiring choices and purpose. These paths are considered to be expressions of network dynamics, thus implying that technological and social dimensions evolve by influencing one or the other. The success of changes is dependent on how this path is set and

through which decisions and actions aimed at managing degrees of freedom in the network, that is, which boundaries or constraints.

In this context, strategic management is considered to be a critical network managerial capacity to fix a purposive set of actions to build a path for all the actors in the network. Innovation is enabled by shared investments and shaped by a set of external constraints which need to be managed or orchestrated in order to set a course of action based on choices and activities in a context of radical uncertainty (Cheng & Van de Ven, 1996). It is in this context where orchestrating is placed as a managerial capacity to exert power to deal with structural dialectics. Orchestrating Innovation considers that paths are not pre-defined trajectories that need to be set by fixing and regulating constraints, since continuity may be challenged by tensions among autonomous actors with different interests. More specifically, the role of the focal firm and its capacity to control relational dynamics and other resources such as technology and dynamic capacities at the structural level are explored, suggesting that different conditions can result in different patterns of network evolution.

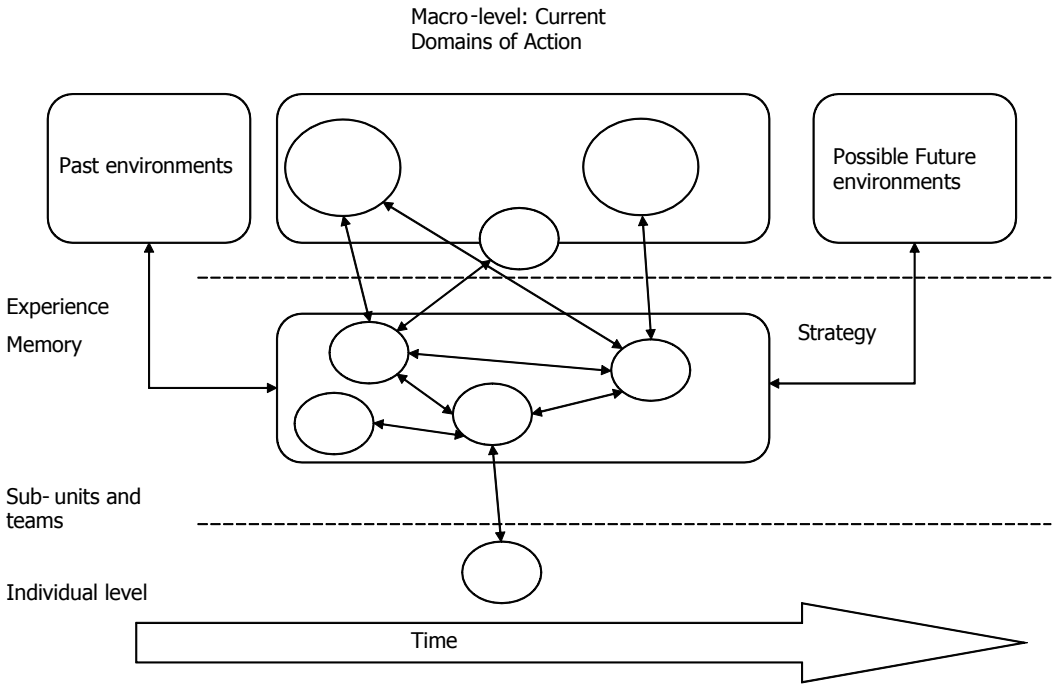


Figure 3.1: Network Behaviour for Innovation

To that end, orchestrating is a function of (1) changing the rules of the game to keep the game alive and (2) avoiding disruptions, thus ensuring continuity through the connection between the old and the new, or between past behaviour patterns and the present and future ones. The hypothesis is that this function has a positive influence on the network's structural innovative capacity or innovativeness, and takes advantage of digitally-enabled processes (see Figure 3.2).

Orchestration shows power through its influence on relational dynamics, roles and network boundaries. With this argument, it is stressed that decision-making and action-setting are always processes of balancing different forces, as all the actors in the network may exert a certain degree of power and influence since innovation does not necessarily end with performance improvements.

Power in this function underscores the role of strategic leadership through "how" things are made through choices and managerial actions of design and adaptation (Augier & Teece, 2008), recognizing the flexibility of setting direction and incorporating other views, other perspectives, and/or other emergent actions. It represents setting a path by managing optimality and equilibrium (Eisenhardt & Schoonhoven, 1996; Eisenhardt & Martin, 2000), thus the governance of different optimal situations can be achieved along the way, followed by sub-optimal ones and the transitions in between (Brown & Eisenhardt, 1997), giving shape to cycles and fluctuations in an ongoing equilibrium.

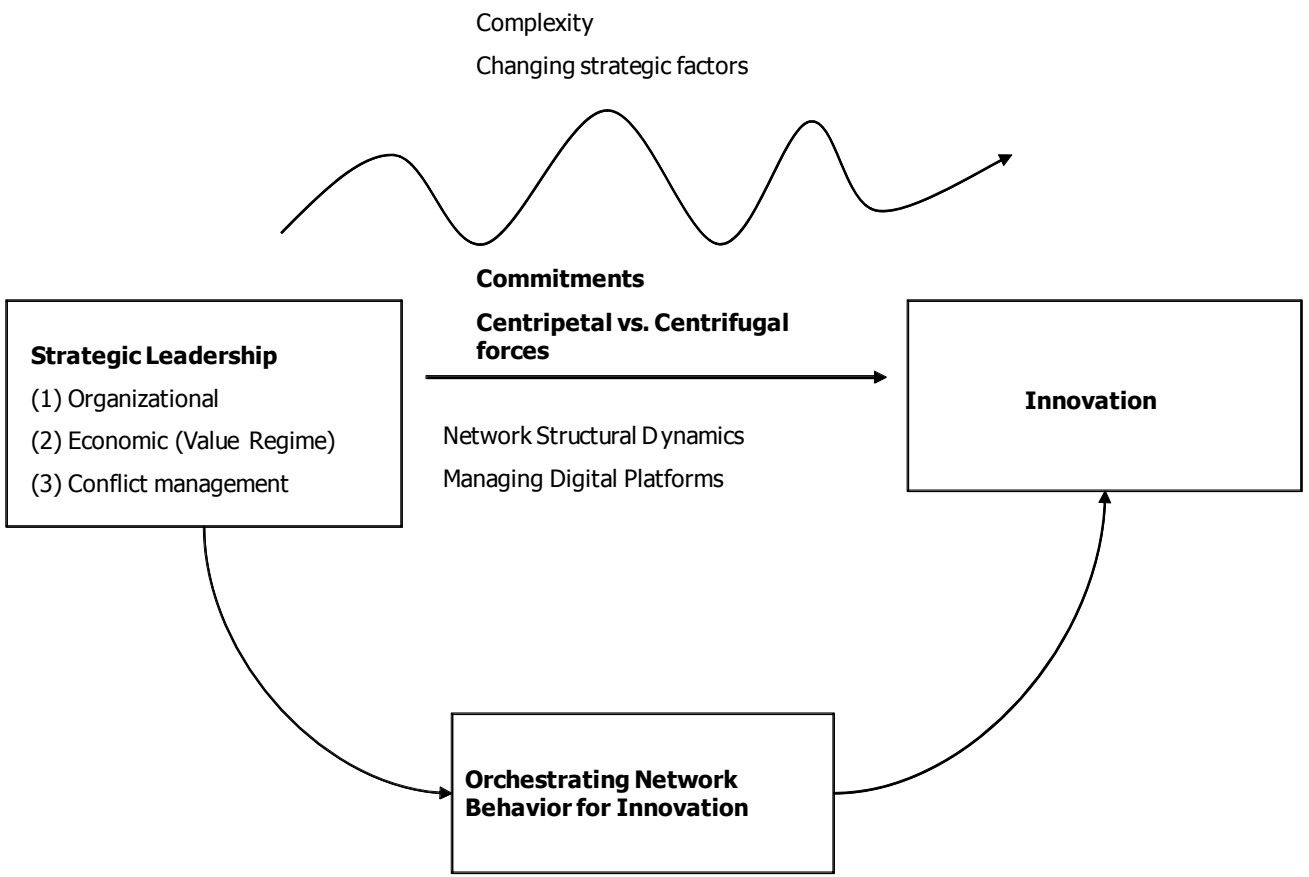


Figure 3.2: Orchestrating Network Behaviour for Innovation as a Managerial Function

3.3.- Networks as Optimum configurations for innovation

To ground the managerial function presented in this thesis, it is assumed that Networks are *optimal configurations or structures for innovation* (Ferriani et al., 2009; DeBresson & Amese, 1991; Conway & Steward, 1998). The notion of optimality comes from the common consideration that too little structure makes it difficult to manage change, while too much makes it hard to move (Burns & Stalker, 1961; Lawrence & Losch, 1967). To explain this, it is necessary to present the concept of loosely-coupled structures (Orton & Weik, 1990; Brown & Eisenhardt, 1996) as lying in between unstructured chaotic markets, and too much power leading to highly controlled bureaucracies (Thorelli, 1986; Powell, 1990).

The author here suggests that too much and too little structure leads to chaos, or negate the capacity to organize. Chaos is normally associated with little or no structure. However, according to mathematics, chaos has another meaning, implying a state of "bounded order." Order and chaos cannot be explained as graphs of dots and lines, but according to structural dynamics, too many or too few constraints reduce the levels of freedom and thus lead to deterministic patterns of behaviour (Van de Ven et al., 2008), which become chaotic.

Brown and Eisenhardt (1997) emphasise the dialectic of power between cohesion and autonomy when they describe networks as "semi-structural, lying midway between highly structured or mechanistic organisations and unstructured organic organisations with few responsibilities and processes" (p. 28). I interpret that the extremes, no structure or tight structures, tend to be chaotic (non-predictable and deterministic respectively), where loose coupled structures incorporate the capacity to change and set paths, thus being the optimal structure to fix order as a continuous process of organising (Bohm & Peat, 2002), as depicted in Figure 3.3

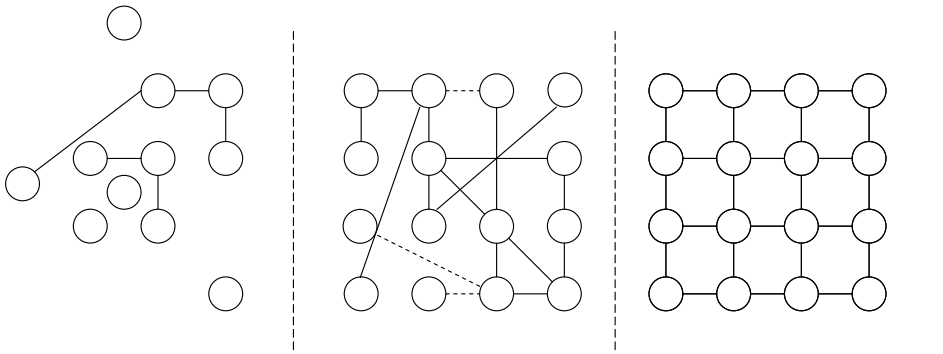


Figure 3.3: Order and Chaos

The latter has an interesting connection to administrative theory and psychology. Although there are many configurations and structures, business organizations reveal an important bias towards mechanistic processes (Hamel, 2007), often associated with greater operational efficiency than is normally evident in large-scale operations. This way of organising human endeavours drew the attention of early sociologists who studied how labour conditions affected employees' emotional moods. Their conclusions – drawn on studies from the 19th century – were that creativity is dependent on power intensity: too much control and too few rules produce "anomic forms of division of labour" (Durkheim, 1937) or, according to psychodynamics, the repression of creativity (Winnicott, 1965; 1971; 1988), and the consequent destruction of innovation. Anomie can be defined as a subjective sense of despair and uselessness due to the interaction with social context, also having clinical implications for mental health (Kets de Vries, 2006; Winnicott, 1988), which are out of the range of this thesis. While early on, Durkheim focused on "too much structure" to explore anomie, Parsons (1957) used this term to study "too little structure" and innovation in society, which, according to him, could be considered as deviant behaviour since it broke the rules of the game, making society unstable (Parsons, 1937).

With the power perspective chosen in this thesis, it is recognized that networks change through a dialectical process, reflecting the natural tensions among actors to control resources and to set direction. These dialectical dynamics also recognise that networks are complex structures of command, expertise, commitments and influence, and this author posits that power studies show their influence on relational dynamics, roles and network boundaries. These aspects are reviewed in the following sections in which the components of the presented function are elaborated upon: (1) strategic management and power through commitments (section 3.3); (2) network structural change and equilibrium (section 3.4); (3) digital platforms as infrastructures for innovation (section 3.5) and the (4) Network Leader describing organizational capabilities, conflict management and economic capabilities (section 3.6).

3.4.- Power and Commitments

This author proposes that the orchestrator specifically exerts power through *commitments*, that is, a combination of power and trust (Elster, 2000; Ghemawat, 1997; Bowlby, 1962), the latter serving as the *raison d'être* to look into the future: to try to project this future before leaping into it. Commitments emphasize their relevance in uncertain environments (Cook & Emerson, 1984) and the need to establish "psychological contracts," stressing mutual understanding among actors in network activity (Child et al., 2006). In turn, network activity requires setting prerogatives and obligations, thus stressing the intense psychological effort and patience needed to achieve the required trust to set commitments. It is also assumed that trust is dynamic or time-dependent, as are the essential relationships. It consists of different phases: (1) deterrent and calculative at first, (2) based on knowledge exchange and representations, and (3) identity-based in more evolved relationships (Shapiro, 1987; Clemmensen et al., 2008). We turn now to explore some pre-conditions to commitment.

3.4.1.- Autonomy and Creativity

The main pre-condition for commitment in this function is autonomy (or *freedom*) and creativity as presented and discussed in chapter 2. It is a classic argument that individuals and even societies have constrained their freedom with explicit rules of the game (Huizinga, 1927/2007) to protect the very freedom and the individuals that constitute the society itself (Popper, 1957; Merton, 1949; Freud, 1966/2007:1; 1966/2007:2). This is particularly to protect humankind from visceral passions through shared consensus and limits on behaviour. On the individual level, we have argued that creativity needs constraints in order to be productive.

3.4.2.- Path Dependencies and Deep Structures

The second pre-condition is memory. As in any other organization, in a company, the past is stored in organisational memory which expresses itself in many ways, but this thesis is interested in the dynamic: in existing behaviours, processes and patterns. Some scholars explain change with the notion of "deep structures" or the set of fundamental choices a structure has made (Gersik, 1991) that provides a certain behaviour. Past choices affect roles, relationships and boundaries, as well as other structural resources. In contrast with popular wisdom, memory not only resides in "images," "myths" or "culture." Memory resides in deep structures, in behaviour, which is highly stable due to: (1) the tenacity of initial choices related to the beginning of the existence of structure and self-survival mechanisms (Eisenhardt & Schoonhoven, 1990); (2) the fact that structural behaviour is reinforced through feedback loops (sometimes called organizational learning) to keep the structure intact or subject to short-term adaptations (March & Simon, 1958; Argyris & Schön, 1978; 1996); and (3) symmetries and asymmetries in relational dynamics affecting deep structures (an aspect I develop in following paragraphs).

We argue that deep structures can be thought of as the design for the rules of the game where equilibrium periods can be compared to a game in play (Gersik, 1991; Huizinga, 1927/2007; Winnicott, 1971) in which actors play some roles and

establish some relationship dynamics within certain boundaries of behaviour, and where the benefits of playing are greater than the costs and risks associated with doing so. As argued, roles are linked with relational dynamics where power is analyzed through *reciprocity,* termed as *asymmetric* or *unilateral* when the flow is one-way and symmetric or *bilateral* when the flow is two-way. As argued, asymmetric relationships imply inequality among actors and, as a consequence, a latent conflict.

Based on this approach, the notion of "organizing at the edge of chaos" obtains full meaning as an optimum proposition. Too many constraints reduce the degree of freedom, and the dependency with the past is so strong that structures can only take pre-determined steps towards teleology. With no constraints, network behavior is unforeseeable. In both cases, deep structures are chaotic, and the required value equality cannot be fulfilled in the long run.

In social systems the issue is "how" power set boundaries, from consensus to repression. The resulting behaviour generates what is called path dependencies, or in other words, the future of a structure is dependent on the existing one (Pavitt, 1984; Pavitt & Steinmuller, 2002).

3.5.- Network Structural Change

Orchestrating through commitments is about: (1) having few choices; (2) maintaining consistency with respect to these choices to direct the course of action; (3) holding conflict inherent to any change; and (4) a dynamic capacity to set constraints to broad patterns of network behaviour (Ghemawat, 1991).

3.5.1.- Dynamic Optimums

The objective is to search for an ongoing equilibrium. Optimums are not a teleological "final objective" as critics of rational choice argue (Elster, 2000; 1994). Rather, orchestrating is a process in order to set the path, along which different optimal situations can be achieved, followed by sub-optimal situations

and the transitions in between (Brown & Eisenhardt, 1997). This process thus shapes the different cycles and fluctuations as depicted in Figure 3.4. Commitments require interacting with others and exploring the unknown to manage investments and create new meanings. This can be achieved by creating experiments and designing new steps to be taken.

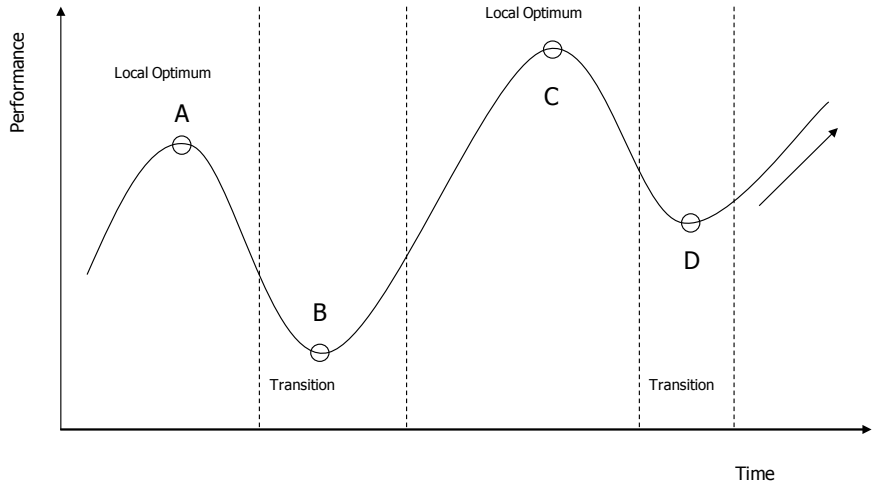


Figure 3.4: Network Dynamics as Local Optimums and Transitions

Innovation is a process of experimentation: outcomes are never the best (of all) options. They are more a modest set of local maximums such as "A" and "C" (in Figure 3.4) along a continuous path of improvement. Innovation may also go through troughs "B" and "D," recognising that change can include a reduction in performance due to these transitions.

In fact, studies on innovation related to equilibrium and change have commanded the attention of theorists for a long time (Gersick, 1991; Weik & Quinn, 1999; Demers, 2007; Lam, 2007). According to these studies, organisational changes can be explained through teleology, life cycles, dialectics (power dynamics) and evolution (Poole & Van de Ven, 2004) and how equilibrium and change occurs: (1) gradual change, where there is a process of on-going adaptation, and (2) punctuated equilibrium where new "species" arise abruptly, through sudden "punctuations" or revolutions (Gersick, 1991; Weik & Quinn, 1999). As Gersik notes, human structures may look turbulent though the

underlying structures are stable, while hypothesising that others may look stable for a period of time, but they can mask deep structural changes that suddenly burst in punctuations. The assertion is that a change from one game to another is through transitions - at times through upheavals - leaving the structure temporarily disorganised and necessitating the making of choices around which a new deep structure forms.

Dooley and Van de Ven (1997) suggest that innovation dynamics can be expressed as a set of combined phases of divergent and convergent behaviour, which explains the dynamics described above, of the peaks and troughs, respectively. Convergence means a synthesis towards equilibrium, narrowing the possibilities or constraints for purposive action. In contrast, divergence is about searching, "branching behaviour," experimentation and the exploration of new possibilities (Dooley & Van de Ven, 1997; see also March, 1991).

3.5.2.-Centripetal and Centrifugal forces

In this thesis network boundaries is defined as a *set of fundamental commitments* between network actors, commitments which shape the network's structural traits: roles, relationship dynamics, complementarities, the technology deployed (e.g., a BNOS), and co-ordination mechanisms (Thompson, 1967/2003; Malone et al., 1987; Montgomery & Oliver, 2007). This research takes into account the fact that boundaries, relationship dynamics and roles are interrelated variables, not independent ones (Abbot, 1995).

We argue that orchestrating is intended to create competitive advantage through the careful selection of commitments with specific partners, choosing the type of relationship and the deliberate investment in these features. Indeed, the notion of relation-specific assets in networks refers to the assets of a partner who customises them in order to adapt to another partner and facilitate a systematic frame of innovation (Dyer & Kale, 2007). In order to study this phenomenon, we use the tensions between centrifugal and centripetal forces as the units of analysis since they shape the network structure (Montgomery & Oliver, 2007).

Centripetal forces dominate the network when actors feel motivated to be a part of it. Relationship dynamics will tend to be cohesive, but they are the result of a combination of factors, including economic aspects and social opportunities (Eisenhardt & Schoonhoven, 1996).

Relationships are not necessarily intended for investment, as argued in this thesis. Thus, we take into account the fact that cohesive forces in social action may hide a conflictive nature, such as many forms of opportunism, which can be defined as the asymmetry between intentions, and what is given and what is received (see Elster, 1994; Child et al., 2006). As argued, innovation is a different game, one where relationships require commitments in order to invest and engage in co-creative activities. Powell et al. (2005) focus on power to explore network creation processes in innovative ventures. They propose several attachment dynamics: (1) accumulative advantage; (2) homophily or isomorphism; and (3) "follow the trend." First, accumulative advantage occurs when a node receives a disproportionate number of new connections. Second, with isomorphism, new partners are chosen on the basis of their similarity. Third, network expansion follows a herd-like process in which choices are made, depending on others' choices, either as a response to external pressures or as an imitative behaviour.

Centrifugal forces, by contrast, can encourage actors to weaken the relationship and their commitments, or leave the network altogether if any of the strategic or resource complementarities offer a poor fit and lead to competitive relations more than do co-operative ones.

Centripetal and centrifugal forces may vary along the way, depending on the capacity to reach commitments. This can affect: (1) the actors' strategic position; (2) their access to new or complementary resources or new markets; (3) new sources of knowledge (Kogut, 2000; Jarrillo, 1993); (4) co-ordination costs and risks (Williamson, 1991; (5) their capacity to search for complementarities (Teece, 2009); and (6) their social values and trust. From a dynamic view, we can also see that centripetal forces lead to cohesion when there are positive economic returns (Teece et al., 1997), stability, network externalities and lock-in (Shapiro & Varian, 1999), while sources of change can unbalance the equilibrium

as a centripetal force. Moreover, where a network can go (its future structure) is a function of its current structure (Teece et al., 1997). This, in turn, is a function of its capacity to change or establish new paths, and overcome the forces of resistance to change due to structural rigidity or over-embeddedness (Sambamurthy, 2000; Granovetter, 1985).

3.6.- Digital Platforms as Innovation Infrastructures

The cases analysed as part of this thesis are based on information-related work, stressing that actors' choices are not the result of agency, teleology or blind adaptation. We refer here to the fact that digital platforms are a means through which the actors' interactions can create new paths. It is understood that digital platforms are the result of many accretions which influence each other over extended periods, thus permitting the re-combination of the network's digital resource base with a focus on agile developments (Kautz & Zumpe, 2008) and becoming the means through which the actors' interactions can create new paths.

It is important to note that we have been differentiating between "systems" and "structures". Up to now, information systems have emphasized clearly set interfaces to establish limit and integrability mechanisms and tools between the network system and the different actors (Delporte-Vernieren, 2004); and providing information transparency and tangibility for network automated operations, as well for generating more information to innovate (Zuboff, 1985).

Very recently, Miller and Olleros (2009) have proposed that the *degree of tightness* among software components may lead to different strategies around digital platforms from (1) high system integration (e.g., software commercial platforms) to (2) modular system design. The second emphasises the co-creation of digital platforms that should: (1) solve a critical business problem, developing a function or a set of functions that can be described as the "system of use"; (2) be easy to connect and disconnect or easily present plug-and-play options (Van Heck & Vervest, 2007); (3) include an embedded network logic supporting inter- and intra-organisational processes and control variables; (4) come with a

standard and modular architecture, a "Lego-like" structure such as web services that can be combined in specific ways.

3.7.- The Network Leader

Leadership is a critical activity in innovation (Mintzberg, 1973; Kets de Vries, 1980; Van de Ven et al., 2008; Álvarez & Svejenova, 2005). The (few) choices available to develop a consistent continuity in terms of strategy (or pattern of behaviour) lead to steps or experiments that can be consistently small or punctuated by a few large ones (Ghemawat, 1991). Triggers may come from exogenous forces, such as changes in technology, regulations, institutions or endogenous forces, such as a customer demanding better performance or new solutions (Miller & Olleros, 2007; Doe & Schoemaker, 2000).

Commitments stemming from choices are the basic argument of *binding rationality*, that is, the freely chosen decision to bind oneself to proceed. This idea is proposed by Elster (2000:1; 2000:2). The latter uses the metaphor of Ulysses "binding himself to the ship's mast" in the famous episode with the Sirens, recognising his own weakness upon hearing the sound of the sirens' songs but also showing his courage by carrying on with his journey to Ithaca.

Taking this perspective, we consider strategic leadership from an individual level of analysis (Ritala et al., 2009) and define three dimensions of Orchestration grounded on the managerial functions proposed by Pedersen (1996):

(1) Organisational Capacity: managing choices and actions regarding how to select partners; how to manage relationships; how to achieve structural and strategic fit, and managing co-operation for co-creation while keeping the network united;
(2) Economic Capacity: how to make investments together (Gilsing et al., 2008; Murray, 2002) and generate a value regime for value creation and absorption; and
(3) Conflict management.

3.7.1.- Organisational Capacity

Orchestrating is a function that builds a *path of efficiency* since it provides value by not representing a traumatic break with past activities, something which always implies a waste of resources. It is a way of re-combining them in different ways and adding new components to existing ones. It is assumed that orchestrating smoothly paves the way. We consider that successful innovations depend on how Orchestrators manage teams and relationships, thus inviting individuals to consider divergent behaviour, along with a wider range of alternatives in diverse and multi-connected networks (Powell et al., 2005) that drive convergent behaviour, focusing on specific innovations. Leaders listen, scan and monitor the network, and use their status to obtain relevant information, as well as organize people to achieve goals. But they also decide to establish relationships with talented individuals and specialists who may be connected (Dyer & Kale, 2007). We therefore focus on the capacity to manage boundaries: how to select partners, how to achieve structural and strategic fit, how to manage relational dynamics and manage co-operation for co-creation activities while keeping the network united.

This capacity is directly related to commitment by regulating network boundaries through centripetal and centrifugal forces that may lead to lock-ins and lock-outs, respectively (Ghemawat, 1991). Lock-in refers to organisational persistence and core-capabilities. Commitment is not over-embeddedness, resistance to change, and other rigidities (Leonard-Barton, 1995) since commitment always presupposes autonomy. By contrast, lock-out, is the motive behind commitment, when firms decide to disinvest - since, once this decision is made, it may be uneconomical to restart without jeopardising the levels of efficiency (Ghemawat, 1991). This discussion is synthesized in Figure 3.5.

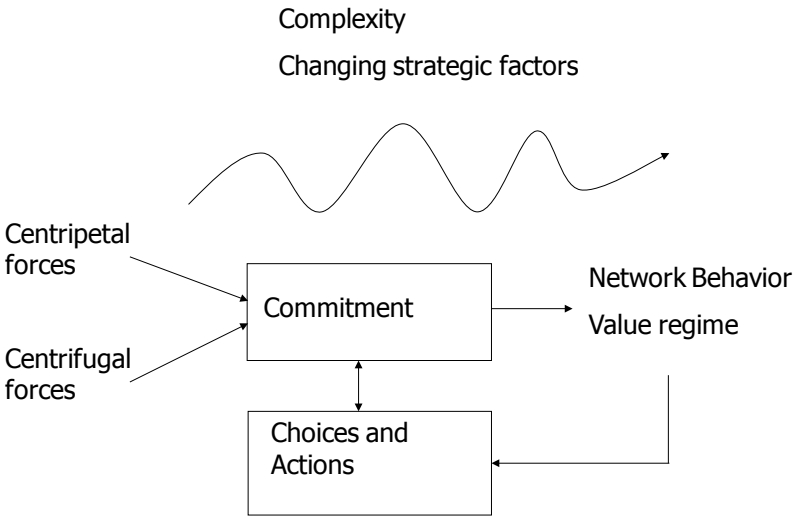


Figure 3.5: Commitments as dynamic capacity to set constraints and boundaries of action

With choices and actions we mean acting while thinking or thinking in action (Schön, 1983). Thinking is based on experience and risk management strategy, highlighting the need to make sense of "turning points" and then mobilising resources to overcome inconsistencies which arise between means and objectives (Thompson, 1967/2003). Thinking underscores these risks in terms of the ability to cope with the complexity inherent in conceptualising "discontinuities" or "transitions" that occur when the *gap* between the requirements associated with contextual conditions and the range of existing knowledge and technology grows (Gilsing et al., 2008; Miller & Floricel, 2007).

Thinking, at individual level, is very much related to resilience, the latter defined as the magnitude of disturbance or sub-optimality that the network can absorb before the network reaches a new equilibrium and structure (Holling, 1973).

By action, we mean experiments and projects that can be defined as how one establishes a new relationship with the future. Experiments take less time than other projects, and allow for some rehearsal and the repetition of some activities that are needed to ensure that all the actors involved in the innovation can feel powerful, and thus avoid the risk of failure (Pisano, 1990; 1991). This is why

experience is of great importance in this approach due to the combination of novelty with some pre-rehearsed components. Experiments combine decision-making and action, exploring the real gap between the existing repertoire of strategies, technologies and knowledge and the needed one, but also to how organisations make sense of it through multiple enactments and perspectives (Weik, 1979).

Orchestrating set steps, "big" or "small," reversible or irreversible, may be different for every organisation. It is also very difficult to establish common ground since the steps to build a path depend on: (1) how the different actors engage in projects; (2) how actors adapt to each other by maintaining coherence in terms of objectives, functions, processes, resources and expectations; and (3) how actors engage and in what type of relationships for co-creation.

3.7.2.- Conflict Management

Innovation is a source of conflict since it unfolds despite current structures (Weik & Quinn, 1999), challenging the status quo and the *forces of equilibrium* (Gresov & Drazin, 1997). Gaps and contradictions normally feed conflicts. Conflict can be defined as a situation in which the different parties are faced with perceived incompatible goals and seek to undermine each other's goal-seeking capability (Thomas, 1976). The main sources of conflict in innovation are related to early triggers of change, such as market shifts, changes in technology, the dissolution of some activities or products (due to lifecycles), new waves or perhaps better ideas that start by creating a difference (Day & Shoemaker, 2000).

As already argued, power is the resource to cope with conflicts in organisations. We consider that conflict is a living thing; in other words, living organizations present conflicts. This is, of course, the opposite view to Taylor's approach to organisational theory which strives for "peace and harmony" while repressing conflict and hiding anomic psychic prisons (Kets de Vries & Miller, 1984; Morgan, 1997).

Conflict starts when minorities detect early signals of change. In networks, executives do not necessarily have a unified view of the firm and express (1)

opposite views, (2) that role ambiguity arises when network management is unclear about partners' expectations and (3) that role conflict appears when priorities among actors clash with one another, thus, leading to a confrontation between conflicting demands (Shenkar & Zeira, 1992). Another important source of conflict is that innovation activities unleash different human emotions and passions - from euphoria (at the beginning), to anger and despair (when confronted with reality and complexity in the middle periods), and sadness (at "the end of the tunnel" phase).

Another way of expressing this is with the idea of how to link the new (what has resulted from the innovation) with the old. Integrative mechanisms are important in an entwined process of adopting the new and letting go of the old. Special managerial ability is required to help people to address the end and "let go" (Bowlby, 1985) due to the heavy psychological investments people normally make in innovations (Sutton, 1987). For example, Sutton proposes organisational funerals and even mourning periods. If people feel that everything represents a loss, with no gain at all, resistance may develop and jeopardise a change program, feeding resentment and anger (Bridges, 2003).

These conflicts add a critical source of divergence for leaders of innovation at the subjective level: this is isolation (Burns & Stalker, 1961). An nnovation leaders will tend to compensate for this isolation by *overplaying or underplaying* his or her role (Burns & Stalker, 1961), that is, following the herd of network behaviour (ups and downs) and trying to establish unilateral control while repressing conflicting situations, stopping any attempt to resolve conflicts through the use of dialogue, and preferring instead to keep potential conflicts hidden (Argyris 1986; 1990; 1994; 2004; Argyris & Schön, 1996).

The opposite of isolation is communication, of course. According to Bohm (1965), dialogue is a critical capacity to hold conflict, "Dialogue is a special kind of collaborative conversation, quite distinct from discussion, which is primarily competitive." Dialogue is a free flowing conversation among people, allowing them to discover insights that they could not attain individually. This communicative capacity is very much aligned with a position of power since it refers to the collection, or absorption and dissemination of information

(Mintzberg, 1998; 2002) by the manager or the appointed people or spokespersons picking the right message, the appropriate channel and the right moment to communicate in a formalised context. This role can also be played by self-elected disseminators willing to reveal their special relationship with management to others, that is, using formal and informal channels.

In line with these arguments, we explore how conflict management is related to boundary management and commitments among leaders in order to examine this variable in the success or failure of innovation networks. Orchestrators can be pluralist leaders and promote co-creative and co-operative resolution. For this, they need to be assertive and authentic, as shown in Figure 3.6. Communication mechanisms can be characterized as: (1) assertive - facing and managing the conflict; (2) buffering - assuming an "as if" attitude towards the organization while maintaining their autonomy and continuing with the project; and (3) adapting to – accommodating – conflict (Thomas, 1976).

I believe that power starts with authenticity, a term which means having "full power over" in Greek etymology. This attitude towards collaborative resolution contrasts with some non-transparent styles and hidden agendas which project an image of manipulation, and another source of power: coercion and arbitrariness, away from the needed commitment to innovation.

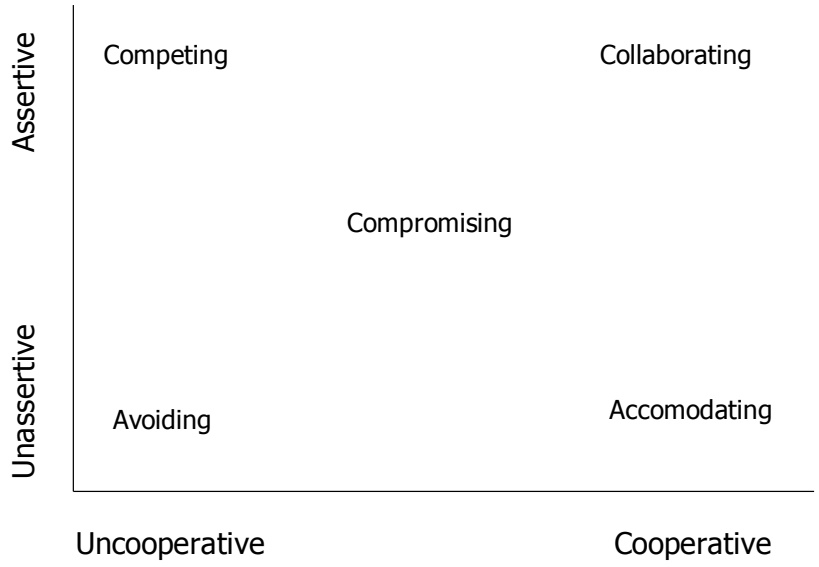


Figure 3.6: Assertiveness and Co-operation (Adapted from: Thomas, 1976)

Commitments may be faced with several paradoxes, since any change process can require a search for new partners or for some relationships to be dropped along the way as a result of disinvestments (Kash & Rycoft, 2000). As Child et al. (2006) argue, "This may of course offend current partners and threaten current trust, if it is not pursued wisely" (p. 410). Relationships may have their own cycles: they may simply end because partners have reached their objectives or because the project has ended.

3.7.3.- Economic capacity

By "Economic Capacity" we refer to (1) the creation of value regimes to generate and absorb value and levels of performance (see figure 3.4), as well as (2) innovation outcomes. The main assumption here is that governance and co-ordination generate super additive sum games in which Orchestration is about expanding the pie (generating lock-in) and taking a bigger piece than the rest by controlling critical resources (Danaraj & Pharke, 2006).

By the same token, Orchestration is also about profitable innovation and commercialising innovations effectively (Chesbrough, 2008). While we pay attention to transaction costs since they are a pre-requisite for network formation

and evolution, they do not explain, for example, how *new investment* policies should be managed since the term "cost" is largely problematic when analysing risks and future events (Augier & Teece, 2008). It thus requires a better examination through the use of empirical cases.

Innovation outcome is the extension of Network behaviour as a dynamic capacity. During the change process choices can be made regarding which resources to develop, what should be recombined and which competences should be discarded (Doz, 1996). We propose to examine *resilience* (not breaking the rules of the game) as an outcome of a process of change. Resilience requires examining how much change the network has absorbed to reach a new equilibrium. In addition, resilience may require (1) re-evaluating the initial conditions; and (2) how much the network members (among whom the network started) have adapted to the new situation. Since research is limited in time, one can set nominal boundaries in the process and analyse resilience as the different balance of centripetal and centrifugal forces, and the new sets of symmetries and asymmetries in deep structures such as (1) members of the network co-creating with complementary equals; (2) a network of weak members trying to gain power in order to confront a stronger competitor; (3) bootstrap alliances in which one or more weak partners tries to reach agreements with a powerful partner; (4) the end of a specific network with the aim of exploring other areas in the future; (5) amicable (or otherwise) separations (or lock-outs) (see Bleeke & Ernst, 1995).

3.8.- Conclusion

In this chapter, I have presented Orchestrating Network Behavior for Innovation as a managerial function. This function is intended to set new paths, through a process-based approach that dynamically manages equilibrium, and is presented as a proposition based on commitments which we assume shape boundaries, roles and relational dynamics. The "outcomes" of innovation are precise changes at the structural level, which lead to new behaviours, and which also feed new structures, and so on. I have also discussed the opportunity to consider resilience

as an outcome in order to assess the degree of change a structure can absorb as its capacity for opening new paths.

Orchestration may then be increasingly important in innovation when uncertainty and complexity increase, making trust, equity and conflict-resolution procedures of capital importance in terms of being able to understand how governance structures emerge, evolve and dissolve over time. In the next chapter, I present the research design to test this function in real settings and continue presenting empirical evidence.

Chapter 4: Research Perspective and Design

4.1.- Introduction

This chapter describes how this thesis is organised, its objectives and design, including the paradigmatic approach, scientific methodology, and operative method. I, as the author, choose dynamic capabilities and strategic management that incorporate ideas from Strategic Management, Economics, Sociology, Psychology and Power (Peteraf & Barney, 2003), including explaining, describing and predicting organisational behaviour. The latter requires continuously updating and refining theoretical frames and expanding knowledge (Peteraf et al., 2008) and the multidisciplinary approach (Pettigrew, 1990).

Orchestrating Network Dynamics for Innovation stresses the importance of understanding organisational processes better, and focusing on the "how" (see Peteraf et al., 2008). In order to address these issues, I first discuss the methodological foundations of this research design. I describe *Abduction*, which was proposed and developed by Peirce in greater detail. This idea is coherent with several nuances within Positivism and Realism (Habermas, 2002) and with the pragmatic approach found in Dynamic Capabilities (Teece et al., 1997; Eisenhardt & Martin, 2000). I then describe the operative method that I have applied in order to obtain the data, as well as the data sources. Lastly, I present the narratives resulting from the empirical research, leading to the presentation of the theoretical construct, an object of this thesis.

4.2.- Paradigmatic Approach: Critical Rationality and Positivism

A paradigmatic approach represents the basic assumptions of the researcher's purpose of activity (research interest), the nature of the examined object (ontology), the relationships with the object (epistemology) and the suitable methodology to examine the object of research. Kuhn (1978) defined two paths for paradigmatic formulation: (1) the stable or normalised path and (2) the exceptional path for upheavals of knowledge. The current status quo – or

normalised view – of Organisational Theory recognises the following paradigms: Positivism, chosen in this thesis, as well as other models based on interpretative approaches such as Critical Theory and Constructivism (Tsoukas & Knudsen, 2003; Guba & Lincoln, 1994).

I choose Positivism as the paradigm since it is based on the *principle of demarcation,* focusing on what is real and what is not (Donaldson, 2003; Popper, 1969). Positivism assumes a realistic approach to the exploration of network structures and boundaries (Conway & Steward, 1990). This approach inherently incorporates nominalist qualities such as the reality *presented* by the researcher in the empirical work, which is held and framed by the intentions and objectives of the research question, without which the data would become meaningless.

Second, the researcher's relationship with reality (epistemology) can obtain knowledge about said reality. One of the major flaws in organisational research is the profusion of a-historical and a-contextual studies, with the risk of incorporating collective trends and researchers' sociological biases (Pettigrew, 1990). I assume that the researcher is a contextualised individual *inside* reality (Hayek, 1949/2009; Rand, 1967), capable of gaining the right perspective and seeing research as a learning process and *as an expression of autonomy* (Vygotsky, 1987; Winch, 1958). This idea emphasises the individual's active differentiation from social co-operative systems (Rand, 1967) and real facts, providing an interpretation in order to construct theory. This can be obtained by a set of empirical and *systemic observations,* and it is the subject of further empirical tests to justify theory building.

This approach stresses the importance of dedicating sufficient time to building a perspective, carrying out research and examining long periods of organisational history and its context (Pettigrew, 1990). Context is critical since it may offer different explanations regarding triggers for innovation and change (Mason et al., 1997). This requires: 1) vertical levels of analysis (from macro to micro levels), and 2) horizontal levels of analysis, referring to sequential inter-connectedness, locating change in the past, present and future times (Pettigrew, 1990; Mason et al., 1997). Change is not predefined or expressed by a set of pre-established

trajectories. It requires the careful examination of context, triggers, organisational structural changes, decisions, and the development of technological solutions (Mason et al., 1997; Weik, 1989), the main objectives of this empirical research.

4.3.- Methodology

In terms of methodology, research on strategy is divided between the "what" and the "how" (Poole & Van de Ven, 2000; Peteraf & Barney, 2003). Processes are intrinsically connected with the creation, extension and modification of the network resource base (Pedersen & Larsen, 2006). In the process domain, research is normally based on the question of "how" and leads to qualitative data and the use of longitudinal cross-case analyses (Vidich & Lyman, 1994; Eisenhardt & Martin, 2000; Eisenhardt & Tabrizi, 1996). Power is very much related to capacities as the ability to perform a particular action in terms of the power needed to carry it out. However, until the action is executed, this power remains latent. As a matter of fact, managerial power, structural attributes and dynamic capacities are sources of power to drive change (Teece, 2009). Here, technology and digital platforms can be seen as a reservoir of potential power, a metaphorical fountainhead from which change springs (see Mason et al., 1997) since these technologies have been proven to be instruments of structural change *from within*, affecting roles, relationships and organisational (and network) boundaries (Lyytinen & Newman, 2008; Pedersen & Larsen, 2006).

In this thesis, I focus on process-like theories at the organisational level, including variables such as dynamism, time, development and outcomes (Petigrew, 1990), thus analysing innovation throughout its entire lifecycle, starting with the antecedents of major changes and examining innovation processes throughout their development (Huber & Van de Ven, 1995; Van de Ven & Hargrave, 2004). This is done to better understand the relationships between power and innovation where digital platforms, as discussed, are conceptualised as instruments or means for change, taking into account their different roles (see Orlikowski & Iacono, 2001).

Taking a process view provides a deeper exploration of innovation processes since: (1) it allows us to examine how processes and outcomes shape each other (Pettigrew, 1990), and (2) it focuses on the "how" and dynamic interrelationships between decisions, the actions taken, and how these influence structural dynamics that address complexities and unsolved previous questions (Eisenhardt & Martin, 2000). This approach is summarised in Table 4.1 below.

Research Design	
Ontological approach	Realism
Epistemology	The relationship with reality is based on autonomy and distance with the object of study, implying systematic observation, contextual analysis and time.
Methodology	Methodological Individualism (avoiding fashionable "social constructions of reality" which may bias reality) Pragmatism. Abduction. A learning process, creative, contextualised and reflexive.
Method	Case Method; objective approaches such as interviews and ethnographic studies
Theories and representations	Process-oriented theory Narratives Managerial Function

Table 4.1: Paradigmatic and Methodological Approach

In the following sections, the theoretical approach developed by Peirce is described in greater detail.

4.3.1.- Abduction

Methodology refers to the method theory applied to research, which, in this case, intends to construct a valid hypothesis regarding the innovation function. I use the methodology defined by Peirce as *Abduction*, "a process of argument with whose aid is to obtain [a] true statement of reality" (Peirce, 1992; Habermas, 2002, page 113). Abduction has been used before in research on Orchestration (see Ritala et al., 2009), since this methodology is used when the existing theoretical development is inconsistent and even contradictory (Ritala et al., 2009). Second, according to the literature reviewed, there is no theoretical work specifically dedicated to Orchestration and network structural change. Finally,

this thesis contains a historical empirical focus, recognising that time is needed to interpret organisational change and requires a careful examination of causes and effects (Zollo & Winter, 2002). In this context, the methodology needs to adapt to reality to better cope with organisational dynamics in order to provide a richer theoretical development (Orton & Weik, 1990; Peteraf et al., 2008).

Abduction combines rational deduction from some hypotheses and tests them with empirical data. At the same time, however, observation leads to an inductive process of theory-building. This, in turn, is based on the critical review of existing knowledge (or theories), the observation of reality and on *expanding knowledge boundaries* grounded in an interactive learning process (Peirce, 1992). Reality exists independently of our observation. However, we make sense of it and we can provide meaning by building new knowledge. Therefore, learning processes should be based on controlled feedback between the accumulation of knowledge, theory-building (a synthesis in the managerial function object of this thesis) and empirical research (Eden & Spender, 1998).

4.3.2.- Method

As already mentioned, the key issue regarding structural change and innovation is the question of "how" they occur. Answering this question in terms of dynamic capacities and innovation may provide a richer representation of organisational life due to its process-based approach (Peteraf & Barney, 2003; Huber & Van de Ven, 1995). Given the exploratory nature of this research, I have opted for a research method that combines ethnography and case study research as a tool for demarcation between the context and the phenomenon (Yin, 2003; Have, 2004). I give special emphasis to qualitative data and empirical analysis, a coherent approach with dynamic capacities and innovation process studies (Huber & Van de Ven, 1995; Dyer & Singh, 1995). Case studies are based on systemic observations and grounded on a positivist approach since they constitute empirical evidence which serves for theory construction (Eisenhardt, 1989). The empirical research of this thesis focuses on two case studies that are described from the protagonists' perspectives, with their own visions of reality which I have endeavoured to respect (Garfinkel, 1967). Likewise, the case study

method is appropriate for this research since I wished to study a contemporary phenomenon within its real-life context, where the boundaries between the phenomenon and the context were not so clearly evident. I also used multiple sources of evidence (e.g., interviews, documents, and observations) in order to eliminate biases (Yin, 2003).

4.3.3.- Units and Levels of Analysis

In order to examine innovation, it is important to define the nominal limits of this research or clarify the researcher's perspective. Assuming autonomy, we carefully need to set "nominal" boundaries to analyse this reality as a complex one (Garnsey & McGlade, 2006). For example, Neo-Classic Economics considers reactive players with zero commitment to economic activities that only build capital, derive its marginal product for an arbitrarily short time period and then resell it. Under such conditions, the choice requires predicting only one thing: price (Garnsey & McGlade, 2006; Augier & Teece, 2009), but not commitments and innovation (figure 4.1). Assuming autonomy in order to better cope with processes and structural dynamics, power dynamics in the preferred choice, more research is needed (Powell & Grodal, 2007; Dhanaraj & Parkhe, 2006; Poole & Van de Ven, 2004). In this regard, I analyse commitments as the main theme and their expressions as centripetal and centrifugal forces to examine structural dynamics, that is, boundaries, roles and relational dynamics.

I also consider other levels of analysis: inter-organisational and inter-personal relationships (the latter among leaders), examining organisational and individual levels of Orchestration (Ritala *et al.*, 2009).

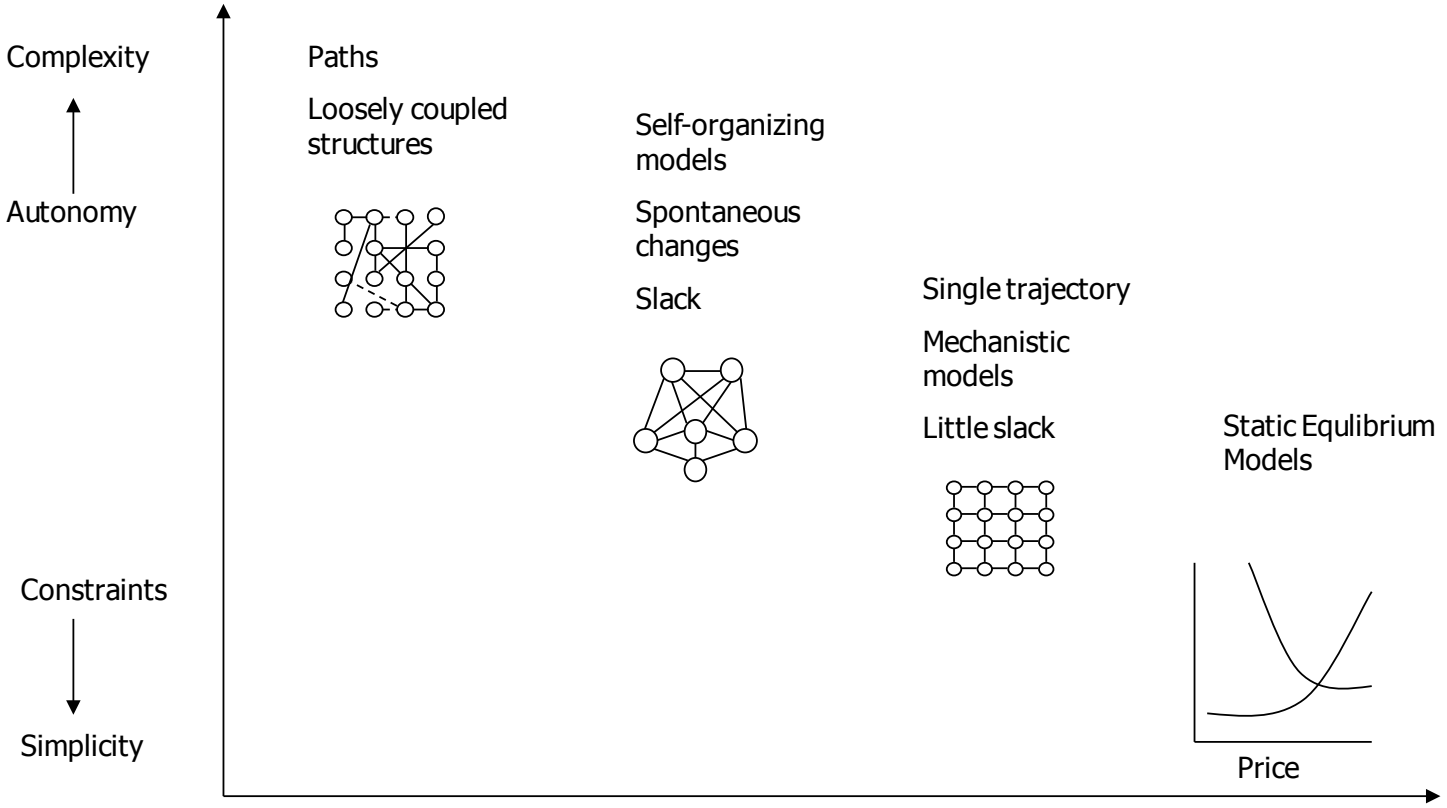


Figure 4.1: Autonomy, "Coupled Levels" and Units of Analysis (Adapted from: Garnsey & McGlade, 2007)

4.3.4.- Paths and Narratives

I explain and analyse innovation and change through narratives. Innovation and technology-based business stories show how entrepreneurs and executives seek to use technology to improve organisational fit and economic gains and how they bring about something new (Mason et al., 1997). Information and Communication Technology-based narratives provide an account of how major decisions and ICT investments are made, revealing how the operations, structures, functions and power distribution of organisations have changed as a result (Mason et al., 1997). This recognises that narratives also help us to understand meta-phenomena, in other words, that organisational change may be a process and an outcome of the innovation process at the same time (Huber & Van de Ven, 1995).

4.4.- Case Selection and Presentation

I have selected cases that cover extreme situations to highlight differences and key variables (Yin, 2003; Pettigrew, 1990; Eisenhardt, 1989:1). I wanted to compare a successful entrepreneurial and innovative focal firm, Multiasistencia, and its evolution from 1983 to 2007 with the same orchestrating phenomenon in a multinational. In the first of these cases, the IBM Barcelona Lab successfully developed innovative software solutions from 1984 to 2004. The cases present important similarities. Their innovations focused on the development of technological solutions such as digital platforms along with network change. The two cases are critical and unusual, and they both include disruptive innovations and major changes in contextual demands and market shifts. In addition, the management of efficiencies such as results, boundaries and domains of action are critical aspects to examine in order to understand their evolution.

In the IBM case, the Lab successfully orchestrated its network from 1994 to 2004. In the cases I focus on digital platforms (Gawer & Cusumano, 2008) as outcomes of innovative efforts, although the main unit of analysis of this work is structural change.

4.4.1. Multiasistencia

During the study period, Grupo Multiasistencia was a leading company dedicated to providing complex services to banks and insurers through its original home insurance claims and repairs services. During the study, the company maintained operations in Spain, France, the UK and Portugal, serving approximately 9,000,000 end customers. It offered its services by outsourcing contracts to 100 banks and it managed a network of approximately 11,000 trade professionals. The firm's evolution spans from its foundation in 1983, to 2009. This Orchestrated Network is European-wide presenting end customers and corporate clients through its Control Centre located on the outskirts of Madrid. From this Control Centre it managed the main process it called its "Comprehensive Claim Management Service" (CCMS). The Centre employed 375 Customer Service Representatives (CSR) who received requests for home repairs by phone, e-mail, and the Internet.

They deployed and supervised jobs to a network of trade professionals who carried out the repairs. Since 2004 on, Multiasistenica has managed a ubiquitous Business Network Operating System (BNOS) based on different technologies such as the Call Centre, the Internet, Web Services, and Mobile Systems. The BNOS incorporates corporate customer demands as turnkey services. All services are audited through Service Level Agreements (SLA) with all the agents in the network. Multiasistencia has boosted its value and innovation by collaborating with its corporate clients in developing new services. Figure 4.2 represents the relationship model and the business network actors with respect to the firm at the end of the 90s when Multiasistencia appeared as the focal firm within this business network. In the 90s, Multiasistencia was very successful in managing groups and attracting corporate clients such as banks and insurers.

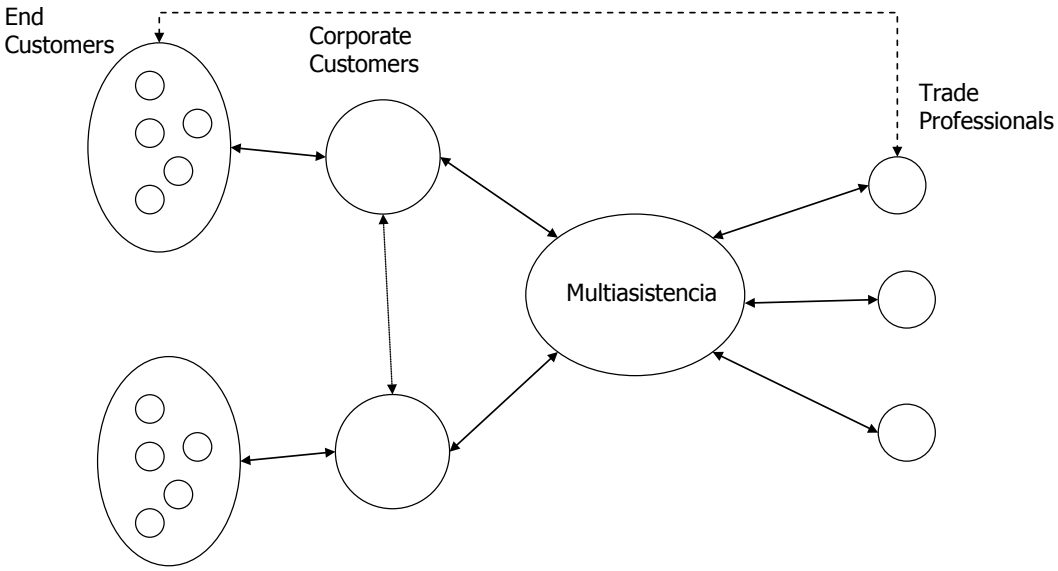


Figure 4.2: Grupo Multiasistencia

4.4.2. IBM Barcelona Lab

The IBM Barcelona Lab was created in 1984 when a group of engineers developed a turn-key application to integrate the PC for one of the most important savings banks in Europe. This project was the basis for the LAN-DP (LAN-Distributed Platform) software product. In 2005, there were more than 1,500,000 licenses for this product used by 1,500 banks around the world. The second phase spans from 1994 to 2004. In 1994, IBM faced one the worst crises in its history. Given this situation, the company needed the LAN-DP application to be transferred to another of its labs in order to develop economies of scale. The Barcelona Lab had to re-invent itself, lowering its centre of gravity and defining itself as open to the customer, thus Orchestrating a Network of banks, other Labs and Independent software vendors (ISV) worldwide pioneering *hybrid programming,* which allowed it to design a new software product in collaboration with its customers: the Websphere Business Component Composer (WBCC). In Figure 4.3 below, I outline the project-based relationship model, the business network actors, and the Lab's central position as the focal Firm.

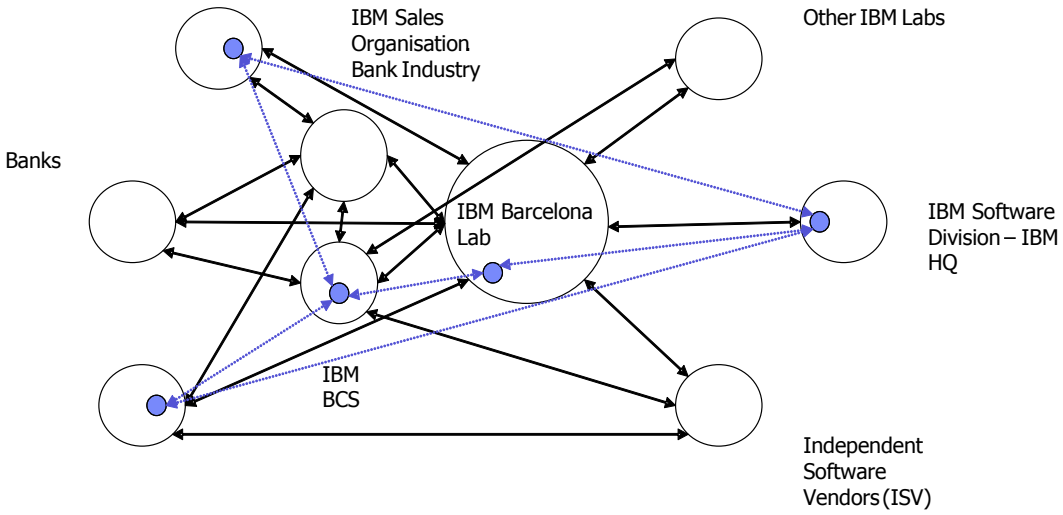


Figure 4.3: The IBM Barcelona Lab as a Network Organisation

4.5.- Data Collection

The main objective of this thesis' empirical work is centred around: (1) structuring action over time; (2) a contextual examination of the diverse relations and dependencies in each context and at different levels of analysis; (3) a comparison between the case studies, with data collection taking place from 2004 to 2007; and (4) a pluralist approach, emphasising the fact that the main sources consisted of interviews, phone conversations, focus groups, observation and secondary sources (Pettigrew, 1990). The data were mainly gathered through interviews with executives and employees at workshops conducted in June 2004, February 2005, and March 2006. The average duration of each interview was 90 - 180 minutes. Managers related their stories of how the change process evolved in their respective firms.

4.5.1.- Interviews

I divided the interviews into three parts: (1) the first was about the company, the type of business, the context and the motivations for change (Pettigrew, 1990); (2) the second was about the interviewee's subjective view regarding the change

process (their stories) and "how" they did it, emphasising the decision-making process with a focus on the activities, the value for the actors, the innovation process and how relationships were established, changed or brought to an end; and (3) the third part was related to strategic issues such as results, organisational changes and resource mobilisation. The interviews were semi-constructed and concentrated on managerial decision-making. Interviews included opposing questions and listening to different perspectives at an individual level, as well as the capacity to lead focus groups to contrast conflicting information.

In addition to the interviews, there were countless telephone calls, conversations, and comments throughout the process, which also allowed me to collect informal data. For example, I was invited to a customer event with two of the companies where I had the chance to share meals, receptions and coffee breaks and spend considerable time with the companies in order to gain their confidence and gather good ethnographic material. I took written notes during these meetings and recorded them by date and subject.

Strategic Profile	Multiasistencia	IBM Barcelona Lab
Chairman	3	N/A
CEO	3	IBM Spain 1
CIO	6	6
Lab Manager	N/A	6
Business Development Manager	2	6
Country Managers	3	2
Production Manager (COO)	2	3
Network Suppliers	2	2
Network Corporate Clients	6	

Table 4.2: Description of Case Data (Number of Interviews)

As Table 4.2 shows, interviewees were selected because of their leading positions in the respective organisations and in the innovation process under analysis. They included initiators of change, those affected by changes, and others external to the focal firm. Another source was focus groups with the different managerial levels. Interviews were prepared and conducted over three years, from 2004 to 2006, allowing them to validate the findings from the case data. Interviews were recorded on paper notes, audio tapes, and 6 hours of videotapes (resulting in two edited DVDs), along with teaching cases for Multiasistencia and the IBM Barcelona Lab.

4.5.2.- Other Sources

The teaching cases also allowed me to invite executives to my classes. This method provided good additional insights from the interaction between these managers and participants. I asked for permission to record these classes (sometimes via an assistant taking notes and others by video recording) in order to be able to analyse and compare these sources of information, and triangulate them with others, both in time and with other perspectives.
One of these cases, the "IBM Barcelona Lab: Orchestrating Banking Innovation" (www.ecch.com) was named *the best case outside the USA and Canada* by the North American Case Research Association (NACRA) in October 2006. The presentation of this case and "Multiasistencia on the Internet (A), (B) and (C)" in 2005 to the same conference allowed me to discuss and check the structure of the cases and their validity with the academic community.

The research process took four years for each case on average. Data collection and analysis occurred iteratively, thus guiding subsequent data gathering (see Table 4.3). In presenting data, I emphasise people's voices. As already stated, other sources included direct observation and secondary sources such as company reports or press releases. With the understanding that every research project has its limitations, I am confident that I have an accurate enough impression of what happened in these firms to understand the process' object of study.

Multiasistencia	IBM Barcelona Lab
• Field notes taken during visits to the company • Press notes and clippings from 1998 to 2004 • Multiasistencia Magazine for their network of professionals and network of clients (2004-2008) • Internal company documents: internal communications, reports, process descriptions, and documentation for software developed • Documentation regarding the company's financial situation • Personal interviews: (1) with company executives: the President, Group CEO, General Managers in Spain, France, and UK, the International Expansion Director, the CIO, the Network Manager, and the COO; (2) With executives in two of Multiasistencia's most important corporate clients: SegurCaixa, belonging to the "la Caixa" Group, and BBVA Seguros; (3) With managers of the franchised repair companies • Focus groups with the Board of Directors in 2005, 2006 and 2007 • Attending client meetings in 2006.	• Field notes taken during various visits to the company • Documentation regarding innovations introduced by the Lab from 1984 to 2004 • Internal company documents: internal communications, reports, process descriptions, and documentation for software developed • Documentation regarding the company's financial situation (confidential and cannot be released) • Personal interviews: (1) with Lab executives: Lab General Manager, the Director of Business Development, the Director of Sales for Banking and (2) With an executive from the "la Caixa" Group • Focus groups: one per year from 2003 to 2007

Table 4.3: Data Sources for Empirical Research

4.6.- Conclusion

In this chapter, I have described the boundaries of the empirical research. The chapter includes objectives and design, including the paradigmatic approach, scientific methodology and operative method. I chose dynamic capabilities and strategic management to focus on the "hows". In order to address these issues, I have described *Abduction*, coherent with Dynamic Capabilities (Teece et al., 1997; Eisenhardt & Martin, 2000) and have endeavored to expand knowledge boundaries to examine the autonomy dynamics or degrees of freedom needed to drive changes affecting network structures. I have also described the operative method that I have applied emphasizing narratives and longitudinal studies. In the next chapter, I analyze the cases presented to examine changes in boundaries, roles and relationships in order to contrast with the propositions described in Chapter 3, where I defined Orchestrating Network Behavior for Innovation as a managerial function.

Chapter 5: Orchestrating and Network Structural Change

5.1. Introduction

This chapter applies the research method to Network Behaviour with two empirical cases, using power as a unit of analysis and centripetal and centrifugal forces to examine roles, relationship dynamics and network boundaries. In order to explore these questions at the empirical level, the strategy followed in this chapter is as follows: first, the present situation is defined and the Multiasistencia and IBM Barcelona Lab cases are analysed, with a focus on their evolving structures (roles, network co-ordination models, integration processes and type of relationships) and their stories as processes. However, to make this simpler, several stages are defined that act as references in the transformational processes which were used for over 20 years in Multiasistencia and the IBM Barcelona Lab.

5.2. Case Presentation

This section presents Multiasistencia's and IBM Barcelona Lab's evolution as a succession of local maximums in an ongoing process of experimentation regarding their respective business approaches, market development, network structures and digital platforms delivered. By comparing these two cases with their dynamic structural change as a path of efficiency for the proposed Orchestrating Network Behavior for Innovation function, innovation process is empirically analyzed, observing Orchestration from the focal firm's central

position. If we observe the empirical phenomena from another perspective and try to imagine the role of Multiasistencia when orchestrating, for example, versus that of IBM, we see how it develops its full potential.

Thus, this chapter presents the analysis of two narratives: in the first, we see the generation and evolution of a network from its origins, the Multiasistencia case, representing a natural way to create firms; in the second, we see a process of network generation and evolution within a global firm that can be framed as a Differentiated Network.

5.3. Multiasistencia

This section describes and analyses Multiasistencia, a focal firm within a network that provides different services for banks and insurers. This case was selected to study different stages within the firm in which to examine the equilibrium, innovation and change throughout its 25-year history (from 1984 to 2009). This period even encompasses the disruptive change from 2000-2003 when Multiasistencia successfully implemented a digital platform. Its evolution reveals optimal and sub-optimal stages affecting the various network relationships and the roles of different. For analytical purposes, we propose a dynamic, five-stage process spanning: (1) the network's initial situation (1984-1995); (2) the boom and expansion of the network (1995-2000); (3) the change in the network (2000-2004); (4) network behaviour promoting innovation as an equilibrium to innovate with information through a digital platform (2004-2008); and (5) the focal firm's introduction of some changes in network governance (from 2008 onwards).

5.3.1-Network Creation (1984-1995)

This phase is defined by an entrepreneur who started Multiasistencia after identifying a structural gap between small customers (hotels and restaurants) and repair services. According to the founder, "What we proposed was to establish criteria for these repairs, guaranteeing a set price and response, consistent service and quality standards" This idea was expressed in the company's slogan and promise in the 90s, "Yes, we can". It was a promise of trust that filled the structural gap and generated a new type of business and a new "repairs market."

Multiasistencia provided its repair service through its International Control and Co-ordination Centre. The Customer Service Representatives (CSRs) working there received the initial call from end users looking for the final solution, in many cases home repairs. Once the claim was accepted, the CSR deployed jobs to a network of self-employed trade professionals, co-ordinated by the focal firm.

5.3.2.- The Network Boom (1995-2000)

Multiasistencia's boom generated increasing returns that acted as a centripetal force, attracting new actors to the network and expanding boundaries. These included banks which wanted: (1) fast access to the new insurance market where time-to-market was crucial and working with Multiasistencia offered this possibility; (2) lowered transaction costs to take advantage of increasing economies of scale; (3) access gained to a very specialized service; and (4) a focus on their core activities. This allowed banks to generate more value by

cross-selling insurance to their home mortgage clients or credit card holders. Trade professionals, by contrast, had access to larger markets, ensuring a constant flow of jobs. Meanwhile, end customers appreciated the 24/7 availability, time guarantees (3 hours for emergencies and 48 hours for the rest) and warranties (3 months). By the end of 2000, Multiasistencia reached 9 million end customers in Europe through 100 major corporations such as banks and insurers that outsourced this service. From 1995 to 2000 Multiasistencia grew from €40 m in turnover to €90 m. Its growth generated important economies of scale, increasing returns and network externalities that increased lock-in.

However, there was a latent and increasingly important asymmetry with trade professionals. In 2000, the network encompassed approximately 11,000 trade professionals. This collective was only 20%-dependent upon delivering the service. There was a "culture of freedom" which hid latent opportunistic relationships during the first phase, serving as a centripetal force so long as the business grew. Nonetheless, as the case shows, relationships based on opportunism can be very cohesive. The attractiveness of the business and the focal firm assumed full responsibility for co-ordination (pushing the actors in the network). There were no clear rules of engagement or commitment and, therefore, no clear boundary setting.

In 2000, the Control Centre needed to make 5.5 calls on average to find an available trade professional. As such, the firm's economic boom also masked an important escalation of increasing co-ordination and transaction costs which drained productivity and finally led to a sub-optimal situation, making it more risky and costly to be a part of the network. For example, productivity dropped

from 1,900 claims/customer service representatives a year in 1995 to 1,200 in 2000. While the Control Centre grew from 100 CSRs in 1995, to 450 in 2000, their activity focused increasingly on searching for available trade professionals and responding to complaints from end customers and banks, meaning that they dedicated less time to developing more business.

In parallel, Multiasistencia focused on innovation and new service development. For example, it succeeded in: (1) reducing the average claim cycle completion from 30 to 5 days; (2) reducing the process for a bank customer to change accounts from 2 weeks to 2 hours, bridging banks with utilities and invoicing providers through an automatic branch office billing service; and (3) linking banks/insurers with trade professionals to carry out repairs through a comprehensive claim management service. One manager explained,

> "Multiasistencia was very creative, but faced what can be described as an invisible glass ceiling: we did not really understand how to control a whole lot of fragmented operations in a manner that was more professional, more automatic."

We can even see Multiasistencia as a focal firm in the *centre* of a network, but one which lacked power since the relational dynamics made Multiasistencia *much more dependent on the surrounding relationships* based on opportunism, thus leading to an increasingly costly structure which jeopardised the business. This was "the invisible glass ceiling."

5.3.3.- Network Change (2000-2004)

New management joined the focal firm in 2000 and decided to change the rules of the game and define a new set of commitments and boundaries with the trade professionals and banks. The management team decided to commit to trade professionals by asking them to do more by themselves while coaching them in the process of: (1) changing their role from that of self-employed workers to managers of small firms of 10-15 professionals; (2) managing a much larger number of repairs; (3) co-investing in software modules (web services) to manage these new businesses (financials and job assignments) which were developed initially by the focal firm; and (4) accepting a new co-ordination schema to a) pull jobs from the digital platforms, as well as digital billing and Service Level Agreements (SLA), and b) leaving the sales process exclusively to the focal firm.

On the one hand, this new schema meant that these newly created repair firms had to implicitly accept sharing co-ordination costs; and, on the other, they had to accept greater dependency on Multiasistencia. However, this new power equilibrium was based on mutual commitment and trust. As one manager added, "The communication policy of sharing our objectives with them was, therefore, an absolutely key factor. There has been a relationship of sharing the objectives and of growing together." However, not all trade professionals accepted these new rules of the game, and from 2000 to 2003, some of the trade professionals left the professional network, thus ending their relationship with the focal firm.

The focal firm's management team also changed the relational dynamics with banks by balancing the centrifugal force of conflict due to dissatisfaction. Multiasistencia's management wagered on "openness" to define a new set commitments. It established agreements with its client banks to co-create the internet solution, the Business Network Operating System (BNOS), among all the network actors. As one manager related,

> "We had a model of relations with these trade professionals which was not very well integrated with them. We offered work and they took it, if they wanted to, and if they didn't want to, they didn't take it. It was much better to reach a level of greater commitment, that is, we undertook to do a series of things, to give them a volume of work, and they undertook to accept it and to carry it out within certain dynamics."

The BNOS was designed to manage claims and process repairs in a fully automated manner, linking banks and trade professionals in real time, and it was governed by 100 variables. Multiasistencia's management asked for a new commitment from banks through sharing the scalability problem, presenting the solution of leveraging digital platforms and asking them to co-create the new digital platform to run network processes. This led to a peer-to-peer type of relationship, creating autonomy on both sides and allowing the co-creation of software modules which combined existing co-specific software applications to build the BNOS. According to one manager, "80% of processes developed were through co-creative processes."

However, in a few cases, Multiasistencia had to create lock-in policies by increasing greater dependency and raising exit costs to keep some corporate customers from leaving the network and consequently losing business revenues. As one manager indicated,

> "We deployed the repair work to the trade professional; previously all these activities were by phone, but by replacing all the elements of the relations, except for the incoming call from the customer requesting the service, with information flows, allowed us to be much more agile, to reduce times, to be much more flexible and to devote the human time to managing the exceptions and the complicated processes,, instead of performing manual tasks which can be carried out more efficiently by a machine".

Their action can be interpreted as exerting autonomy by fostering a *centrifugal force* to change relationship dynamics: the focal firm asked for greater self-control and commitment among network actors, fought against opportunism, and created peer-to-peer relationships. In addition, Multiasistencia enhanced the CSRs' empowerment and autonomy by transforming their role from that of "information chasers" to "process owners." They began by assessing the repair according to the firm's schema programmed on the BNOS. The BNOS was intentionally designed as a boundary management system, establishing a framework or pattern of expected behaviour acting as a deterrent (boundary guardian). According to one executive, "We have substituted all human communicative elements in the repair service, except incoming calls, with machines. We have developed a sophisticated process supported by ICTs, allowing people to manage exceptions." Productivity at the Control Centre

increased by 25% a year from 2000 to 2003, contrasting with the decline of previous years(see Figure 5.1).

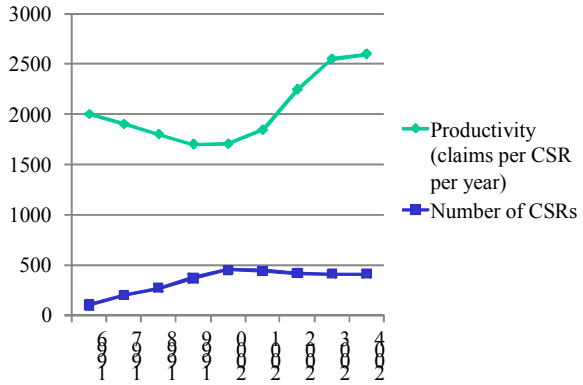


Figure 5.1: Productivity Evolution at the Control Centre

Source: Author based on estimations (1996 to 1999) and data provided by Multiasistencia (2000-2004)

Multiasistencia changed its role to that of *reference* in the Network. One manager commented, "The BNOS had been conceived as a *framework of reference* for network behaviour, freeing up resources to focus on developing new business and innovation." According to another executive, "After the change process, the business was autonomous: we did not need to push it anymore." The change process led to a new equilibrium, giving the network a totally different structure.

5.3.4.- Network Behaviour for Innovation (2004-2008)

At this stage the focal firm managed network boundaries by setting commitments which balanced the centrifugal force of autonomy with centripetal forces of increasing returns and lock-in. Multiasistencia's role was to serve as the reference in a network of innovation, opening space for growth by leveraging the digital platform as a space for co-creation. It also developed trust as a deterrent, controlling network boundaries through SLAs and through the BNOS which automated and kept track of all the processes but also acted as a space for communication and co-creation.

Multiasistencia changed its role from that of "the innovator" which saw the network as an instrument to diffuse innovation, to that of "the reference" (a trustee to identify and share knowledge). It began to look at the network as "the locus of innovation" and became a facilitator to co-create innovation by orchestrating the interaction between the different sources and voices, understanding proposals, composing them and combining them as new services. One trade professional commented,

> "In this process, we learned to adapt to what they [Multiasistencia] asked of us and, in a way, well, we also learned to trust them, to be more transparent and share information to be more agile and do better business."

One bank executive added, "Multiasistencia is very innovative and always proposed new ways to develop new business".

First, CSR interaction with all the network actors served as a new source for solutions. New ideas appeared regarding conflict resolution due to gaps in service provision and the problem-solving process. Moreover, the digital platform provided a history of contacts and data analysis which fed predictive models to mobilize the right resources at the right time. Examples of this were better workload distribution in the Control Centre, process improvements, and increased availability by managing a network of three other Contact Centres belonging to insurance companies in Spain. These insurance companies acted as back-up centres to ensure access during peak periods in telephone traffic or during telecommunication network failures.

Second, corporate customers (banks and insurers) and trade professionals were also important sources of innovation. New software components (web services) were developed by co-creating new services. The digital platform was a space for service innovation and shared investments and network resources, although Multiasistencia continued to be the formal owner of the technology. Examples of this co-creation were, first, digital signatures and electronic invoicing, "desk-top audits" over the internet, allowing loss adjusters to assess claims over the BNOS, and premium services to inform customers through SMS messaging. Finally, Multiasistencia also continued innovating by replicating this model in other markets such as healthcare and public services (see Table 5.1).

Source of Innovation	BNOS Role	Benefits
	Continuous service improvement	
Network Interactions Customer Service Representatives (CSRs) with end customers, corporate customers and trade professionals at the Control Center with the BNOS	**Deterrent Role** Process automation Control variables and Service Level Agreements (SLAs) Automatic Boundary Management and Process Automation	**Increase the Efficiency of Existing Operations** CSR managing exceptions: Proactive quality Increase in productivity by 25% a year (2000-2003) Digital invoices: 40% cost reductions through the reduction of paper work
	Predictive Models Data Analysis	**Predict New Paths for Efficiency** Peak Management and Service availability Service Enhancements
	Co-Create New Services	
Peer Interaction *Software Co-creation*	**Space for Co-creation** **Generation of Economies of Scope**	**New Sources of Income**
	Including digital photos Inter-connectivity with insurance systems and trade professional systems	Desk-top audit: New area of revenue and cost reduction (for network actors), representing 60% of the process
	Premium services and generating SMS messaging	SMS messaging, improving communications with end customers 30% increase in customer satisfaction
	New Markets	
Focal Firm Management	**Fostering Positive Returns** **Generation of Economies of Scale**	**Replication of the Model in Other Areas** Increased business scale throughout (1) the front office; (2) inter-organisational processes and (3) network structuring

Table 5.1: Service Innovation in Multiasistencia's Network

Orchestrating the Network at this stage implied managing a new equilibrium. We can identify the following centripetal forces: trust, higher business value, and the generation of economies of scale and scope. Centrifugal forces at this point might have been misfits at the strategic or resource levels, representing a new cost base for firms which re-defined the logic of transactional costs. In some cases autonomy has also worked as a centrifugal force in terms of the search for new opportunities.

The result was the increasing dependency on Multiasistencia due to growing specialisation and different roles: banks focused on their core business and trade professionals only on repairs, leaving business management to the focal firm. The digital platform was also an important instrument to generate system lock-in and served to generate trust as a deterrent, keeping track of SLAs.

5.3.5.- 2008 to the Present: Towards a Dominated Network

As of 2008, Multiasistencia started to face competition in the very market it had created. Some new entrants, including insurance companies, began to focus more on quality assurance rather than on innovation. Multiasistencia decided to incorporate some trade professional franchises and their staff as special units to ensure top quality for some key corporate customers, developing a hierarchical relationship with them. In fact, Transaction Cost Theory suggests that firms try to control specific scarce resources and that they tend to in-source them (see Williamson, 1994). This approach seems insufficient, according to the data, to fully interpret managerial decisions in fields such as this where more research is needed.

5.4 Case Study: IBM Barcelona Lab

This section describes and analyses the IBM Barcelona Lab as a focal firm leading software development for middleware integration between the front office and the mainframe. This case was selected to study different stages within the firm to examine the equilibrium, innovation and change throughout its 25-year history (from 1984 to 2009). This period even encompasses a disruptive change from 2000-2003 when IBM Barcelona Lab opened up software development to its customers as "an open lab." Its evolution reveals optimal and sub-optimal stages affecting the various network relationships and the roles of different actors. For analytical purposes, a dynamic, four-stage process is proposed that spans: (1) the network's initial situation (1984-1994); (2) change in the network (1994-1996); (3) network behaviour promoting innovation for the development and deployment of a digital platform (1996-2004); and (4) when the IBM Barcelona Lab became a Competence Centre (from 2004 onwards).

5.4.1. Network Initial Conditions: The PC in the Bank Branch

IBM Barcelona Lab started its days with one relationship with a bank for a specific project. In 1981, IBM launched its personal computer (PC). By 1984, the new product, named PC-AT, was the central computer used for application development in the special projects that the banking team was working on in Barcelona. However, the "la Caixa" savings bank in Barcelona, and other institutions in Spain, insisted on IBM in Spain leading the change, that is, introducing PCs in their branch offices to reduce IT costs.

IBM executives proposed partnering and developing an *investment project* between IBM in Barcelona and "la Caixa", informally planting the seed for open innovation through this relationship which changed from a provider/customer relationship to one in which the actors co-created something new together. The project was a good example of autonomous action, since it was launched without following the formal procedures at IBM regarding software development. The plan involved a pilot project that would allow a prototype to be designed locally, based entirely on "la Caixa" and IBM resources in Barcelona. This project was very successful and later became a standard solution for many financial institutions. It was called *Financial Branch System Services (FBSS)*.

As a result, IBM decided to formalize this innovative venture, this change of role, by converting it into an R&D laboratory for banking applications in Spain, known to its staff as the Barcelona Lab or "the Lab." In 1993, seven years after it had come into being, the Lab had consolidated its position and had more than seventy professionals on staff. In 1994, LAN-DP had 500,000 licenses world-wide. Thus, the product was entering its mature phase.

5.4.2. Network Change (1994-1996)

In 1993, IBM announced the most negative results in its entire history, 8 billion Dollars, and its market capitalization plummeted from a high of $105 billion to $32 billion. Given this situation, the company's corporate management, presided by J. Akers, proposed that IBM be split into seven separate companies to save it from bankruptcy. However, in 1993 when Lou Gerstner came in as CEO, his primary objective was to keep the company together as a single unit.

Only twelve months later, in 1994, and in an unprecedented turnaround, the company announced profits of 3 billion Dollars.[2] The main decision was to shift its orientation from products to service. A result of this new orientation was IBM's decision to create IBM Global Services (IGS) as the firm's new Consultancy Division. After the turmoil in 1993, IBM began to offer its customers integral solutions.

However, there was a latent and important asymmetry with the rest of IBM, as in any other hierarchy. The attractiveness of the business around LAN-DP determined that IBM Barcelona Lab assumed full responsibility for software production where there were no clear rules of commitment with the rest of Software application groups. However, due to market shifts and new technological waves, it was decided to re-structure the whole organization. In June 1994, IBM underwent heavy cost optimisation that also had repercussions for its laboratories policy, particularly the smaller European units in Vienna, Rome, and Barcelona. This new policy led to the decision to discontinue Barcelona Lab's operations. As a consequence, the Leader who had run the Lab since its foundation resigned.

In the uncertain times of 1993 and beyond, IGS in Spain offered many of the Barcelona Lab staff a natural outlet for their professional careers. There was a constant movement of people switching from the Lab to IGS. It was more appealing to work on particular projects integrating this new technology than to wait for the unknown. By the end of 1996, the Lab had less than twenty staff members, and many had opted to join the new IGS consultancy unit.

[2] Gerstner, L. (2002). *Who says elephants can't dance?*. New York: Harper Collins.

5.4.3. Network Behaviour for Innovation (1996-2004)

A key aspect was boosting collaboration with the Sales Banking Organisation in Spain. When the risk that this small team would be definitively incorporated into the Consultancy Organisation was at its height, the Commercial Banking Organisation and IGS identified several projects for them in various financial institutions where the disruptive technology which became known as the internet was appearing. The new management team proposed a centripetal force: (1) developing a Lab that was open to its customers to carry out innovations based on internet technologies and (2) exerting autonomy by re-thinking software development through engaging in direct relationships with customers, that is, banks aligned with new lab strategy. According to one executive,

> "We focused on finding banks that worked globally and had to face global challenges in integrating their business processes and their technological assets. The Lab's origin lay in being close to customers; therefore, I decided to take advantage of this capability by opening the Lab up to customers."

IBM Barcelona Lab also changed its role(as Multiasistencia did), from being the "the innovator" and perceiving the network (in this case IBM and their customers) as an instrument to diffuse innovation to *understanding the network as the locus of innovation,* and becoming "a facilitator" to co-create innovation by orchestrating the interaction of the different sources and voices. As one Lab member related, the Lab was no longer like an Ivory tower, since

they had moved its gravity centre towards the customer. On the other hand, as argued, a new trigger appeared in the context: Internet technologies were rapidly evolving, and thus it was easy to find key customers willing to innovate with this type of technology, that is, who wanted to take advantage of the Lab's know-how. The merit was based on its early detection, and very rapidly a new set of commitments and a new method of organisation. According to one executive, it was a,

> "A matter of capturing the existing innovation needs of each of the clients, making them reality and co-creating a solution with the client. As a result, we had key people in key projects."

The IBM Barcelona Lab exerted autonomy, staffing "key people in key projects" from IBM and from banks, and dealing with the leaders like technical architects or sales people. In the Lab, it was quite the norm for a professional who was working in development to then move to the project group at the end of the development phase, later going to the client to implement or start up a project based on the product that he or she might have developed personally. The Lab not only exerted autonomy, it generated a new capacity to attract even IT banking staff. As one manager commented,

> "And at some point I *took a gamble*, because we needed project directors from the banks in the laboratory. And without a doubt, that has been one of the wagers that has given the best results."

The Lab also implemented a new way of developing software that shaped its very structure. In other words, the related tasks shaped ties and structures

while these relationships also forged trust and commitment which, in turn, shaped new tasks. The Lab was shaped like a daisy, where project teams rotated with software development teams in different projects, analysing, diagnosing and building software solutions. One of the Lab members stated,

> "This results in plans being changed. People have to be dynamic, flexible, and know how to adapt to these changes. I would say that this is a little difficult at first; basically, professionals prefer to know very clearly what is expected of them, exactly when and how. And as soon as they get used to that dynamism, to that flexibility, they take it as a routine part of their work."

The capacity to rotate from software development to project management even to business development was considered to be a part of the Lab's tasks, thus "avoiding repetitive or routine activities," according to one manager. Indeed, experimenting entered a flow of ongoing ideas and invention, a combination of accents, changing harmonic patterns that would inter-weave the structure of relationships and networks. As a manager indicated,

> "So, we put *key people in key projects*. In graphic terms, the organisation was like a flower. Its centre was formed by the core competences: Product functional development and innovation. The petals of the flower were formed by specific customer projects."

The purpose of the first line (the project teams) was to define solutions to meet customers' needs. In this context, it was the intermediary's job to define which

part of the project could be recycled. The Lab developed new roles in the network.

As discussed previously, in the IBM Barcelona Lab case, the Lab's boundaries, roles and relationships also changed. Until 1993, the Lab's knowledge base was focused on software development. By engaging in project management, it developed its business development capacities – as executives in the Lab called it. Therefore, the Lab became less dependent on the willingness of sales departments to sell their solutions. This is an important issue in multinationals such as IBM, where product and sales catalogues are vast and product divisions dedicate part of their resources to sell products to sales forces. In this case, the IBM Barcelona Lab's Business Development team did not compete, but was much closer in order to control the sales process in IBM.

The IBM Barcelona Lab deployed Internet applications to integrate new channels and, as a result, developed its Websphere Business Component Composer (WBCC), a modular software architecture to integrate multiple contact channels based on re-using existing components and creating new ones. In addition, these technologies became richer and increasingly complex, adding more features and easier access to transactional systems. This allowed for some of their other services to be increasingly available, including requests for accounts, transfers, and managing payments.

According to one executive, "WBCC was a "component composer" that gave *more autonomy to customers*, letting them build new applications, re-use and integrate them with existing applications" affecting multi-channel strategies.
As one manager declared, "In essence, software projects were thought of as the development of re-usable components"- Additionally, project teams

synthesised knowledge into interconnecting software modules which were the foundation for the modular architecture that became the WBCC launched in 1998.

IBM Barcelona Lab orchestrated different sources of innovation (Table 5.2). Banks were important sources of that innovation. New software components (web services) were developed, co-created and combined with existing IBM technology. WBCC was a space for innovation and shared investments and network resources although IBM continued to be the technology's formal owner. Finally, IBM, as a corporation, took advantage of the WBCC technology to continue innovating by escalating this model to other industries, as well as re-framing its relationships with customers.

Source of Innovation	WBCC Role	Benefits
Continuous service improvement		
Network Interactions IBM Lab staff interaction with Banks, other IBM Labs, sales force and Independent Software Vendors (ISV)	**Deterrent Role** Service Level Agreements (SLAs) for software delivery Standards	**Increase the Efficiency** Time to Market: from 2 years to 6 months Customer Satisfaction
Co-Create New Services		
Peer Interaction *Software Co-creation*	**Space for Co-creation** **Generation of Economies of Scope**	**New Sources of Income**
	Inter-connectivity between multi-channel front office with Mainframe Multi-disciplinary teams (banks and IBM Lab staff)	New integration projects Replication of cumulated knowledge in new customers Transferring knowledge to other IBM Labs
New Markets		
Focal Firm Management of the differentiated network	**Fostering Positive Returns** **Generation of Economies of Scale**	**Replication of the Model in Other Areas** Value absorptive capacity by IBM as Corporation IBM as diffusion network (e.g., 1.500 Banks use LAN-DP)

Table 5.2: Innovation in IBM Barcelona Lab's Network

5.4.4. Becoming a Competence Centre

At some point in 2004, IBM decided that, to increase productivity, the basic programming could be done from its laboratory in China. This would result in greater programming productivity and cost reduction due to off-shoring policies. The Vice-President of the Banking Industry in EMEA summed up the situation in 2004 as follows,

> "IBM Barcelona Lab was essential for our competitive strategy in the Retail Banking sector not only in Spain: It was a key competitive advantage in our European and global operations. The Barcelona Lab demonstrated high organisational flexibility, and its hybrid programming techniques were very useful for the incorporation of new applications, reducing time-to-market and making it easier to share knowledge and enhancing collaboration between the Lab, the sales organisation, and the clients."

IBM decided to capitalise on the extensive know-how of its workers, although not as much in terms of technology as in terms of solutions for the financial system, transforming the software laboratory into a skills or competence centre. As one manager argued,

> "The laboratory and skills centre motto has always been that we should "reinvent ourselves." But I'm also convinced that within four or five years we're going to have to dream up the next step. We are always going to be there next to our clients, because the other part of the motto is "this reinvention will only be possible if we are close

to our clients' projects", and not like the shut-away or isolated laboratory concept, which is very out-dated. That would never work, we will carry on reinventing ourselves"

5.5.- Propositions

This chapter has contributed to the discussion on dynamic capabilities and power by defining and testing *Orchestrating Network Structural Dynamics* empirically. Grounded on the foregoing analysis, this chapter presents the propositions which are described in the following sections.

5.5.1.- Orchestrating Networks: The Dual Nature of Power

Proposition 1: *Orchestrating Network dynamics for innovation balances autonomy and cohesion through dynamic commitments as a power expression of managerial action.*

With this proposition we argue that Orchestration, by nature, exerts power in two ways. First, it is about setting direction and opening new spaces. In the cases studied, this occurs by exerting autonomy to network actors. More autonomous actors may make new choices to search for complementarities which the orchestrator can then mobilize and make the network the "locus" of innovation. In the Multiasistencia case, it works as a change process. In the IBM Barcelona Lab case, it is the result of "open[ing] the Lab to customers"-

Both cases show networks as multi-connected and multi-disciplinary spaces of new relational dynamics which can combine and re-combine new sources for innovation such as: (1) autonomous staff focused on *problem-solving*, stemming from the interaction with other network actors and with information systems such as the digital platforms; (2) the *co-creation* and development of a digital platform based on peer-to-peer dynamics; and (3) the re-design of network structures through the capacity to engage in *new communication* schemas.

The second source of power is setting commitments. Innovation requires trust since actors need to expose themselves and unfold new sources, propose ideas and combine them into co-creative activities. In addition, this process emphasises that orchestrating is about *holding* conflict at bay, since autonomy stresses doing more by oneself, having self-control and less dependency on the power of others but also assuming the risk of having different objectives and perspectives. To that end, commitments among actors are about taking care of each other and maintaining an ongoing equilibrium to not break up network structures (even during deep structural changes), and, therefore, create an efficient path for innovation.

Orchestrating through commitments is about changing the rules of the game and keeping the game alive. This approach presents networks as a more natural way of organizing, thus challenging the Neo-Classical perspective of relationships as transactions- which presents many limitations for innovation studies (Teece, 2009)- and dismissing other human attributes to deal with innovation and cope with radical uncertainty. Compelling antecedents can be

found in Psychology or even in classic narratives to support commitment as the force to link networks of innovation. First, among mature and autonomous individuals, commitment is the capacity to care for each other (Bowlby, 1962), assuming consciousness and self-control to choose and set relationships, thus recognising the dependencies that actors' have on each other in a network. The second antecedent is found in Elster's Theory of Binding Rationality (see Elster, 2000) as argued above. In Multiasistencia, orchestrating through commitment contrasts with the opportunism which was previously the source of latent conflict and, paradoxically, served as a centripetal force. This confirms that some social dynamics can be very cohesive but, since they may hide asymmetries, they are incompatible with co-creative processes of innovation. Partnering, creativity and autonomy lay behind IBM Barcelona Lab's idea of "key people in key projects" which sees areas of innovation in particular settings, developing the right staffing policies and generalising what is specific and a market trend.

Orchestrating also implies taking actions in those cases which led to some relationships being dropped while new ones were built, recognising that not all actors in a network can be interested in or have the capacity to establish commitments. Moreover, in the cases presented, commitments were determined precisely in sub-optimal regimes, emphasising how trust is a necessary resource that orchestrators have to foster in order to manage investments in situations where, for some actors, the costs and risks may be greater than the short-term benefits.

5.5.2.- The Dynamics of Co-Creation

> ***Proposition 2:*** *Orchestrating innovation in networks has a positive influence on maximising outcomes when commitments lead to peer-to-peer relationships among autonomous players.*

This proposition emphasises that orchestrating is a different way of exerting power, leading to different network structures based on peer-to-peer relations. Being peers seems to be the prerequisite for co-creative activities, according to empirical results. This requires the existence of complementary assets to exchange and create something new. This dynamic affects both actors' roles and the network boundaries.

Actors become more specialised, gaining *greater differentiation* and establishing a new division of labour. In Multiasistencia, the new network structure stressed complementarities but also relational co-dependencies, since trade professionals needed to focus on their repair work, being more dependent on the sales process and market development carried out by the focal firm. The result was that tradesmen and the focal company balanced their relationship. By the same token, banks needed Multiasistencia's service quality to expand their customer business value. This is also consistent with the proposition that, in order to establish a new equilibrium, firms may create greater specialisation and differentiated resources (Wernerfelt, 1984). In the case of the IBM Barcelona Lab, this implied: (1) the capacity to co-create new software solutions; (2) the ability to leverage "external" and "internal" resources to do so (in other words, the "slack" was provided by the first

customers to carry on with the project); and (3) the capacity to integrate new technologies in the existing bases already installed.

In the Multiasistencia case, power, as expressed by exerting autonomy and managing commitments, led to a new set of social values such as the policy of "growing together," implicitly recognising economic value generation and absorption processes. The focal firm also asked its Customer Service Representatives (CSRs) to become "process owners" and to co-create, co-produce and exploit new services based on the co-operative software developed with banks. Multiasistencia gained autonomy as the focal firm, inviting those who did not accept the new schema to leave the network. The new game was now a question of not only sharing benefits, but also costs.

Tables 5.3 and 5.4 below summarise the empirical study of both cases and their respective structural dynamics affecting the roles, relationships and boundaries by balancing centripetal and centrifugal forces. Also stressed is the role of ICTs due to their importance in the dynamics of both Networks.

	Initial Network Conditions (1984-1994)	Network Boom (1995-2000)	Network Change (2000-2003)	Network Behaviour for Innovation (2004-2008)	Towards a Dominated Network (2009-
Focal Firm Role	Bridging a structural hole	Attempt to be the strategic apex	Management of new commitments	Reference for innovation	Strategic apex
Relationships	Asymmetric (1) Contracts with customers (2) Latent opportunism with providers	Asymmetric (1) Explosion of opportunism among providers (2) Lack of trust and quality in service with banks	Balancing relational dynamics through boundary definition and commitments. Some new relationships created, others are dropped Trust as a deterrent and calculative	Commitments (peer-to-peer) towards co-creation and complementarities for co-creation Trust builds knowledge and identification	Hierarchical control over providers
Boundaries as centripetal vs. centrifugal forces	Promise to customers "Yes, We Can" Not defined with providers	Centripetal forces prevail: Boundaries expanding due to business growth, externalities, increasing returns, "follow the others" and "latent" opportunism	Management exerts autonomy as a centrifugal force vs. the centripetal force of opportunism (and its over-embeddedness)	Commitments balance centripetal forces (increasing returns) and centrifugal forces (autonomy)	New balance under study
ICT role	Operational support	Source of new income and innovation	Co-creation of a BNOS	Automatic boundary control (deterrent) and space for co-creation (knowledge based)	To be analysed

Table 5.3: Orchestrating Network Structural Dynamics in Multiasistencia

	Initial Network Conditions (1984-1994)	**Network Change (1994-1996)**	**Network Behaviour for Innovation (1996-2004)**	**Competence Centre (2004-)**
Focal Firm Role	Bridging a structural hole	Management of new commitments	Reference for innovation	Reference for innovation
Relationships	Asymmetric (1) Commitments with Customers (Banks) – some of them latent after project ending (2) Agency-based with IBM as a Corporation – latent asymmetry and opportunism?	Balancing relational dynamics through boundary definition and commitments. Trust as a deterrent and calculative	Commitments (peer-to-peer) towards co-creation and complementarities for co-creation Trust adds knowledge and identification	Commitments (peer-to-peer) towards co-creation and complementarities for co-creation Trust adds knowledge and identification
Boundaries as centripetal vs. centrifugal forces	Centripetal forces prevail: Boundaries expanding due to business growth, externalities, increasing returns and "latent" opportunism	Management exerts autonomy as a centrifugal force (Key People in Key Projects) vs. the centripetal force of opportunism (and its over-embeddedness)	Commitments balance centripetal forces (increasing returns) and centrifugal forces (autonomy)	New balance under study
ICT role	Source of new income, new types of relationships with customers and innovation Co-creation of LAN-DP	Project-based, ad-hoc solutions	Co-creation of WBCC	To be analysed

Table 5.4: Orchestrating Network Structural Dynamics in the IBM Barcelona Lab

5.5.3.- The Orchestrator as the Network Reference

> ***Proposition 3:*** *A focal firm can act as the network reference, influencing dynamic boundary control and trust in the network.*

In this proposition, it is important to point out the structural attributes of the focal firm which act as a yardstick for innovation, capable of exerting power and strategic control on a peer-to-peer basis while maintaining the rules of the game. Although the role of peer-to-peer interactions in innovation is underscored, in the Multiasistencia case, the focal firm strengthened its central role and maintained ownership of the digital platform, thus controlling a strategic resource to keep an asymmetrical power balance with respect to the other actors, although it also maintained its capacity to generate commitments. It is important to note that the focal firm changed its role as well as the network structure and its function in the different periods analysed. In the first phases (1984-2000) the focal firm's power was based on concentrating innovation and trying to control the network as a tool to spread its innovations. During the sub-optimal regime (2000-2004) the focal firm's way of exerting power was to exert autonomy, opening new spaces and establishing new commitments. In this transition, the focal firm proposed a new game and changed the rules of that game, balancing relational dynamics. From 2004 to 2008 the emphasis was on co-creative activities to design and implement new services. Here the focal firm exerted power by increasing its centrality as the reference for innovation, controlling resources and opening new spaces, thus rolling out dynamic capacities.

I also propose that the role of reference to manifest commitments and deal with changes can be assessed by resilience as proposed in Chapter 3. In both cases (1) members of the network adopted a co-creative activity with complementary equals (2) focal firms gained power in order to confront asymmetries (3) partners reached agreements with a focal firm (4) amicable (or otherwise) separations (or lock-outs) were reached and (5) a specific structure was ended with the aim of exploring other areas in the future.

5.6.- Conclusions

This chapter has analysed Orchestrating as a managerial function to set a new path of efficiency, managing a process of ongoing equilibrium between the actor's benefits and costs which can vary along the way, stressing that setting a path is "changing the rules" while keeping the game alive. Orchestrating Network Behaviour for Innovation is about power: on the one hand, opening new sources of innovation and, on the other, setting commitments which shape network boundaries. This issue has been stressed, particularly in sub-optimal regimes, therefore resilience is proposed. In this respect, management is about dynamically regulating boundaries through centripetal and centrifugal forces in accordance with objectives and circumstances which can also shape roles and relationships.

Therefore, Orchestrating Innovation is an ongoing process to change network structures to manage the players' autonomy and peer-to-peer relationships for co-creation, sharing investments and engendering trust. This leads to network behaviour for innovation and the development of new opportunities. In turn, the latter leads to a "multi-connected" network, emphasising value regimes based on equity, holding conflict, and organizing forward. This serves to highlight: (1) the autonomy and the predominant relational model among the actors in the network (whether hierarchical or peer-to-peer); (2) the locus of innovation, that is, if innovation is centralised and the network's main function is diffusion or if the focal firm is the reference to generate novelty by orchestrating new sources that come about in the network; and (3) how the focal firm fosters communication within the network. Information systems and digital platforms have been highlighted, in particular, as a proxy for commitments and also as a communications system and a creative space. Creativity in social settings may be part inspirational, but it also requires perception and communication in order to become a structural process.

In Chapter 6, I analyze the "optimum state" found in both cases in more detail, where the focal firm orchestrated innovation through peer-to-peer relationships, co-creation and the capacity for opening new spaces and sources of innovation,

which allowed it to have the capacity to set new paths due to multi-connectivity, find new experts, end and establish relationships, and develop new digital platforms; a critical infrastructure for innovation as I shall explore in the next chapter.

Chapter 6: Orchestrating Generative Networks of Innovation

6.1. Introduction

This chapter elaborates further on the optimum condition for innovation when Orchestrating Network Behaviour for Innovation engaged in co-creative activities. There is evidence in the Multiasistencia case from 2003-2008 and in the IBM Barcelona Lab case from 1996 to 2004. This formula offered maximum results and outcomes by opening up a space for new voices and new sources of ideas (see Tables 5.1 and 5.2 in chapter 5) which complemented and re-combined with each other, to create novel results with an important economic impact on the co-creation and exploitation of digital platforms as innovation infrastructures.

This chapter presents a framework that describes commitments assumed by the focal firm in the network and compares them with exploitation and exploration factors by comparing the two case studies. In the following subsections, these issues are discussed and the cases are analysed with an emphasis on the network as an ecosystem for co-creation.

6.2. Generative Networks: A Framework of Commitment

Generative networks are expressions of optimality, and rely on Orchestrating through commitments, trust, and a symmetric (peer to peer) model of relationships for co-creation. Generative networks also represent an optimal configuration as network behaviour for innovation. The orchestrator exerts autonomy, opens space for new sources of innovation, and boosts communication between actors. Digital Platforms provide an infrastructure for innovation, giving *more autonomy to actors*, and letting them build new applications to re-use and integrate them with existing applications and

components in order to build more integrative solutions (in the IBM case) and new services (in Multiasistencia case). Autonomy is expressed with the proposal of new projects, to come up with software projects thought of as the development of re-usable components, or in other words, a re-combination of existing resources to expand the resource base, as dynamic capacities suggest. Additionally, we have shown that project teams synthesised existing and new knowledge into interconnecting software modules which were the foundation for the modular architecture of digital platforms.

With this approach, it is pointed out that, on the one hand, the network is the locus of innovation, stressing that Orchestrating is a network capability (dependent on sources of innovation), not only a question of the focal firm. On the other hand, Orchestrating is about opening and managing new sources with, (1) network interactions among actors; (2) spaces for co-creation and generation of new modules/applications/services and generation of economies of scope; and (3) the replication of existing models in new markets, industries and areas (see chapter 5). In both cases studied, the focal firms detected significant inefficiencies within the banking sector's business processes due to their profound knowledge of business and administrative processes in the industry. Given the common problems and broad applicability of these processes, both focal firms quickly found (1) economies of scale and externalities that helped apply their digital platforms to other sectors of the economy with some modifications as well as (2) economies of scope, becoming "innovation factories" for complex, process-intensive information services, balancing greater scope or breadth versus greater focus and specialisation. It is suggested that sources of innovation are dependent on the way commitments are set and their impact on innovations (from exploitation to exploration). To that end, we define the three key modes:

(1) A new business dominant logic, that is, new business models and market creation, as a result of irreversible commitments led by the focal firm.

(2) Co-creative activities and mutual commitments and adaptation among actors at the technological and organisational levels to ensure resource and strategic fit. Mutual adaptations are basic constituents of loosely-coupled structures.

(3) Digitally enabled commitments, which include programmed information systems with the capacity to assimilate programmed limits of action and provide new functionalities based on data analyses and predictive modelling. With programmed changes, we consider that some automatic responses can be the result of dynamic models of data analysis such as new business intelligence technologies.

These three modes are at the heart of the governing function and also imply mobilising resources, for which we present empirical findings. However, two additional processes are included: one related to high levels of commitment and exploitation, and the other to low levels of commitment and ICTs used for exploration. The fourth mode might be: Dominant (existing) business logic through which networks can show persistence or attachment to previous commitments. The reasons for "persistence" must be carefully analysed as they can be the result of previous commitments or be due to chaotic behaviour, that is, the absence of clear previous constraints or boundaries that can lead complex systems to assume deterministic paths.

Finally, a fifth mode may be possible due to the exploitative role of information systems. Although theoretically possible through "artificial intelligence," this mode would require much more research (and time!) since this question is on the boundary of science. Maybe one day computers and information systems will make commitments, choices and judgements. While this may become possible in the future, it is far from being a reality today. These two modes 4) and 5) are presented to argue that commitment and the level of exploration are independent variables. Exploitation and exploration refer to the scale of the innovation and also the resource mobilisation required, that is, the money and investment, the new relationships andgetting out of old ones, etc. Orchestrating recognises that the greater the organisational capacity, the greater the scale of change (Orlikowski, 1996). This approach to adaptability can be synthesised in the following figure.

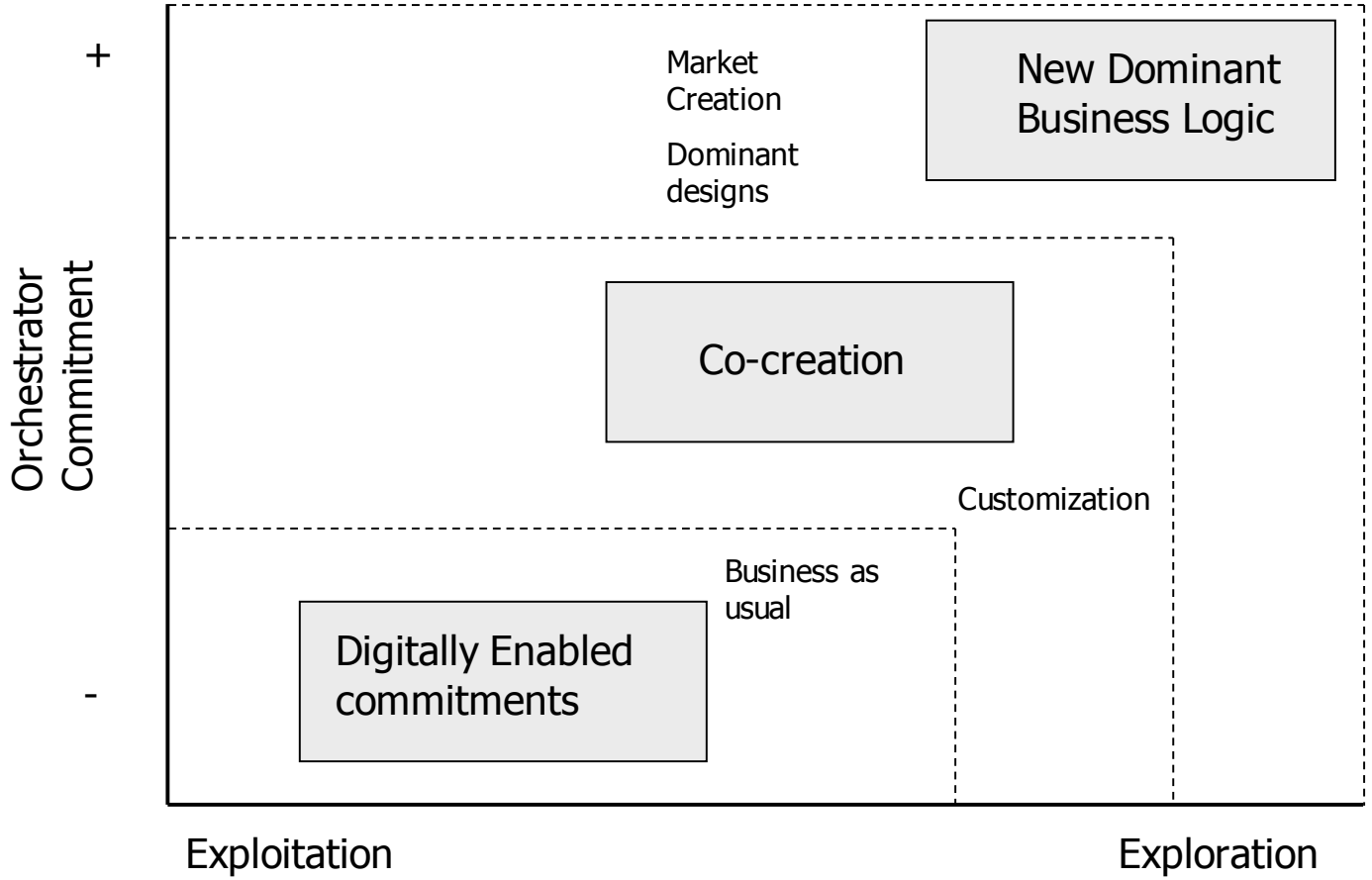


Figure 6.1: Modes of Commitment for Innovation

6.3. Dominant Designs and Business Models

The first mode is related to *irreversible commitments*, that is, situations where there are few choices and they are leapt into, providing for consistent behaviour which maintains organisational consistency with respect to these choices. This thesis has presented innovation dynamics towards *dominant designs* which can be defined as knowledge that crystallises from: (1) an innovation path, which implies (2) different choices and actions that set this path (3) marching in line with the articulation of preferences. Both the IBM Barcelona Lab and Multiasistencia epitomise these dominant designs with the co-creation of the two digital platforms. In turn, these led to the creation of new markets for "middleware integration" at IBM and "repairs" in the case of Multiasistencia.

In both cases, findings show how digital platforms are associated with new dominant business logic, giving these firms a "referential power" and the capacity to control digital platform developments or their ownership. This is consistent with previous research, since new dominant designs are related to new hierarchies (Van de Ven & Garud, 1993; Utterback & Suarez, 1993; Suarez, 2004)

This discussion is also related to recent proposals in the literature such as linking Orchestration and dominant designs with market and factor creation. In the early stages of any industry or market development, product designs and organisations tended to be organic, with no clear definition of rules, roles and boundaries (Burns & Stalker, 1961), thus permitting networks to be seen as natural ways to describe the stages where investments and co-creation seem to be critical aspects as well as Orchestrating managerial capability.

Centripetal forces lead to super-additive games that serve to: (1) attract new developers, new improvements, and new modular subsystems; (2) accelerate the diffusion among new adopters; and (3) thus create increasing returns, thereby confirming the existing theory which sustains that orchestrators generate a new type of asymmetry (expanding the pie but keeping a bigger piece for their own hierarchical position). Finally, we confirm that dominant designs accelerate the

diffusion across heterogeneous adopters, as cases show, since innovation leads to opening up the possibility of co-operative relationships and generating externalities which can reinforce cumulative returns.

Multiasistencia, for example, created new businesses and new markets beyond the repair service industry, becoming a service factory and managing complex informational processes such as mortgages or transfers of customer information from one bank branch to another. As one manager described, "We have created a specific call centre for this with an application that handles more than 17,000 companies offering direct debit services."

6.4.- Co-creation

Commitments in these cases were initially established through strategic or idiosyncratic relationships searching for complementarities that could generate interest in co-investing in new software solutions. This situation then led to greater interaction and increased autonomy and the different networks developing new ways to carry out their business activities. Through co-creative activities, actors can perceive that they co-share ownership of the network as well as mutual adaptability, resulting in much better time to market.

Co-creation networks can be seen as ecosystems which engage in systemic innovation, while still providing the developmental tools needed to continue improving their set of functionalities. They can however be co-created through a set of derivative developments with greater agility, to meet market demands and better time-to-market, quality and integration targets, while avoiding disruptions and reducing risks.

The new business model developed by the IBM Barcelona Lab, for example, allowed for the creation of a new concept of software production known as "Hybrid Programming." As one manager stated, "The key issue for the Lab was managing a fast time-to-market". Unlike the strategic planning model in place up to then, this concept was based on the development teams who continuously co-operated with customers on "product drops" every few months. When a customer or the sales force asked for a new requirement, it was incorporated

into the software development program. These new requests were placed on a list governed by a cost-based priorities structure (resources, time and complexity) and by profit criteria (applicability and extendibility). One of the managers explained,

> "The versions depend on customer needs. Software development runs in parallel, coming out of the work of several teams responsible for each module. The new versions are launched at set intervals – every six months. We have also defined a new delivery process to ensure the quality of every product drop."

During this period, and due to the extensive experience and knowledge accumulated in integration projects, in 1998 the Barcelona Lab launched a new product: the Websphere Business Component Composer (WBCC) which is a line of pre-configured software tools using internet software. This greater flexibility permitted a new modular architecture to be defined based on "components" or small, functionality modules which provided specific solutions to the client's needs.

> "It allows software application designers to build quick and flexible banking solutions, re-use existing components and applications, and integrate them into their transactional systems. From the bank side, this is a way to protect their strategic investments in the mainframe."

This emphasises that: (1) autonomy, not coercion, is a critical variable to conducting innovation activities, and (2) adaptability at the organisational and technological levels serves to build core-competences at the network level such as the capacity to co-operate and learn.

6.5.- Digitally enabled commitments

Digital platforms set the rules of the game and network boundaries, as can be clearly seen in the Multiassistencia case. Multiasistencia built a Business Network Operating System (BNOS) to automate the process of managing its contacts with

corporate clients and the CCMS process. This system was deployed during the change process enacted from 2000 to 2003. The objectives of the platform were to: (1) determine a pre-defined pattern of behaviour; (2) ensure process control and continuity; (3) ensure scalability and provide the tools needed to manage peaks in demand and exceptions; (4) ensure information and communication flows; and (5) act as a deterrent to monitor the defined pattern of behaviour and Service Level Agreements.

According to one Multiasistencia manager,

> "We have substituted all human communication elements in the repair service, except for incoming calls, with machines. We have developed a Business Network Operating System that supports our sophisticated process, allowing people to manage exceptions to the main process"

It follows from Proposition 1 above that the use of ICTs has allowed the network to automate many processes and thus release limited resources. As one executive indicated,

> "Our model is that of making the whole process transparent. The integration of processes on the internet has allowed us to define a "virtual machine of finite states" with very precise expiry dates between states. The application has about 100 controlled steps linked to our client and professional applications. When an exception occurs, we must offer all the information available to the person directly responsible for its management to make the decision-making more effective."

This exploitative use of ICTs implies the use of structured information and problem resolution that can lead business intelligence systems to develop predictive models. As one manager of Multiasistenica recalled, "data is essential" because it provides more experience to people running the business and facilitates a learning process of day-to-day activities, all of which result in

internalising and mobilising knowledge. Similarly, as a result of having more information, Multiasistencia has developed experimental uses for its ICTs, allowing the firm to develop new solutions and services ("Factory of Processes") based on informational exploration.

Digital platforms contain programmed behaviour, including, for example, IT standards at different levels of connectivity and integrability: from data to processes and integrative behaviour. This allows a network information processes to be supported throughout the network and permits easy plug-and-play. Informational and technological limits can create entry barriers, but they also have lock-in effects or imply exit costs (see Shapiro & Varian, 1999). In the Multiasistencia case, the BNOS supported the new model to co-ordinate the network of trade professionals as the *framework for network behaviour and boundary management*. The BNOS is the basis of the partnership since the Internet portal is the *source of jobs*: (1) trade professionals are responsible for "pulling" jobs from the system; (2) the BNOS acts as a *deterrent* as it keeps track of Service Level Agreements (SLA); and (3) it monitors and supports the new information system. As one manager added,

> "For us the Internet does not just contribute value; it has also been the facilitator of the entire new operating model that we have developed. Everything is automated and we, the people, manage the exceptions; we manage the proactive quality. Simplifying the operating idea for Multiasistencia, the new process came about when we said: 'We're going to put it on the internet'."

Moreover, the BNOS reduced transactional costs due to the reduction in administrative tasks and paperwork arising from the calculation, invoicing and collection of payments from corporate clients and end customers (Multiasistencia executives estimated that, for some trade professionals (TPs), paperwork accounted for 50% of their activity, even though Multiasistencia invoiced on their behalf). As one trade professional added, "Multiasistencia has a self-invoicing

system which means that once you finish the job, you don't need to issue the invoice anymore."

The orchestrator exerts power through control of the digital platforms as a resource. In Table 6.1 a synthesis of findings at "focal firm" level and "individual level" (elaborated upon in chapter 7) is presented. It is important not underestimate the question of which actor owns the platform, and other issues such as intellectual property are also critical. In addition, the platform's capacity to increase the lock-in effect among actors in the network is worth bearing in mind. But above all else, the platform distributes the power to co-create, that is, the platform can be used as a tool for creativity, increasing collegiality and a sense of ownership while, at the same time, continuously evolving to provide new offerings and service innovation.

Governance Modes	Multiasistencia		IBM Barcelona Lab	
	Functions	Managerial Enablers	Functions	Managerial Enablers
Digitally enabled commitments	• Assignment of jobs to the appropriate trade professional • Automatic invoices • Online quotations for repairs • Claim management	• IT: (1) Digital Platform internet-based pervasive system connecting 100 corporate clients and 11,000 trade professionals; (2) Web Services to easily connect to the network and (3) dynamic boundary management	• Multi-channel Mid-Layer Software • Data conversion from mainframe to contact channels such as Contact Centre and the internet	• IT: Websphere Business Component Composer (WBCC) as a component-based platform for multi-channel integration
Co-Creation	• Proactive quality; lifecycle management • *Ad hoc* services and exception management (service improvements) • Customer-centric innovation for fast time-to-market: Participation architecture to enrich the DIGITAL PLATFORM as a network resource	• Active dialogue and conflict management • Key People in Key Projects • IT: Internet/Web Service Integration and Call Centre Integration with other partners	• Customer-centric innovation: incorporating customer requirements • Key People in Key Projects: rotating people and changing roles • LAN-DP and WBCC as component-based solutions founded on knowledge capitalisation	• Active dialogue to make sense of reality: "Application of technology to real problems" • Conflict management • Creativity – dialogue
Dominant Design and Market Creation	• Opening new geographical markets • Creation of SMEs for repairs "around the network" – spin-out-type program • Firm-driven innovation for new services • Defining new markets such as Healthcare and the Public Sector • Increasing scale and cost reduction for network externalities	• IT Flexibility: Factory of processes and system renewal • Knowledge generation to create new ideas • Exert autonomy	• Strategy: "Choose a series of key projects aligned with strategy" • Creation of the Lab in 1984 • Creation of new markets since 1994 • Creation of an SME to develop software solutions, spin-out-type program	• Information search and innovation screening • Active information exchange through formal and informal means • Exert autonomy

Table 6.1: The Three Modes of Commitment and Innovation

6.6.- A dynamic view of commitment

Figure 6.1 shows the three levels of commitment ranging from irreversible, co-creative, to "automatic" and their relationship with exploration and exploitation. Figure 6.2 below illustrates the commitment framework graphically, depicting the dynamic effects of commitments. Irreversible commitments (from point "B" to "C") lead to dominant designs and dominant business logic, as "node anchoring" and convergent behaviour, although the path is based on a set of experiments, a set of steps until the new business logic is right.

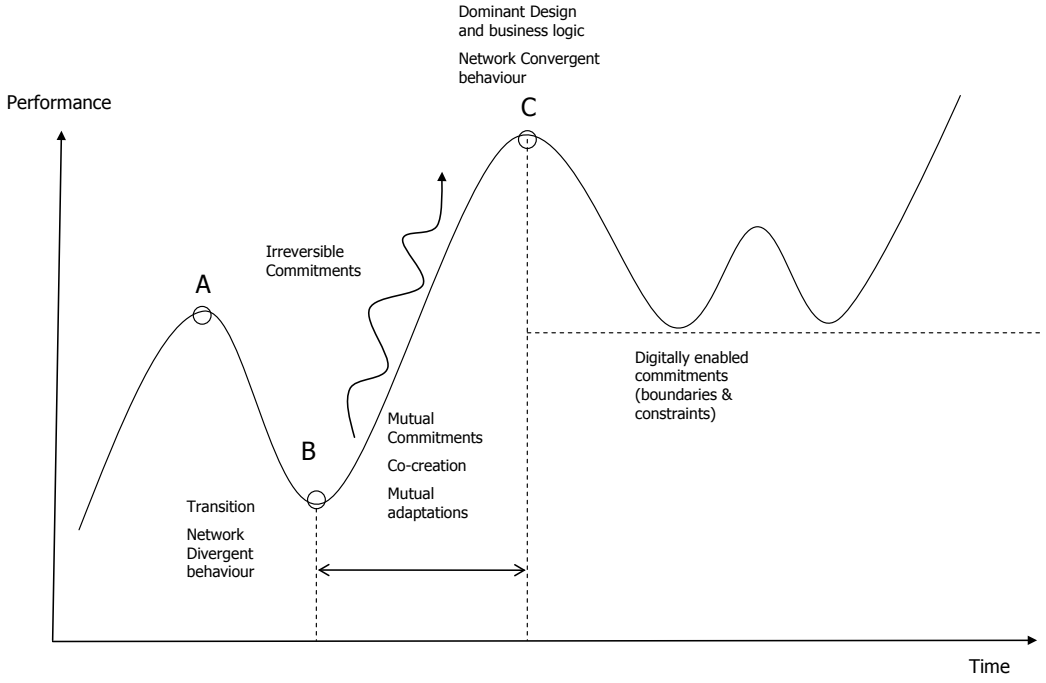


Figure 6.2: A Dynamic View of the Commitment Framework

This process is based on mutual commitments between network actors in order to develop co-creative activities. Similarly, this process may serve to attract actors who can incorporate new complementary factors into the network and into the digital platform due to increasing returns and externalities or super-positive sum games. Attraction can be due to opportunism, as discussed in Chapter 5, or even to natural euphoria at the beginning of any innovation process (Van de Ven et al., 2008). Here we argue for the importance of commitments as criteria for demarcation and boundary setting in orchestrated networks of innovation.

Running digital platforms can develop two roles. The first involves automatic boundary setting for network behaviour (as the Multiasistencia case shows).
In digitally enabled networks, some structural patterns or behaviour are driven by an information system that sets a specific set of constraints to limit degrees of freedom, precisely to establish a style (from the many which are theoretically possible) or, in business terms, a Service Level Agreement. The second role that information systems can play is that of a standard and standardisation platform for the development of new software modules for the specific function of front-office and back-office integration in banking systems. Although business functions are different, the social or structural function is similar, that is, setting boundaries for human activities and setting standards for behaviour. This is represented as a horizontal line that constrains the "levels of freedom" in our diagram of cycles, with the hypothesis that "ups" and "downs" can be held at this level, that is, setting boundaries of action.

Multiasistencia was entering new markets. This had two implications: geographical with entry into the UK and France, leveraging the scale and flexibility of its digital platform, and sectorial, the company's branching out into the healthcare and automotive repair industries. Furthermore, the firm also began orchestrating information from different local government agencies, providing a unique point of contact for citizens in different cities. Meanwhile, the IBM Barcelona Lab developed different innovative products to integrate a multi-channel offering. At the moment of writing this thesis, approximately 1,500 banks world-wide were using this company's solutions. Therefore, these two innovation projects which were the result of taking a different look at reality, in turn, led to the creation of a new market and a new business dominant logic.

After analysing upstream dynamics, we will now discuss downstream ones and sub-optimal regimes. Once a new dominant design emerges, the competition (both external and internal) that wants the dominant position will focus on price to take advantage of the new design's weaknesses. Competition will tend to offer the same product or service at better prices, with an emphasis on large-scale production (see Suarez, 2004). The main risks are technical community

disintegration and an increase in competition. Orchestrators focus on the design and deployment of specialised assets, that is, the generation of new modules through co-creative activities, focusing on more specialised assets which are more difficult to copy. This is clearly seen in the more mature phases within the IBM Barcelona Lab and Multiasistencia cases.

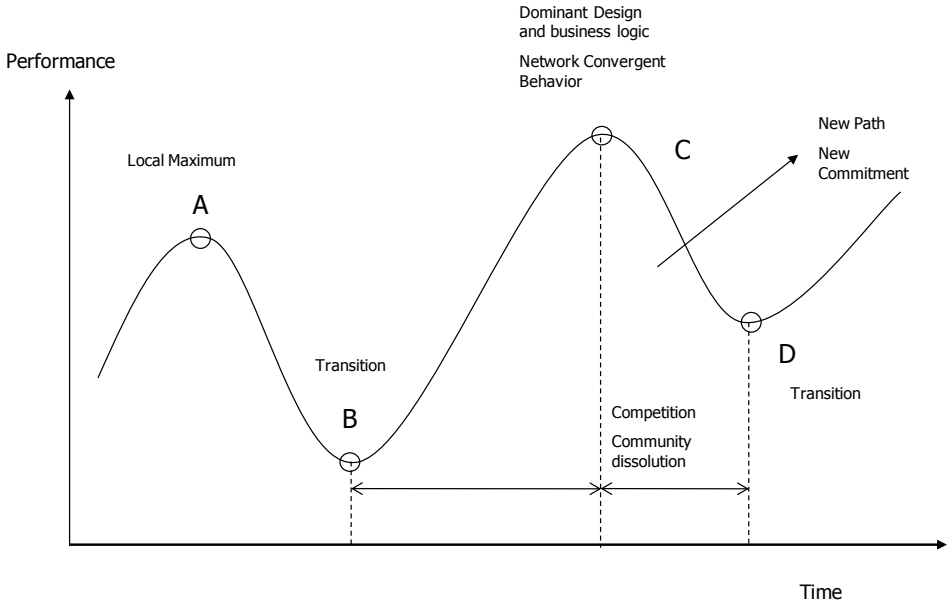


Figure 6.3: A Dynamic View of Orchestrating

Figure 6.3 is a continuation of the previous figure (6.2) but in which the risks and conflict associated with structural evolution during peaks (dominant designs) and troughs (sub-optimal regimes) are added. These are explored more in-depth in the next chapter.

In 2000, companies had the choice of subcontracting Multiasistencia or building their own infrastructures. From 2005, due to the appearance of four new firms providing similar services, banks could split their claim management and repair services between two or three firms. Perhaps this is why Multiasistencia's management decided to include some key trade professionals as internal employees along the way evolving towards a bureaucracy-like firm.

Multiasistencia's pioneering effort exerted a centripetal force not only on trade professionals and banks, but on other firms that saw this as an attempt to structure repair services which were previously unstructured and thus

inadvertently create barriers for new entrants to the market, competing in terms of price and scale. In 2009 the repair market was worth €2,500 M in which 20% was "free", that is, services were not controlled by major insurance companies. Multiasistencia controlled approximately 50% of this free market with a turnover of €250 M. The rest was distributed among 4 other major players. Since this service was driven by market rules and, due to the financial crisis that started in 2008, many small banking institutions started to sell this business unit to insurance companies, thereby challenging the market, since major insurers tended to in-source the service. Transaction Economics could have predicted this situation which, according to this research, occurred due to the absence of commitments serving as boundary criteria. If the criteria to mobilise resources are driven by price, then Transaction Cost Economics can predict that valuable resources will tend to be in-sourced by firms. The process of in-sourcing literally dries up the market and makes it a hostile place for newcomers.

In the case of the IBM Barcelona Lab, once the dominant design was released, the major risks it faced included the technological community's dissolution due to internal competition (a hypothesis) and internal policies promoting off-shoring. When a company depends on only one product, this can be a question of time since any software application, such as the first LAN-DP product or WBCC, will quickly enter a mature phase (4-5 years) where: "80% of the value perceived by customers was based on customisations," as one IBM executive related regarding their product.

The Websphere platform controlled approximately 20% of the system integration market in 2009, according to Gartner. One can suppose it controlled a much higher figure in the banking sector. This same source (see Norton, 2009) claimed that IBM could offer quick time-to-market and increased customer satisfaction for IBM's *agile Websphere implementation methodology*, based on 3-day workshops (see Figure 6.4). As this research shows, this is due to more than 25 years of proven experience, at least for the IBM Barcelona Lab, which is now a part of the multinational's global service operations and is, therefore, considered a local element in global innovation (see Nohria & Ghoshal, 1997).

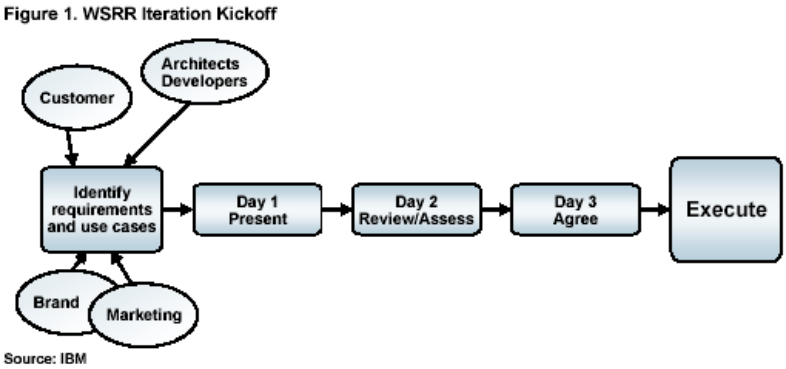


Figure 6.4: Agile Implementation of IBM's Websphere (Source: Norton, 2009)

This thesis has emphasised that centrifugal forces may have affected both cases: once the market is created, it follows its own rules, and firms tend to adapt to these rules following well-known principles. It is, of course, possible to start a new orchestrated path, as divergent behaviour, finding new opportunities, as is proposed in Figure 6.3 above, to avoid the tendency to create sub-optimal regimes and further cycles. This is, naturally, a hypothesis that will require further research.

6.7.- Propositions

From the theoretical framework presented in this chapter and the findings of the case studies, we formulate a set of propositions that emphasise the role of networks and information systems which link and qualify the different modes of commitment to guide future research in this area. This cross-case analysis serves to highlight two focal firms and their establishment of a strategic direction and determining paths to efficiency, revealing a capacity to co-ordinate actions and build digital platforms.

The IBM Barcelona Lab specifically co-ordinated a business network of software innovation for the banking and finance industries. Digital platform development was the main activity and task for the innovation network. Customisation was enabled through the interactive relationships established by the Lab and its customers to integrate new demands and enrich existing solutions and systems. This enabled the dynamic analysis of commodity-specialist input factors and the identification of optimal sourcing options. While for Multiasistencia, the main ethos underlying its business objectives was to satisfy customers' needs and requirements within the limits governed by SLAs and information systems, for the IBM Barcelona Lab, in contrast, bi-directional adaptation was performed through negotiations on project scope, terms, conditions, and deliveries.

6.7.1. Generative Networks

> ***Proposition 4****: Generative Networks are optimum configuration for self-renewal and dependent on the predominant symmetric relationship dynamics for co-creation.*

By 'generative' we refer to new sources of innovation and communication to engage in a multi-disciplinary and multi-connected network. Orchestration can new commitments as driven by the focal firm. This leads to new business development and new market development, co-creative activities and digitally enabled changes. Hence, it follows that increased levels of strategic choices and commitment lead to more radical levels of innovation through co-creation activities and a new dominant business.

Moreover, we can deduce that innovation is positively related to the firms' self-renewal abilities. In Multiasistencia, change took place by the company re-defining its commitments from a previously chaotic set of opportunistic relationships; in the IBM Lab, the latter simply had to open up to create relationships with its customers in order to co-create and leverage power inside IBM with this important resource. Mutual agreements, trust, and a business-to-business symmetric model were instituted. In some cases, the lasting existing

relationships were more prone to be dropped. At other times, they evolved to a new schema.

6.7.2.- Digital Platforms and Generative Networks

> ***Proposition 5****: Digital Platforms serve as proxies for commitments among network actors.*

Digital platforms are digital infrastructures to generate innovation. Trust may be impersonal, for example, with respect to the technology and the network itself (Shapiro, 1987). In the research presented in this paper, digital platforms played a critical role, serving as proxies for trust in the networks by providing transparency and being built as a result of shared investments and co-creative activities. Indeed, a digital platform is a space for information-sharing that allows for the transformation of the network's knowledge base. The digital platform plays a key role in network domains by: (1) exerting boundary control and surveillance, allowing the creation of network externalities and increased returns, network scale and lock-in and (2) expanding network domains of knowledge as a result of co-creative activities, continuous improvements and the generation of new markets. This underscores *the role played by technology* in fostering the dynamic interplay of capabilities. This interplay leads to proposals for the creation of new services through the assimilation of new knowledge and reworking the existing knowledge base in order to expand value options and increase returns. Multiasistencia focused on creating a new digital platform, its Business Network Operating System, allowing the focal firm to manage adaptation among participants, structuring and integrating information between nodes and links, and allowing firms to connect and disconnect. Furthermore, the new BNOS spread out along the network and helped to establish structured patterns of behaviour, institutionalising them and allowing free resources such as information to flow with higher levels of adaptability.

In addition, Multiasistencia wanted to increase the availability of information in real time, along with reliability, transparency, automatic tracking, control,

scheduling, and routing optimisation. The result of having more information was an increase in the level of control over the processes involved (not over employees through direct supervision). Another similarity is the establishment of more or less stable electronic links between network participants. The IBM Barcelona Lab, in contrast, managed a large network of personal contacts and relationships which gave rise to more of a process-like activity since they developed projects. Platform owners can benefit a great deal from innovation in complementary products and services added to the platform. They also benefit from the overall system: development costs drop as the scale of developers or contributors increases. Learning costs also decrease in co-productive innovation processes. Another issue is how to set criteria to provide the *right incentives* to the right participants. It is also important to understand which talented contributions are considered valuable and how they should be brought into the community, and how incentives change as the knowledge base changes (Pedersen & Larsen, 2006). This can be considered an important line of future research.

6.7.3.- The Role of Orchestrating in Factor / Market creation

> ***Proposition 6a****: Orchestrating Network Behaviour lead ICT-enabled networks to optimum states for innovation which engender the dynamics for market creation*
>
> ***Proposition 6b****: The Orchestration of (1) irreversible commitments, (2) co-creation and (3) digitally enabled changes has a positive impact on network business growth, self-renewal and market creation.*
>
> ***Proposition 6c:*** *Orchestrating enables explorative processes such as co-creative actions towards dominant designs.*

This thesis has proposed that Orchestrating can generate new markets, although this is a first step to which more research must be devoted. Markets can be seen as a new game, although not exactly driven by trust. In the first steps though,

when activities do not have enough scale, it seems that trust and commitments are essential to create communities. Once the super-additive games create a critical mass, the logic seems to be price driven and only competitive, thus drastically reducing the degrees of autonomy needed and dismissing the role in management in market/factor creation activities. Market logic tends to dissolve existing communities and increase competition and opportunism, thus reducing autonomy or, in other words, adding more constraints that can diminish the ability to innovate. Perhaps this is why there is no innovations market.

However, Orchestration can generate new commitments driven by the focal firm which can lead to new lines of business and new markets. Hence, it follows that increased levels of strategic choices and commitment lead to more radical levels of innovation through co-creative activities and the new dominant business. Moreover, it can be deduced that innovation is positively related to the ability to self-renew. This implies that there is choice regarding a new path. Management becomes an exercise in value generation by defining the limits of appropriate actions, commensurate with suitable expenditures of organisational resources. In other words, a criterion of successful management is knowing when to allocate limited resources to the more demanding long-term choices and commitments.

In both cases studied, significant inefficiencies were detected in business processes within the banking sector due to their profound knowledge on the industry's business and administrative processes. In this sense, they became specialised in complex, process-intensive information services, balancing greater scope and breadth versus greater focus and specialisation.

6.8.- Conclusions

Orchestrators exert power through commitments among autonomous parties, leading to the development and use of new digital platforms. In the two cases analysed, the focal firms managed co-creative activities and adaptation among participants, structured and integrated information among nodes and links, and allowed firms to establish compatible goals. The use of ICTs permitted the networks to: (1) automate many processes and/or (2) standardise activities, and

thus release free resources (or slack), as a result, balancing exploitative modes with increased interaction and information sharing.

As such, the new information system, spread out among the network, helped to establish structured and institutionalised patterns of behaviour that led to market creation through a dominant business logic and dominant digital platform design which attracted other actors, thus creating a critical mass which, in turn, led to a new market. While this is very clear in the Multiasistencia case, it is not so obvious in the IBM Barcelona Lab case. In the latter case, Orchestration was a temporary activity beyond the realm of the firm's traditional business activity, as was the creation of a banking system integration market and its agile implementation capacity (IBM has not disclosed corresponding figures on this matter). In addition, between the game played by the Lab and the market it created, there was another structure called IBM with its own policies, legal rules and boundaries, power structures and global strategies.

Now I turn to the individual level of analysis, that is, managerial capabilities, a theme developed in Chapter 7.

Chapter 7: Network Leadership

7.1.-Introduction

This chapter uses the normative approach, constituting a final reflection based on the empirical findings and adding a more personal view on the individual dimension of Orchestration and possibly even a novel approach to Network Leadership. The chapter discusses the full potential of leadership in terms of its proposed organisational capacities: the ability to organise, to set economic and performance objectives, and to hold the inherent conflict which any innovation implies at bay.

Thus far, we have discussed focal firms' power capacities to steer network behaviour for innovation by exerting a role as reference for the network, controlling boundaries, managing dynamics and transitions and incorporating digital platforms as structural resources. We have also examined network behaviour, the establishment of programmed or digitally enabled commitments, and the use of digital platforms as spaces for co-creation and a means to generate increasing returns to then create dominant designs and new markets.

Individual dimensions, however, are always complicated. Although this thesis is grounded on the notion of autonomy to understand networks as voluntary associations, we have also discussed the importance of commitments to set network boundaries for innovation. In terms of leadership, it is quite a challenge to contribute something, new due to the plethora of literature (academic, managerial and fictional) available on this topic.

This chapter is organised as follows. First, we explore conflict and then examine the way orchestrators manage relationships and power to set direction and performance, and to control this risk. Since the relationship between leaders and followers has already received attention in the literature (Kets de Vries, 1980; 2003; 2009), this chapter focuses more on inter-managerial and inter-leadership relationships, a relatively unexplored area in innovation studies.

To do so, first, we discuss managerial capacities at the individual level. After a reflection on strategic leadership, we briefly examine the essential traits observed as the result of empirical research. Second, we discuss authenticity which is a central notion to fix commitments and trust in relationships, the critical activity of a Network Leader. We then explore the following dimensions: (1) conflict management, (2) organisational capacity and (3) performance. Next follows a discussion of managerial capacities, and the idea of innovation as a conflict, analysing power and politics.

Lastly, we analyse how leaders engage in relationships with other leaders or managers. What the role of commitment between people is. What the relational dynamics between them are and how these influence the critical process of capturing value from innovation.

7.2.- Network Leadership

According to the empirical work carried out, the fundamental characteristic that defines leadership is the capacity to attract others through the ability to break the rules. This is a major force of attraction at the individual level, as confirmed by the literature (Kets de Vries, 2003; 2006; 2009). To that end, leaders have a very clear sense of the rhythm of the music of organising, since they can perceive early signals of change and choose the right moment in which to move. Although for many leaders, having followers is a factor of contingency and risk, this is why leaders may be alone and, on some occasions, isolated (Kets de Vries, 2006; Burns & Stalker, 1961). The major risks of isolation in business ventures are losing track of reality and incorrectly mobilising organisational resources. Defining a path for innovation is all about setting actions in response to real commitments.

This thesis stresses that Network Leadership comprises the ability to *govern* relationships, the complete opposite of isolation. Leading through commitments is emphasizing power and trust. This is achieved by Network Leaders defining boundaries (as sets of constraints), giving co-operative actions a sense of purpose and meaning. Leaders then exert autonomy by fomenting a process of

sense-making and experimentation in order to set a path towards innovation, facilitating peer-to-peer relationships for co-creation.

Leaders (and their teams) detect new waves or new technologies early on. The IBM Barcelona Lab can be seen as a good example. Its leader (and her team) detected that PCs represented a revolution for the banking industry. By the same token, the founder of Multiasistencia and his team created the repairs market (when, previously, the market comprised a highly fragmented set of activities). In both cases, Network Leadership obtained the full potential to understand relationships with other leaders (in banks, for example), with their teams, with providers and with managerial colleagues (new management in the Multiasistencia case). The critical capacity is to build teams, peer-to-peer associations, where everyone takes care of everyone else.

The difference between the two cases is that the leaders in Multiasistencia were able to create a new venture from scratch while the IBM Barcelona Lab is a story of how rules changed within an existing game through new commitments, fomenting innovation and structural change such as new roles, relationships and boundaries of action. The IBM case reveals how part of a commercial branch changed both its role and function by becoming a Lab, thus proposing a change in the rules, conflicting with the "existing game," namely, IBM and its structure.

7.2.1.- Innovation and Isolation

Isolation and Innovation are close phenomena. When new management decided "to place Multiasistencia on the internet", 80% of the Board of Directors was against the idea, seeing this new path as "temporary madness" and certain that the new management team wouldn't last very long. Similar things happened in the IBM case. When the Lab's staff communicated their plans to place PCs in bank branches, as one manager related:

> "People, even within the company, really thought we were crazy in the beginning."

As novelty comes about, innovators are considered as "outsiders", according to this researcher's observations. It is important to note that in Multiasistencia, the leaders of change were newcomers, but in the case of IBM, they were perceived to be outsiders or "crazy." Isolation is normally overlooked by the heroic interpretations found in recent approaches to innovation (see Teece, 2009). However, it is a classic argument that very thin boundaries are found between leaders: there may be heroes and scapegoats. Managers of innovation have to deal with tottering organizations affected by political conflicts (creating deep structures) and those associated with managing transitions and organisational loss (examined in more detail in section 7.4).

Depending on the individual, these situations in organisational life produce different degrees of pain. While an innovation does not produce trust, since it often represents a political change that may question future promotions and careers. And potential losses confront people with death (Bowlby, 1985). None of these are allies of trustful environments. Paradoxically, in contrast to what common wisdom may suggest, these are the main reasons why leaders do not tend to be surrounded by trust, making it very difficult for them to obtain commitments and, therefore, increasing the risk of isolation. In general terms, leadership does not presuppose commitments or trust at all, and on many occasions it is just the contrary (Kets de Vries & Engellau, 2004).

Isolation is a subjective concept since, for some, the degree of autonomy may fit into this category. Isolation means not having any trusting relationships within the social system or, in other words, with anyone else. Surprisingly, isolation is praised (possibly unconsciously) for innovative ventures in academic literature. These academic works tend to use the metaphor of a nursery that needs to isolate new-borns from viruses and bacteria. This ignores the basic notions of Psychology, such need for attachment and care, discussed above, as well as the need to be part of a social system (Bowlby, 1962). It also ignores classic managerial literature, such as Barnard's (1938/1968) *The Functions of the Executive*, which claims that "Human organisms *do not function* except in conjunction with other human organisms" (p.11), or Burns & Stalker's classic approach (1961) regarding managerial isolation which can be seen as an extreme of autonomy. In reality, this literature refers to the opposite meaning. Isolation

leads to extreme dependency on others. By contrast, the researcher has observed how network leaders strategically manage this contingent factor by carefully managing their own personal attributes (even a personal "brand") and relationships, as is also examined in the next sections.

Leaders may demonstrate emotional dependency or they may be "reactive" to the opinions of the group (and social trends), thus undermining productive leadership towards innovation. They may do this by compensating for the isolation of "ups" and "downs" by *over-* or *underplaying* their role (Burns & Stalker, 1961) and then taking too many risks, instead, developing, dramatic or "heroic" behaviour or bearing other's burdens, costs and opportunisms. We can see an example of this phenomenon in the Multiasistencia case (although we recognise some degree of speculation), when the focal firm was in its period of economic boom when it attracted providers by establishing opportunistic relationships and assuming all co-ordination costs (see Chapter 5). In contrast, underplaying their role may have meant not assuming the hierarchy (and asymmetry) associated with command, and thus promoting friendship, mobs and "circles" instead of professional engagement and commitment. This is more likely to happen during "down" periods. The leader may show empathy, but not friendship. These two attitudes are futile on the individual level. Since they project an image of falseness (Kets de Vries, 2003; Winnicott, 1971), they can worsen isolation (Burns & Stalker, 1961, p. 143) and may separate the leader from his/her area of work: eventually, in reality, worsening the "ups" and "downs".

7.2.2.- Empathy

This thesis has discussed the structural dynamics of "ups" and "downs." In social settings, these cycles can be easily associated with euphoria and loss; as we have argued, people sometimes find innovation painful. In these situations, isolation can be a defence mechanism (Argyris, 1990; 2004) avoiding pain though the use of informational filters, only hearing favourable comments while dismissing others (Burns & Stalker, 1961). *Innovation euphoria*, during the first moments of any innovative venture, can also be painful (ex-post). There are

many examples in economic life of resource misuse. The argument here is that orchestrators drive teams towards understanding these feelings, these emotional moods. Empathy is placing oneself in another's shoes, and it is important to regulate activities and dialogue. It is about people setting networks and linking current activities with future ones by setting a path of efficiency, meaning that they have to manage real people with real emotions that manage resources and real commitments while avoiding pain and isolation which can stem from the "ups" and "downs" mentioned. Therefore, this stream merits more research in innovation studies.

7.2.3.- Exerting Autonomy

Popular wisdom sees leaders as sources of inspiration and admiration (Kets de Vries, 2003; see also Mintzberg, 2002) that are needed in tough times. "We need leadership" people may say. To admire someone means having a favourable opinion of them based on approval, adoration and idealisation, all of which hide poor self-esteem by showing effusive respect to others; therefore, admiration is both a rationalisation and denial of the deadly passion of envy. The ones admiring choose an asymmetrical relationship with others (the objects of their admiration). This inevitably leads to evaluating one's performance by *comparing it to the admired person's.* The performance of the first will always be worse and lead to envy. One may argue that admiration is the surface of a deep structure grounded on envy. By exerting autonomy, orchestrators encourage testing one's own powers and performance, and they actively engage in co-creative and productive commitments with others. In this way, *orchestrators work at deep structural level*.

7.2.4.- Resilience

We argue that leadership is achieved through commitments. This starts at the individual level by committing to oneself: to be true to business or one's own interests, and to hold conflict and open up a new future. It is about binding oneself to the mast.

We also argue that this self-commitment could be called resilience. It consists of exerting self-control as the capacity to manage emotions. This can vary, however, from over-control to moderate control and under control, with the optimum being somewhere in the middle. Over-control means too much constraint and inhibits responses and communication (under-playing); it also reduces expressions and results in the incapacity to process information (Bowlby, 1980), finally, leading to brittleness. Under-control means dramatic behaviour (over-playing) and too few restrictions on information processing and communication (Bowlby, 1985). Resilience thus means modifying the level of self-control according to the circumstances, being resourceful and flexible to adapt to a changing situation, while possessing the ability to process competing, sometimes painful and conflicting, information.

7.2.5.- Authenticity

At the individual level of learning, generating trust and avoiding isolation can be synthesised into the first and foremost way of wheedling power: exerting power over oneself or committing to (or caring for) oneself. This is authenticity, which etymologically means *exert power over* and is directly connected to commitment with oneself and resilience. Authenticity is also related to assertiveness and the search for co-operative and co-creative formulas to solve conflicts.

According to the findings related to leadership in this research, this natural capacity must be complemented by managerial capacities such as: (1) organisational skills, (2) achieving economic or performance results, and (3) conflict management.

7.3.- Conflict Management

Innovation is conflict since it challenges the existing rules of the game. We have argued that power is about holding conflict. Leaders may demonstrate autonomy and exert autonomy over their teams, boosting creativity as the vital force for innovating. Innovation may generate conflicts due to objective mismatches, strategy and resource misalignments, operations and above all, power dynamics.

Here, the focus is on orchestrators and examining their capacity to establish commitments to hold conflict (see Chapter 2). This is related to the idea that pre-commitments are strongly associated with exerting power over visceral human passions, such as fear, envy, pain and hostility. These can worsen during periods of change and innovation due to the changes in political systems and the inherent loss that any innovation represents, which can lead to the misuse of resources.

7.3.1.- Role and Relational Conflicts: Re-thinking Centrality

As has always been the case, new ideas conflict with human interests at empowered and political levels. This is Machiavelli's classic argument: leading change is hostilely received by those who are taking advantage of the existing order, and may even be exploiting current asymmetries which are repressed or hidden by coercion or arbitrary measures. As one Multiasistencia manager claimed,

> "Innovations are good for the organisation, but they can be bad for many people. By proposing changes in processes, products or ways of doing things, you are unintentionally questioning their work."

The notion that innovation is "good" for organisations and "bad" for people leads to the natural conclusion that, at best, innovation will obtain mild support from those who may obtain some benefit from the changes the innovation produces in the future. Not all leaders promote change, and there will always be other leaders to represent people that do not want a change to the status quo. In both cases, the leaders are transgressors, since they do not follow existing rules or commitments. Chapter 2 has argued that the orchestrator can be associated with the role of the entrepreneur who breaks the rules of the game and proposes a new rule. In Multiasistencia, new management played this role in 2000. The role of the critic, in opposition to the conservative one, was essentially played by the

company President's and COO's[3] former "right–hand man." According to one Multiasistencia manager,

> "When we joined the firm, there were bets about how long [we] were going to survive in that context. Our predecessors lasted a few months. In our case, the founder took a step back, becoming President, and gave us full support to conduct the change needed."

By stepping back, the President adopted an institutional role to try to settle disputes. Through this research, we have also found mentor roles in major banks and among key trade professionals who, by agreeing to co-create a new venture, supported the process of innovation and also sponsored it by committing to this new business and risking financial resources to advocate and support Multiasistencia's BNOS initiative. In the IBM Barcelona Lab, three roles were played within the focal firm, those of: (1) the champion (or advocate), (2) the business development manager who linked software production to different IBM units and customers, and (3) the architect who ensured software quality production. In Multiasistencia, the roles of architect and business developer were quite similar, as was the role of champion. This therefore, confirms the roles proposed by Hinterhuber (2002). In both cases, the focal firm generated new business (playing the role of nurturer as well) but also served as a reference for the owner of the technology, expanding the pie and acquiring a bigger slice (as suggested by Dhanaraj and Pharke, 2006).

The argument here is that role conflict needs political mastery, i.e. knowing how to manage relationships, since different leaders have different approaches or priorities to determine the path to efficiency, and they may feel endangered due to their current status. If we are asked to form a network, we will normally place ourselves at the centre. Our relationships would be our set of choices (but also the choices others may have made concerning us). As such, we have considered the IBM Barcelona Lab as the "centre" of orchestration, comparing it to the Multiasistencia case. The main difference is that while Multiasistencia started from scratch, building a network and selecting the relationships to structure its

[3] Chief Operations Officer (COO)

business, innovation at IBM (as in many other firms) came about with existing dependencies, structures and relationships. Multiasistencia is a metaphor for the evolution of deep structures compared to IBM, which can be considered an example of deep structural change within the global, formalised IBM structure.

Having examined the results, we now take a different perspective, attempting to observe this Orchestration from the perspective of IBM headquarters (HQ), as depicted in Figure 7.1 below. The Lab does not have to be placed at the centre, according to one manager, "in a country - that is, Spain - in a corner of the world - that is, Barcelona.

This perspective enables us to better examine how the Lab (and other similar initiatives) can be considered to have exhibited deviant behaviour or an act of defiance to formal HQ authority. In this situation, the HQ is challenged to regulate the appropriate level of autonomy to ensure cohesion and coherence for its strategies and structures. However, this process can also be seen as a natural way to express new ideas, a desired path, as in formally landscaped gardens where people tend to choose natural paths over the pre-designed ones. The IBM Barcelona Lab case shows that focal firms and innovation can happen anywhere, despite existing rules of the game and structures.

As already argued, Orchestration has an antecedent in innovation dynamics within differentiated networks (Nhoria & Ghoshal, 1997). On the surface level, this organisational phenomena is called "local for global", this can be seen in the Barcelona Lab case, since an initially local innovation came to prominence in the global market of the banking industry and was adopted by Corporate IBM, first as a set of products and then as a practice. In this and similar cases, local leadership may have to confront global leaders for the resources required (Barlett & Ghoshal, 2002; 1990), thus presenting a conflict between the role that local managers would like to play, HQ's pre-defined role and structure, and personal subjectivity with regards to this conflict of roles. The literature emphasises that, in order to be successful, local innovations require a local critical mass, and fluid communication between the local subsidiary and HQ.

Yet how does Orchestration exert power through commitments? The obvious observation is that commitment is a two-way street and hierarchical superiors who are willing (and able) to assume these commitments are essential. Commitments require peer-to–peer relationships, yet HQ controls scarce and unique resources, such as career paths, promotions, salary policy, rewards and punishment.

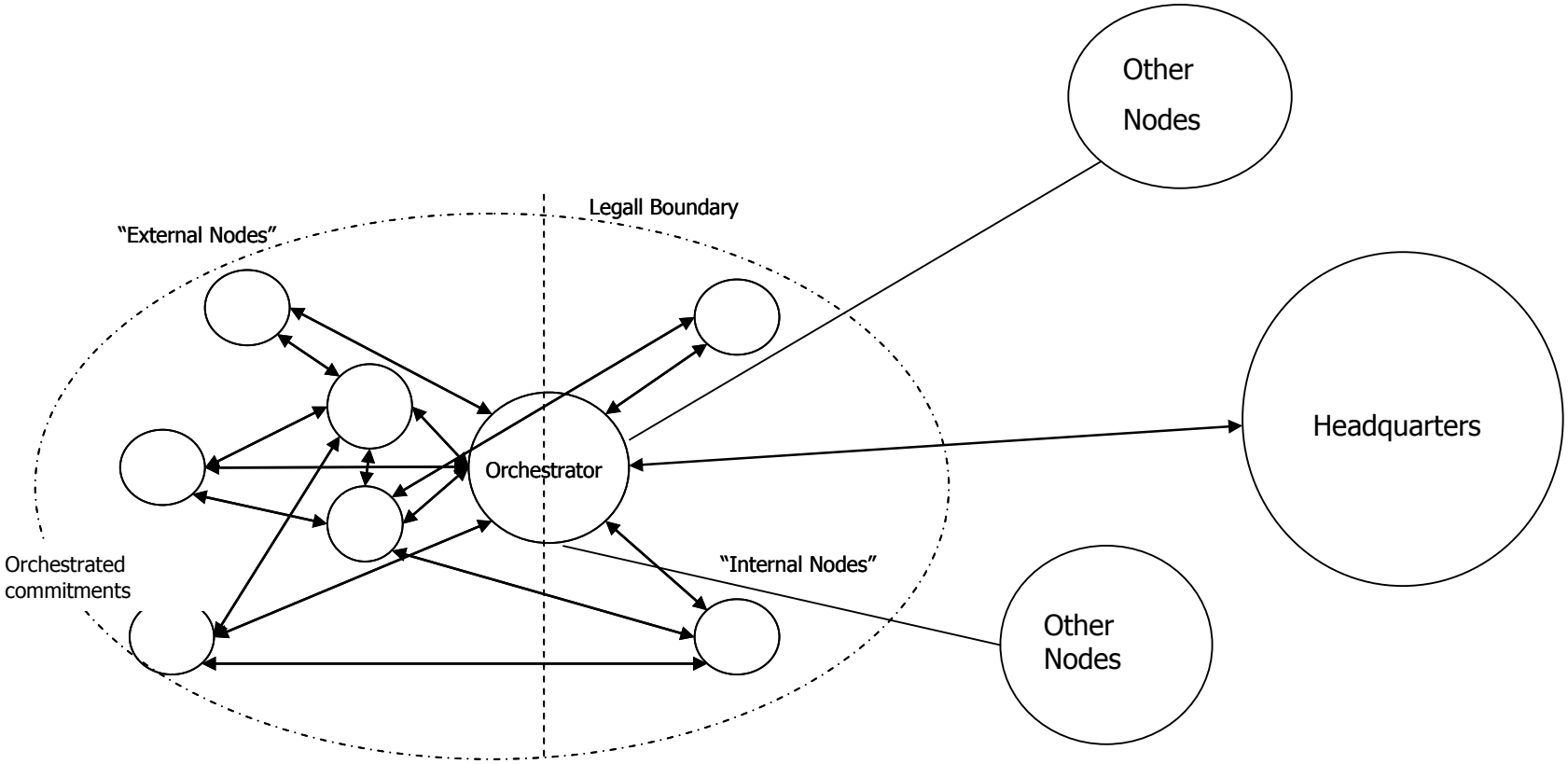


Figure 7.1: Orchestrating as re-thinking centrality

7.3.2.- Political Mastery

In some firms, the role conflict associated with innovation is not managed through commitments. Arbitrary measures involving coercion are well-known power games found in *divide et impera* and/or *tertius gaudens* tactics (see Burt, 1992; Álvarez & Svejenova, 2005). By *tertius gaudens*, we refer to the fact that HQ can play the "tertius" role as the institutional guarantor of the structure - while instigating conflict (or letting it continue) between innovators and innovation critics. This means taking opportunistic advantage of the normal conflict any innovation implies. Orchestrating activities can be targeted by applying simple *divide et impera* strategies taking advantage of any conflict arising by dealing with different members asymmetrically and applying arbitrary methods to create mobs or "inner circles" to isolate other groups. This may be the reason why some scholars argue that innovation must be initiated at the top of the hierarchy (Hamel, 2007), placing the responsibility for change firmly at the institutional level.

In addition, innovation outcome, as well as the resulting team performance, has its cycles. It is easy to wait for decline in the absence of the level of investment which would have ensured long-term viability. It is worth pointing out here that while some new ventures may be aligned at a given moment in time, others may not be. For example, this could have been the case of the IBM Barcelona Lab if it had clashed with the US Lab responsible for the company's IT infrastructure for the banking industry.

We have seen that IBM allowed autonomy for innovation, giving space to IBM Barcelona Lab to take advantage of the new dynamics associated with the PC and internet developments. Moreover, at the strategic level the Lab wittingly developed: (1) important relationships with banks that counter-balanced internal competition; (2) a strategy of carefully feeding internal relationships to avoid the perception as "outsiders." In this way, the Lab gained the support of the Spanish banking system, as well as the "internal" IBM sales division which saw the Lab as a strategic resource to better control customer behaviour, and then through the

installed base it acquired a better position for new business; and (3) ways of taking advantage of the revolutions represented by PCs and the internet in a new era where technology was no longer going "to be invented only by IBM," as some IBM employees related.

This leads us to emphasize the need for "political" skills, since different leaders consider different approaches or priorities to determine the path to efficiency, but all leaders need to know how to best position themselves to manage these differences. Relationships in global formalized firms are asymmetric and hierarchical. This approach leads to evident and implicit conflict between the various visions, objectives and resources thought to be needed to capitalise on innovation. The question here is how leaders in global firms can make commitments with innovators or, in contrast, why they disregard innovators, leaving them alone facing conflict with critics and product cycles. Administrative Theory pays special attention to opportunism, assuming that managers need to control subordinates. However, it is quite silent on opportunism concerning relationships among leaders. Opportunism - as opposed to commitment (regardless of where it comes from, as argued in Chapter 5) - is incompatible with innovation.

Managerial opportunism normally incorporates arbitrary measures in the selection of managers, or in making them scapegoats out of people to cope with demands that cannot be fulfilled due constraints within organisations, product lifecycles, etc.), which may eventually justify their removal of management (Pfeffer & Salancik, 1978). Since managerial performance and accountability are subject to discretionary assessment, this author's reflection is that the innovation manager should address how innovation is going to be assessed upfront and agree on how accountability is going to be monitored from day one. In the cases studied we have seen that it is difficult to account for results in innovation, a look at how this can be done is an important issue that merits further research.

Nevertheless, in the context of the cases studied, we have observed how management at the institutional level focused on the coherence of the firm to ensure the success of their innovations. This is why IBM Barcelona Lab searched

for active engagement and co-operation not only from banks (external firms in terms of legal boundaries), but also from the other Labs in the company, since "they did not want to substitute existing IT investments; they wanted to complement and protect IT assets," as one manager noted. Moreover, the IBM Barcelona Lab pioneered a new business solution, leveraging software development that was highly aligned with IBM's new strategy. According to our research, this new venture was culturally acceptable for the organisation, not only in terms of content, but also in terms of how it was driven. The IBM Barcelona Lab rapidly engaged in co-operative action with other parts of IBM: other IBM Labs, sales departments, consultancy units and other internal divisions. The issue they faced here was how to combine hierarchy and priorities with power distribution, something they achieved by establishing clear references, accountability mechanisms and rules of the game.

7.3.3.- Managing Transitions: linking the old and the new

In any change process there is organisational loss. This concept has been nicknamed as a "chasm" in managerial and academic literature. We prefer to call things by their real name, since imprecision as regards concept names, often leads to imprecision in terms of the concepts themselves. The IBM Barcelona Lab case is a good example of organisational loss: (1) in 1994, it lost its product and was forced to transfer it to the UK; and (2) the Lab's staff was reduced from 70 people in 1994 to approximately 15 in 1997. It was an important loss of community, as shown in the following figure on Lab staffing (see data for 1995-1999).

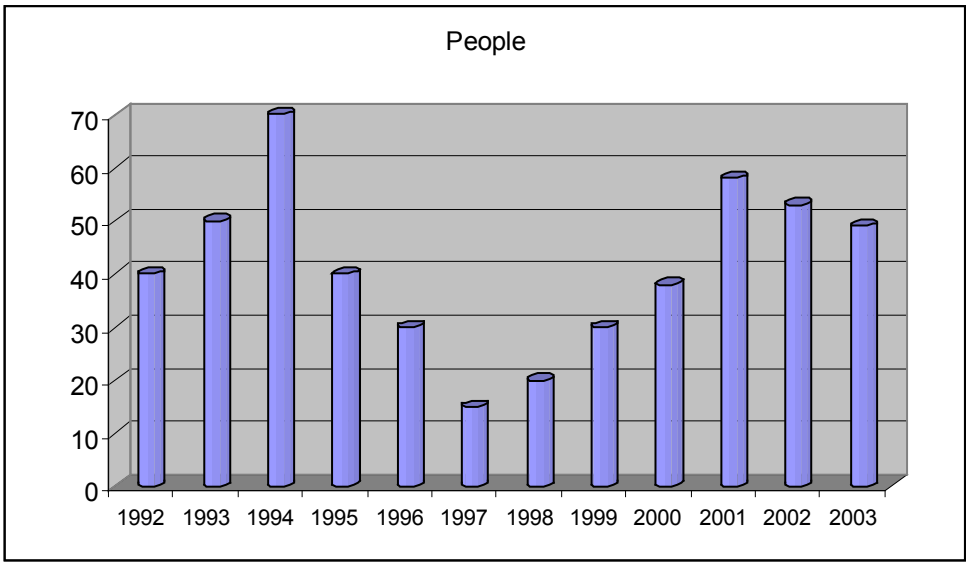


Figure 7.2: Change in Number of IBM Barcelona Lab Staff

This is how the Lab Director appointed in 1994 remembered this situation:

> "In 1994 IBM was restructured as a result of the crisis that had affected the company. So the company decided to consolidate all our small laboratory developments – when we say small, a laboratory with less than a hundred people was considered small – and to merge them into larger laboratories. In our case this meant Hursley in the UK. So in 1994 we were told we were moving. At the beginning, the reaction, the human reaction, was "why?" Everyone was trying to work out the macroeconomic reasons that might have led IBM to take the decision, thinking about their economic situation, their corporate strategic position, etc., people wanted to understand these reasons and to share and communicate them appropriately. IN the end, we had to transfer all our lab's existing knowledge as professionally and appropriately as we could.
>
> You treat the product like one of your children, don't you? There's a series of almost personal and emotional bonds. In the beginning (and I'm not going to try to kid you on this) the reaction of some people in the beginning was to say: "Right, but why? What's the reason for

this? And, who are going to be the product's new parents and now what's going to happen with the laboratory?"

Left alone, with no clear support to cling onto and no hand-holding, a transition can be considered seen as a lack of commitment by the people who stand to lose the product or the activity. As discussed, the processes of disinvestment (or lock-out) looks very different if we consider it from the HQ's perspective and commitment is also required to proceed with lock-outs due to its irreversible nature. The Lab had the space it needed to understand the loss of the product, but it also had the capacity to re-invent itself with another type of activity.

As mentioned previously, the same year that Multiasistencia started its transformation (2000), its COO and CIO (who had held the positions since 1989) left the company with a small group of followers to create a new company to compete directly against Multiasistencia. They not only took knowledge with them but also a "copy" of the software developed at Multiasistencia to start up their new venture and run its operations. Multiasistencia sued directors and the new firm, but, after several years, the courts were still unable to determine whether the software could be considered as having been stolen, since defining the intellectual property rights for this kind of intangible asset was very difficult according to the management interviewed. Nevertheless, Multiasistencia's management soon realised that this painful situation had essentially only served to further drain the firm's resources and energy while also constituting a major distraction.

"Multiasistencia's top management decided to focus on the firm's core business and reinforce its relationships with customers and trade professionals. In short, they decided to put Multiasistencia's business back on track and leave the litigation to the lawyers, not considering it a top priority," according to one manager.

As we have seen, other firms entered this newly created market, increasing competition. In of our both cases, management set a path and stuck to a commitment to confront feelings of loss and the associated potential conflict. One IBM Lab manager synthesised this situation as follows,

> "After losing the product, we asked: What's the next step? Or, where are we headed? What are we going to do? And then they suddenly hand you a blank piece of paper, freedom to think and freedom to design your own future".

From this short description of the situation we can identify the well-known natural phases of loss (see Bowlby, 1985), starting with denial, moving to anger (people leaving, some with products with which to form competition), through to negotiation and acceptance (explaining why a product is going to be transferred or why Multiasistencia should take advantage of the internet) and finally to the creative design of a new future.

In this kind of situation being in the game is more costly than rewarding. From what we have observed, the design of a new future starts by engaging creativity, confirming existing theories (Kets de Vries, 2009) and opening spaces for communication and sharing, as well as letting people elaborate on this process. As one IBM Barcelona Lab employee recognised,

> "To be able to think as a team; to be able to tackle the situation and say: "OK, *now we are masters of our own destiny and we can focus on where we think we can contribute most as a team."*

Innovation literature recognises the important psychological investments that people deploy. Here it is vital, as observed in the IBM and Multiasistencia cases, that management is successfully chooses to commit to a new path, re-designing boundaries or actions, and not (as can often be the case) responding hostilely, creating potentially negative relationships. As we have argued, commitment is established to ensure autonomy, not create a slave of visceral passions, which, as we have seen, are a part of business life. Finally, we would like to emphasize the importance of developing an integrative leadership role, that is, the capacity to link the old and the new, and to bring everyone to a new future.

7.4.- Organisational Capability for Co-Creation

We have argued that leadership expresses its power through its capacity to attract and influence others (as a centripetal force) and to spread ideas, thus dynamically expanding boundaries. We have also shown how innovation is a source of conflict and how this conflict can lead to a great risk of isolation for leaders. We turn now to an examination of how to set commitments as the organisational capacity to set boundaries, focussing on: (1) communication skills; (2) managing strategic relationships; (3) managing mutual adaptations; (4) multi-disciplinary teams and (5) recognition.

7.4.1. Communication

Communication is the way in which solutions which can contain conflict are co-created. Indeed, the good thing about conflict is that it revolves around existing asymmetries and gives the leader a chance to solve them. Power is needed to change the rules and set new boundaries. A classic argument is that authenticity, empathy and assertiveness are essential to deal with this conflict. These traits help us to understand others' points of view, without necessarily sharing them. As one Multiasistencia manager indicated,

> "The communication policy of sharing our objectives with them (Stakeholders) was an absolutely key factor, since there was a relationship of sharing the objectives and of *growing together.*"

Or, as indicated by one of the members of Multiasistencia's professional network, "We learned to share information and work in a more transparent way." Transparency engenders trust. This highlights the importance of monitoring, selecting sources of information and commitment. As one IBM Barcelona Lab manager reported,

> "I brought in a totally open laboratory layout, so there were *no "boxes", to* encourage creativity. There were no offices. And why? Because I was extremely concerned about encouraging dialogue,

> creating a challenge between people, forcing them to talk to each other."

Dialogue is the major tool for leading team and organisational learning. Dialogue is a free flowing conversation between people, allowing them to discover insights that they could not attain individually (Bohm, 1965). As one IBM Barcelona Lab manager commented,

> "Dialogue is a key part of our Mediterranean culture, but it was an intellectual discussion, where my solution did not necessarily have to be the best one. When my solution was presented to collaborators as a whole, the team members, discussed it to death, reviewed it and substantially improved it."

According to Bohm (1965), "Dialogue is a special kind of collaborative conversation, quite distinct from discussion, which is primarily competitive." Regular meetings are good settings to use this technique because: (1) they serve as a source for group decision-making and turn debates into intellectual efforts, not personal confrontations; (2) they represent an exploratory activity, to discover insights which are not within the reach of the workers individually; (3) they are a public instrument by which to recognise contributions (asking somebody to prepare a presentation, for example), while also representing a powerful tool to encourage, influence and reward people; and (4) they allow us to understand people's behaviour and interpersonal relationships.

Above all, these meetings give the message that people are not alone during the turbulent times brought about by innovations. They allow the appropriate level of conflict and different perspectives to be attained, and avoid social processes such as conformity or "groupthink" which can lead to reality avoidance. Trying to establish unilateral control over situations hinders any attempt to, first, find out about conflicts and, second, to try to resolve them through the use of dialogue, since potential conflicts are kept hidden (Argyris 1986; 1990; 1994; Argyris & Schön, 1996). Instead of searching for the roots of discrepancies, wheedling of unilateral control may lead organisations to enter into latent conflict and

encourage the empowerment of leaders who have a tendency to confront and cause conflicts. Gaps, conflicts, and contradictions are living things, and conflict will not simply go away if we try to sweep it under the carpet.

7.4.2. Managing Strategic Relationships

Managing relational dynamics means knowing how to manage the relational lifecycle of co-creation. It implies knowing how to start relationships, how to manage them to ensure equity and peer-to-peer dynamics, and how to terminate them (or leave them in a latent state). It means that priorities are based on strategic relationships (not only arms-length ones), including: (1) realistic issues and realistic commitments; (2) focusing on projects aligned with a defined strategy (for example, as with the IBM Barcelona Lab and IBM as Corporation); (3) searching for complementarities, that is, where an exchange of knowledge and complementary resources might be; and (4) both parties engaging in real commitments on economic and legal levels. The IBM Barcelona Lab Director described what relationship management was about in the following way:

> "You really are successful when you apply talent, technology and know-how to *real problems*. And, as our background and our 'baggage' was in banking, we set ourselves a challenge: getting on borad the banks *that were more in line with the strategy* that we wanted to follow as IBM and as a team within IBM.
>
> We were also looking for a leitmotiv, a strategy that could attract talent and hold on to that talent. We had and attract *talent from outside as well as talent from inside* the company. To do that, you need to believe in what you're doing: it's necessary to have a passion for what you're working on.
>
> The first initiative that we started up was to choose a series of key projects where we knew that the clients wanted to innovate; where we knew that there were innovation niches waiting for us to come up with a solution for; and where we could put key people from the laboratory team in those clients, with a marked leadership task: to

capture each of the clients' existing innovation and turn it into reality."

This approach defines network behaviour, a style or a "leitmotiv." It is like a piece of music that sets the rhythm, a pace which, paraphrasing White (2008), is a style that defines an identity and which leads to a hierarchy and a way to attract others.

Another important aspect is the emphasis on emergent associations of autonomous actors from inside and outside (the boundaries here being the legal ones), in order to create increasing returns based on the management of relationships. The IBM Barcelona Lab and Multiasistencia developed these projects based on networked associations to engage in co-creative activities with their corporate clients. In the Multiasistencia case, the management forged trust by being transparent and not hiding the problems the company had in 2000. For example, Multiasistencia worked with a major European bank to define a new application to inform end customers in real time every time they called the bank with a claim. The project was developed in collaboration between the two companies during 2006 and was put into production at the end of that year. One executive from this bank declared, "We have to add transparency to our service. Information is the key to increased loyalty."

Finally, relationships end, and this has to be managed as a loss, as previously discussed. Reasons for ending a relationship may be that results do not meet the others' expectations or that one or more of the agents in the relationship decides that the expected objectives will never be achieved. Multiasistencia, for example, lost some customers during its change process from 2000 to 2003. For some, this "break-up" lasted two years, since the IT and process lock-in were extremely significant, and complete disconnection was required. In other cases, the relationship ended because the costs of maintaining it were greater than its benefits, or because the relationship was not successful. In many cases, relationships end simply because the project and its purpose end. As seen in the IBM Barcelona Lab case, if the relationship has been beneficial, it may be kept latent, making it very easy to restart again in the future. In fact, many of the

Lab's competencies were knowledge-based and could be found in latent relationships with satisfied customers.

7.4.3. Mutual Adaptation for Co-creation

We have argued that networks, as loosely-coupled structures, are optimal configurations for innovation since they are formed by autonomous actors that can commit and adapt dynamically to each other to keep the structure alive, evolving and organising for the future. This is a different perspective from the so-called *Conversion Theory* described in Chapter 3. The term "conversion" assumes that a conflict is solved by accepting a new idea. This may be true in some diffusion mechanisms. However, with co-creation, we propose that adoption is an active process of co-construction which, at the same time, is a process of diffusion embracing two types of adaptations: (1) technical adaptations in product features or the production process; and (2) mutual adaptations that bind companies together, often in a direct physical sense, reflecting a mutual commitment which, at the same, is limited in time and empowers the companies.

In the IBM case we stress how management took care of its people and its installed base in order to connect the new technologies (and organisations) with future ones. As one manager justified:

> "We weren't trying to do away with anybody's job. Instead, we wanted to use and maximize all the existing technology: In other words, everything that would become the mainframe. And what we did was to take advantage of personal computers and hook them up to the best communication mechanisms that existed at that time, and which still exist in our clients' applications to this day."

During projects, activities were focused to have a more complete vision of the interaction. This "bi-directional adaptation" - as several managers alluded to in both cases - respects cultural and market diversity and differences, and also respects the diverse business requirements that depend on different market conditions and customer needs. This recognises pluralism; in other words, power is distributed in networks. IBM Lab staff not only sub-contracted work with

Independent Software Vendors (ISVs), but also "hired" project directors from the banks to work in the Lab. One manager added that IBM top management was reluctant, "But how we are going to have people - clients - in our innovation and development centres?" And, without a doubt, that has been one of the wagers that have given the best results".

Multiasistencia staff was also rotating permanently with major banks, and developing strong relationships with top management, becoming a critical factor to support the development of the Business Network Operating System (BNOS), as well other co-creative ventures.

Moreover, IBM Lab staff sub-contracted work with ISVs to manage network capacity, depending on the work load. Since orchestrators lead formal and informal relationships, including people "outside" the organisations' legal boundaries, orchestrators normally command "external" and critical resources for their legally defined firms such as key relationships with key customers and key associations, thus leveraging power with the control over these resources.

This emergent type of organising is based on co-creative relationships that are based on exerting autonomy. In the IBM case, management asked the employees to change roles and rotate positions to avoid them feeling too accommodated and to ensure their continued search for new opportunities, a process which empower people.

One of the Lab members stated,

> "This results in plans being changed. People have to be dynamic, flexible, and know how to adapt to these changes. I would say that this is a little difficult at first; basically, professionals prefer to know very clearly what is expected of them, exactly when and how. And as soon as they get used to that dynamism, to that flexibility, they take it as a routine part of their work."

By the same token, in the Multiasistencia case, Customer Service Representatives (CSRs) were asked to change their role from "information searchers" to "process owners", to control processes proactively and interact with different actors in a learning process to manage exceptions. Key Account managers searched for more commercial opportunities by developing a better understanding of bank processes. Trade professionals were encouraged to become small businessmen, more autonomous and committed to Multiaisstencia. And IT staff members were engaged in co-creative software projects with banks. This is similar to the IBM Barcelona Lab case where staff changed from project management to system analysis and business consultancy positions.

The capacity to rotate from software development to project management and to even business development was considered a part of the Lab's tasks, thus "avoiding repetitive or routine activities," according to one manager. Leadership, according to the Lab Director, was:

> "A matter of capturing the existing innovation needs in each of the clients, to turn this into reality and co-create a solution with them. As a result, we had key people in key projects."

Experimenting introduces a flow of ongoing ideas and inventions, a combination of accents and changing harmonic patterns that interweave the structure of relationships and networks. In all cases, problem-solving requires: the tacit accumulation of experience, "actionable knowledge," the use of explicit knowledge, interaction with other people, information systems, and creativity which leads to performance. For the IBM Lab, their hybrid programming technique allowed them to produce software releases and reduce the time-to-market to only 6 months. As one manager pointed out,

> "What we wanted was for the client to be involved in the whole development processes, from the beginning right through to the end. This approach requires trust and transparency since you can't hide any mistakes, but the result is very beneficial since we are all in the same boat."

IBM Barcelona Lab engaged in many formal and informal relationships with other IBM Labs as well, reaching commitments with "internal" units. As one Lab member related,

> "We had the experience to support multi-platform and operating systems. In 1992, three months before an IBM laboratory in the USA launched the new version of a new operating system, they discovered that it needed 15 or 20 more diskettes than planned to hold the entire operating system. This would have caused project costs to soar and delayed the launch of the new version that was to adapt production to the new conditions. During an informal conversation, one engineer at the Barcelona Lab offered his colleague in the US a compression algorithm he had been working on in his free time. A few days later, initial trials on the algorithm were successfully held. Until 2002, this solution remained IBM's standard software compression algorithm."

7.4.4.- Multi-disciplinary Teams

An interesting finding is group identification beyond legal boundaries in processes of co-creation. One of the IBM managers commented, "As a final result, we have clients who consider themselves *one of us*." This suggests that trust among team members considers peers to be "equals" in terms of hierarchy, even reaching "members" beyond formal legal boundaries, something which represents an advantage, but also raises many questions in terms of co-creating products and services. For example, who owns the intellectual property rights? If a company can use technology to link or increase lock-in of network actors, could it, for example, also include better ideas for new service development? Is this a process that better fits strategies and resources and their transformation within all the network actors? This discussion underscores the importance of managing secrecy, non-disclosure agreements and incentives and their evolution in co-creation efforts, and how they are different for each player in the network. These questions could be the subject of further lines of research.

7.4.5.- Recognition

Recognition is the cornerstone of any leadership process (Anderson, 1983). And innovation, as seen, questions people's previous achievements. Co-creation recognises actors in the network as creators, thus making recognition a cornerstone of network leadership abilities, allowing the leader to attract more talented people, more projects (business), and more actors, reinforcing the orchestrator's centrality as a reference for innovation.

Managerial recognition of others' contributions is a *sine qua non* condition. We stress here that co-creative networks do not only rely on managerial recognition, but also on empowering people, based on the idea that giving autonomy allows them to develop, as well as to learn to work with a view to achieving one's own as free individuals (Rand, 1967). Exerting autonomy confronts the risks of immature organisations in which its members are prone to identify managers as the only ones who exert power (Kets de Vries, 2003). In contrast, pluralist organisations distribute power in a similar way to democratic political regimes. The issue here is the successful combination hierarchy and priorities with power distribution: with clear references, accountability and rules of the game. As one top manager in the IBM Barcelona Lab added, "Being part of the Lab gave people a *sense of pride* and recognition." This same sense of pride is observed among the trade professionals who work with Multiasistencia, "Being part of the Multiasistencia network is a way to express our quality," as one trade professional commented.

Formal managerial recognition must also be applied. For example in the IBM Barcelona Lab case, the engineer who developed the compression algorithm became a member of the IBM Academy, enjoying great prestige and recognition. Similarly, the President of Multiasistencia explained the company's key success factors as follows:

> "I believe that the success factor was basically the attitude of the management team; if we wanted to criticize something we would say that it was a little adventurous, a little daring, a little bold, a little

reflective. But if we wanted to praise it or speak highly of something, we would say that it was brave. We had an extremely determined attitude to confront this permanent challenge of growth, with a great spirit of service, a great vocation to do things well, a very enthusiastic team, with many hours of work."

We have argued that leaders express power through their capacity to attract and influence others (as a centripetal force) and to give autonomy on a peer-to–peer basis, encouraging other network actors to spread the new way of doing business. The idea is that instead of having been *converted* to a new doctrine, actors in the network feel proud to contribute and co-create in many ways: experimenters (system engineers and programmers), cross fertilisers (multi-disciplinary knowledge from other areas), leaders in banks, for example, who promote new ideas, architects and designers, caregivers and storytellers. Co-creation is not, therefore, a solely generative activity; it also works as a diffusion mechanism since co-creation expands the network beyond its legal boundaries, as shown in Figure 7.3. Orchestrated Networks are based on this sense of pride, respect for individuality and autonomy, and team playing, are generative because they produce novelty, and behave like structures of diffusion for this new *doctrine* based on caring for each other, co-creating activities and commitment.

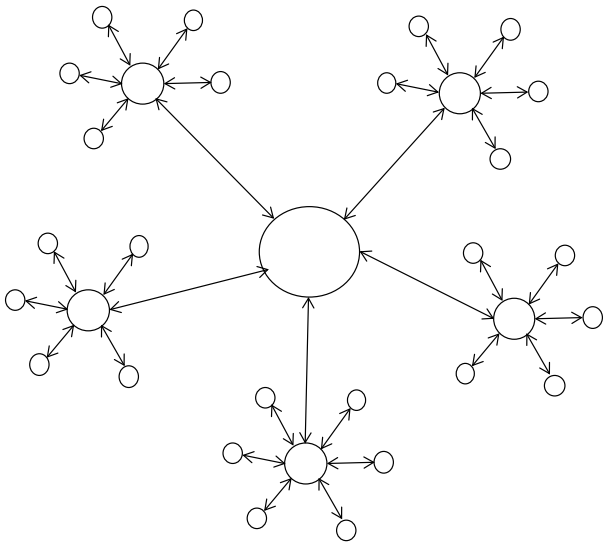


Figure 7.3: Orchestrated Networks: Innovation Generation and Diffusion

7.5. Economic Capacity

According to the research presented, the performance of innovation can be described using the following findings:

1. Reduction in time-to-market: for example, software is released every 6 months at the IBM Barcelona Lab, instead of 2 years, or IBM's taking advantage of the PC and internet as early detectors; similarly, Multiasistencia took 1 year to co-create the BNOS which was of greater quality and boasted more features, as opposed to the previous in-house version which took 2 years;
2. Increased customer satisfaction and loyalty: for example, according to one IBM executive, "For us, the subject of customer satisfaction was absolutely crucial: customer satisfaction with the solutions that we started up. And I can tell you that we have improved exponentially";
3. An increased level of control over innovation through mutual adaptation and integration projects: (1) on a technological level, taking advantage of previous investments and the existing technological base, and (2) on an organisational level regarding inter-organisational processes of software production and service management (both IBM and Multiasistencia), thus reducing transactional costs;
4. Reduction in IT transfer costs: a) initiating the innovation process through co-creation; b) identifying industry leaders who are willing to innovate (banks in both cases, in addition to trade professionals in the Multiasistencia case), and thus leverage the innovation diffusion of emergent leaders; and c) reducing co-ordination costs by giving autonomy and co-creative activities based on trust as argued in Chapter 5;
5. Increases in productivity: for example, a 50% productivity increase (2000-2003) in Multiasistencia and new software development in the IBM Lab: LAN-DP and WBCC.

We then argued that resilience is the innovation outcome in network changes. This is called resilience at the structural level, examining how much change the network has absorbed to reach a new equilibrium. Our research shows (1) members of the network co-creating with complementary equals; (2) some weak members trying to gain power in order to balance asymmetries, including the focal firm; (3) amicable (or otherwise) separations (or lock-outs) as seen in the cases considered. The degree of resilience can be synthesized by a phase, a motto, which in the case of the IBM Barcelona Lab was re-invention.

7.6.- Proposition: Orchestration as Leading Leaders

> ***Proposition** 7: Orchestrators lead leaders in the Network by making commitments and exerting peer-to-peer relationships.*

There is never a single leader in networks, as suggested by Merton's notion of ego-centric networks. There are many egos, and it is obvious that, what one person sees as the centre in the network is not the same as that perceived by the other actors. Managing business generation and trust were critical to the management of increased growth in the cases studied.

According to this researcher's observations, perhaps the most salient characteristic of orchestrators is their capability to lead and to be led when circumstances require. Orchestrators lead leaders, propose actions and engage other leaders by using power (of a variety of types ranging from inspiration, influence, and formal authority – where the hierarchy is there to support this they may help others to make sense of situations and/or use coercion when needed). Leaders are implicitly elected by teams and serve as references for innovation, exerting this role of centrality.

Leaders balance dependencies by giving autonomy, empowering people, improving work content and opening new sources of innovation. If we agree on the fact that people tend to do to others what management does to them (Milgram, 2005), then commitment will get commitment in return. The IBM

Barcelona Lab was based on autonomy, staffing "key people in key projects" these people (such as technical architects or sales people) were both from IBM and from banks, and dealt with bank and IBM leaders. In the Lab, it was quite the norm for a professional working in development to move on to the project group at the end of the development phase, later going to the client to implement the project based on the product that he or she was personally involved in the development of. Another interesting finding is group identification beyond organisational legal boundaries. In Multiasistencia, autonomy was clearly given to banks (providing them with information to keep track of claims) to trade professionals and to the CSRs that managed the entire process.

As mentioned above, IBM Barcelona Lab orchestrated its staff in different projects where they changed roles and functions, Independent Software Vendors (ISVs) but also hired project directors from the banks. Similarly, Multiasistencia staff was permanently rotating through major banks and developing strong relationships with top management. Since orchestrators lead formal and informal relationships, including those "outside" their organisations' legal boundaries, orchestrators normally command "external" and critical resources to their partner firms, such as key relationships with key customers and key associations, thus leveraging power with control over these resources.

Chapter 8: Conclusions: Perspectives on Innovation and Leadership

This thesis proposes the concept of *Orchestrating* Network Behaviour for Innovation as a managerial function that stands as a proposition and a theoretical hypothesis. Methodologically, it is the fruit of abduction, that is: (1) a creative synthesis and, at the same time, (2) a tool to analyse objective reality. This managerial function generates a path between the current state of affairs and structures and future ones, through the management of network structural dynamics and digital platforms, understood as the infrastructure for innovation. We have also examined network structural dynamics in two longitudinal cases that have allowed this researcher to review 25 years of these companies' evolution.

Orchestrating is a managerial function to set a *new path between the present and the future*, managing a process of ongoing equilibrium between actors' benefits and costs which can vary along the way. It is stressed here that setting a path is "changing the rules" while keeping the game alive - essentially, the principle of efficiency. This function is based on Strategic Leadership, which starts by creating a change in perspective, a new business venture that attracts people and resources. Leaders create networks naturally, but we argue that they require strategic management capacities in order to cope with strategic factors, dependencies and contextual variables. These capacities are required to manage real contextual variables. With this Orchestration function, we explore how management can open up new spaces for creativity to change the existing rules of the game, thus changing structures (not breaking them), as the function is an evolutionary process - a journey or a path - where efficiency is expressed by avoiding disruptions. As a managerial function, it is based on the power to: on the one hand, open new sources of innovation and, on the other, set commitments which shape network boundaries.

Commitment is a principle of demarcation: orchestrators exert power through commitments to control network boundaries, thus affecting the roles and

relationship dynamics which determine resolving structural dynamics. A complex structure (based on autonomy and voluntary association) requires boundaries to survive. New opportunities come from "multi-connected" and "multi-disciplinary" networks.

We have stressed this issue particularly in suboptimal regimes, therefore proposing resilience. In this respect, management is about dynamically regulating boundaries through centripetal and centrifugal forces in accordance with particular objectives and circumstances which can also shape roles and relationships. Therefore, Orchestrating Innovation is an ongoing process to change network structures in order to manage the players' autonomy and peer-to-peer relationships for co-creation, sharing investments and engendering trust, equity, holding conflict, and organising forward .

First, we emphasise that market creation is dependent on orchestrating, that is, autonomy, creatvity, commitments and trust. Second, we have already argued how complex structures need boundaries to survive and, by dynamically managing boundaries, they set paths for innovation. These structures lie between chaotic enviroments (with no autonomy), governed by an "invisible hand" or "too much of a vissible hands on approach". Third, we suggest that orchestrating innovation, although perhaps considered a meso-level and transitional phenomenon, highlights the deeply rooted natural behaviour for innovation through the investment of resources to create something new in contact with the uncontrolled flows ("ups" and "downs") of economic cycles. Moreover, we are not defending anything related to a strategic apex or "central planners" to control economic cycles. We stress, instead, how voluntatry associations of free people, orchestrated to build a new path, can serve as an integrative force capable of avoiding disruptions (during economic booms or depressions) by placing economic activity in real patterns, in other words, it is about knowing how to change the rules, not lead disruptions.

As shown in Figure 8.1, Orchestration is a managerial function with three proposed dimensions: Strategic Leadership, Structural Network Dynamics and the Management of Digital Platforms.

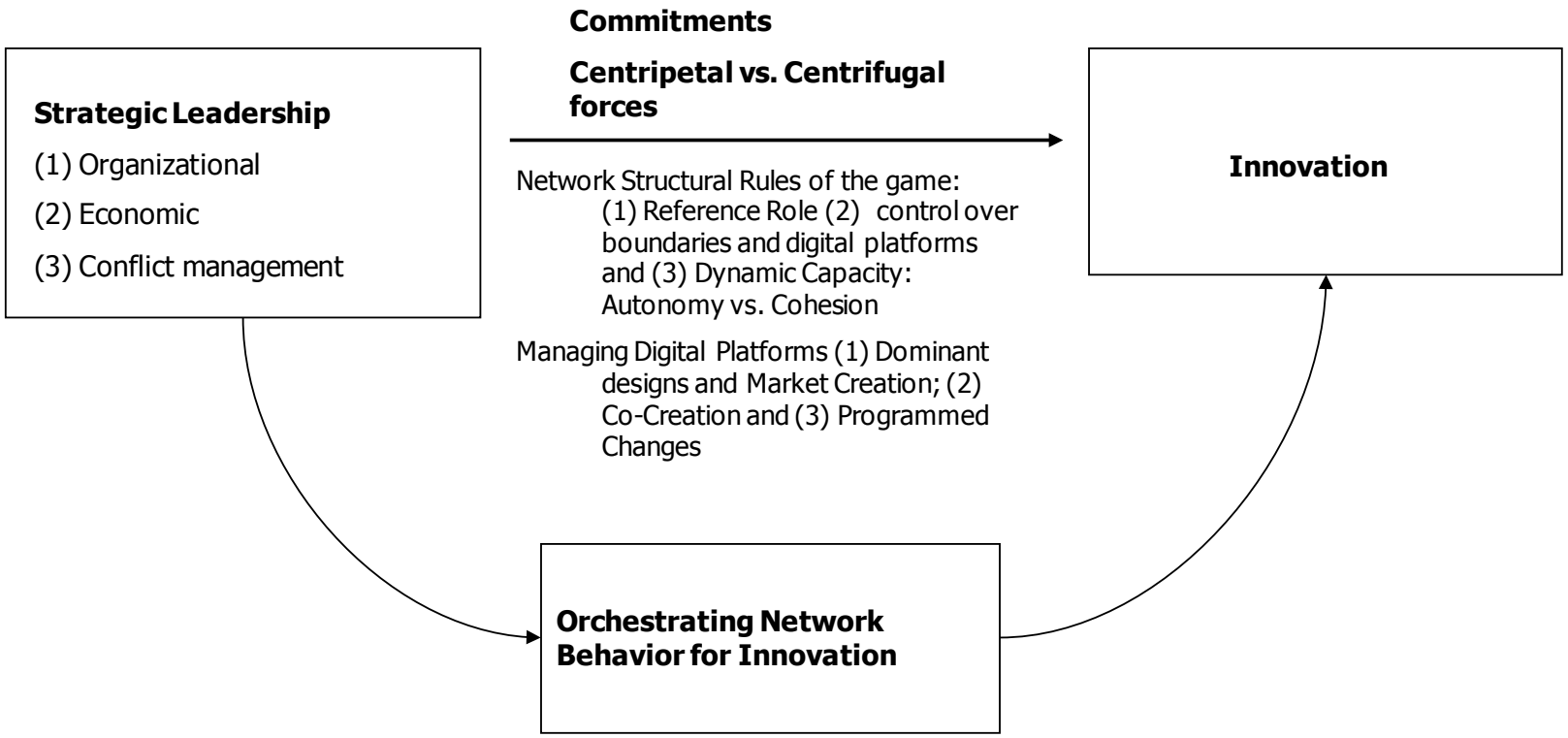


Figure 8.1: Orchestrating Network Behaviour for Innovation

In this empirical research, we have found that digital platforms: (1) facilitate the development of new business models and affect markets through dominant designs or references; (2) enhance co-production architectures; and (3) use programmed behaviour naturally linked to boundary management.

Leaders experience tension between authenticity and exploiting their own potential by stressing managerial effectiveness in terms of: (1) organisational capacities; (2) conflict management; and (3) financial results. The above discussion reflects the position held in his thesis. We turn now to a final discussion of the implications and contributions of this research, as well as the limitations and implications at different levels for future research.

Orchestrating and Power

By examining Structural Network Dynamics from the perspective of power, we have found the following characteristics in focal firms (or Orchestrators) regarding power in the following dimensions: centrality, control over resources, and dynamic capabilities. To date, the literature has focused on roles and, in part, on the management of resources.

First, we put forward centrality as the *Reference for Innovation*, emphasising that the locus of innovation is the network itself. In other words, the focal firm's role is that of reference to generate novelty by *opening new sources* of innovation and fomenting communication between actors to facilitate co-creative activities.

Second, power is about controlling boundaries defined as sets of commitments. This control is exerted by managing autonomy and cohesion. This stresses two main variables: autonomy and the predominant relational model among network actors (whether hierarchical or peer-to-peer). Moreover, we have shown that innovation outcomes are maximised when the relational schema is peer-to-peer, thus leading to Generative Networks and processes of Market/Factor creation. We have stressed this issue particularly in suboptimal regimes, therefore proposing resilience as another key characteristic.

Finally, orchestrating is about dynamic capacities which we have analysed using the metaphor of centripetal and centrifugal forces. Orchestrating recognises that the focal firm dynamically regulates boundaries or constraints (or the rules of the game) through commitments in accordance with the objectives and circumstances which shape roles and relationships. Commitments can be understood as dynamic agreements on direction setting, network behaviour and a way of holding conflict in structural changes. Orchestrating through commitments emphasises managing autonomy and recognising the actors' capacities to self-organise and control themselves, that is, making Orchestrating for Innovation a focal characteristic of the network.

Generative Networks

Generative networks are expressions of optimality as a result of Orchestrating Network Behaviour for Innovation, as has been shown by empirical research described in chapter 6. Orchestrating is based on commitments, balancing centripetal and centrifugal forces, engendering trust, a symmetric (peer to peer) model of relationships and co-creation.

The orchestrator exerts power, as argued, with the following actions: (1) the focal firm carries out different roles, but that of serving as the reference for innovation is predominant; (2) power is exerted through dynamic boundary control and setting constraints, thus establishing commitments, exerting autonomy and avoiding the extremely costly option of one-to-one supervision; and (3) facilitating co-creation, the emergence of dominant designs and the creation of market factors through positive value returns and network externalities.

The orchestrator exerts autonomy by opening spaces for new sources of innovation, boosting communication among actors, and through controlling digital platforms that provide an infrastructure for innovation, thereby giving *more autonomy to actors* by letting them build new applications, re-using and integrating them with existing applications and components to build more integrative solutions (in the IBM case) and new services (in Multiasistencia case).

Managing autonomy and commitments recognises that innovation can unfold anywhere and that orchestrating implies linking and communicating multi-connected resources or, applying legal boundaries, "internal" and "external" resources (classically called boundary spanning).

Autonomy is expressed through the proposal of new projects by composing software projects considered as the development of re-usable components, in other words, a re-combination of existing resources to expand the resource base, as dynamic capacities suggest. Additionally, this research has shown that project teams synthesise existing knowledge with new information, making it into interconnecting software modules which became the foundation for the modular architecture of digital platforms. Given the common problems and broad applicability of these processes, both focal firms quickly found (1) economies of scale and externalities that helped apply their digital platforms to other sectors of the economy with some additional modifications (for market creation), and (2) economies of scope as they became "innovation factories" for complex, process-intensive information services, thus balancing greater scope or breadth with greater focus and specialisation.

Orchestrating is a network capability, not only a question of the focal firm. With this approach, the network is the locus of innovation and Orchestrating is about opening and managing new sources: (1) network interactions among actors; (2) spaces for co-creation and generation of new modules/applications/services, and (3) the replication of existing models in new markets, industries and areas, as seen. The focal firms detected significant inefficiencies within the banking sector's business processes due to their profound knowledge of the business and administrative processes in the industry.

Orchestrating Network Behaviour for Innovation finds its *optimum configuration* when the predominant relational model is peer-to-peer and co-creative. Managing autonomy and commitments recognises that innovation can come about anywhere and that orchestrating implies linking and communicating "internal" and "external" resources and boundary spanning or bridging activities.

We have presented evidence that centripetal forces can be ideological, but that they hide asymmetries in deep structures (such as opportunism and other human passions) which are normally dismissed in organisational studies, but are critical to organizing for innovation. Scientific management is about repression, not containing conflict or setting boundaries for action. Creative destruction, in turn, ignores autonomy, trust and commitments, and assumes a reactive attitude based only on competitive elements, thus dismissing cooperative and co-creative actions. All these are based on denying autonomy, thus ignoring complexity and coming close to representing chaos.

Orchestrating Innovation contributes to the notion of loosely-coupled structures that lie between both configurations of chaos: tight structures and unstructured configurations (sometimes, with all preventions: markets and hierarchies). Both extremes can be chaotic because they restrict freedom and autonomy. Markets are conceptualized as being only market driven and opportunistic; bureaucracies rely on "scientific management" that normally hides profound asymmetries (that sooner or later unfold), cultivates arbitrary ways of organising creativity and autonomy, and that has the capacity to set commitments, that is, force people to "anomic" states.

By doing so, they condemn extremes to deterministic trajectories, almost reducing the levels of freedom to zero (in terms of the multi-connectivity and multi-disciplinary traits found in network behaviour), and drastically reducing the capacity to set paths of innovation. These chaotic extremes have a problem with the future (and, indeed, with innovation), since markets are unpredictable and bureaucracies are prone to *repetitive behaviour,* eventually producing outdated products and services for non-existing markets and jeopardising the firm's performance and its very existence in the future.

This notion is depicted in Figure 8.2. In short, networks are optimum configurations (although through processes using different steps; as discussed, this is not a "final" optimum, but a more modest process-based approach).Thus it is in between these two extremes that we find chaotic behaviour, notions

consistent with theories of complexity and psychodynamics (see Stacey, 2003), as the findings of this study have shown. We have seen how IBM almost faced extinction in the 90's, but we can also look at this from a different perspective. A small Lab in Barcelona that pioneered hybrid programming and solution driven business, today represents 50% of IBM revenues. The same can be said of Multiasistencia, a focal firm who had to confront deep changes from 2000 to 2003. In both cases, they pioneered what, in the end, became a very complex process of metamorphosis, changing the rules of the game and the resource base. Both focal firms brought networks to a new future.

Thus, Orchestrating Network Behaviour is a network's capacity to set a path, employing an inner capacity called *innovativeness* (connected creativities, and commitments) by managing dynamic equilibrium through (1) dynamically managing network boundaries and constraints, reinforcing the notion that no complex system can survive without boundaries; (2) unleashing the power of digital platforms as co-creative spaces, and (3) boosting multi-connectedness and multi-disciplinary teams. This thesis has shown how orchestrating stress (one of the roles of management) and providing illustrations of how to manage networks can be successful strategies for innovation *at the edge of chaos*.

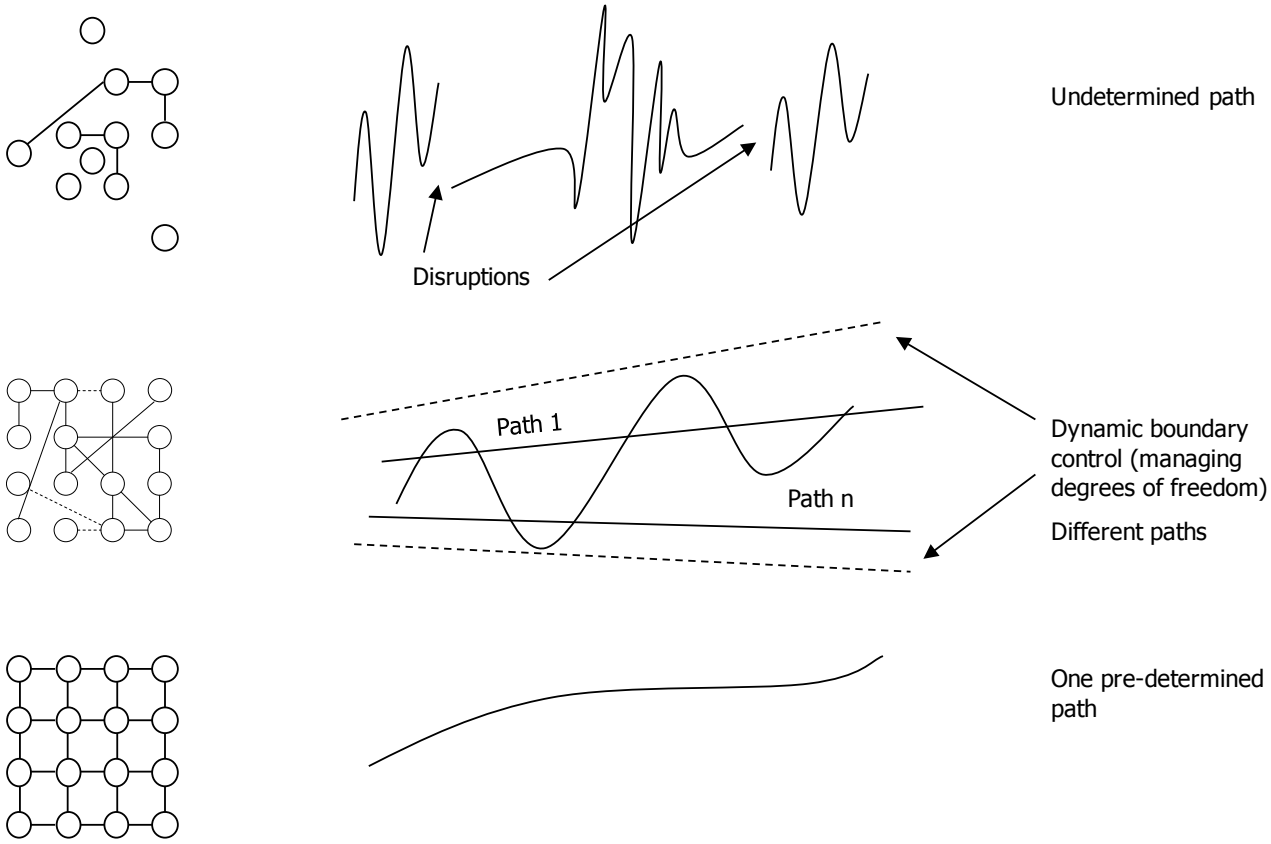


Figure 8.2: Paths for Network Behaviour

Innovation and Digital Platforms: Market Factor Generation

This thesis has proposed that orchestrating can generate new markets, although this is a first step to which more research must be devoted. This concept suggests that orchestrating is one way to command, and that it can generate optimal configurations or loosely-coupled structures based on commitments through establishing strategic relationships and multi-connectivity. This approach suggests that Orchestrating leads to: (1) the generation and diffusion of innovation, and (2) combining divergent and convergent behaviour (although there may be some predominant patterns depending on the phase).

This approach also suggests that Orchestrating Networks for innovation is a meso-level phenomenon that is driven by management. This means that in the first steps when activities do not have enough scale, trust and commitments are essential to create communities. Once the super-additive games create a critical mass, the logic seems to be price driven and solely competitive, thus drastically reducing the degrees of autonomy needed and dismissing the role of management for market/factor creation. Market logic tends to dissolve existing communities and increase competition and opportunism, thus reducing autonomy or, in other words, adding more constraints, which can reduce the ability to innovate.

In the Multiasistencia case, we explore the implementation of a specific Business Network Operating System (BNOS) which played a fundamental role in automatically regulating boundaries and ensuring expected behaviour. It achieved this through deterrent-based control systems to build trust, and increasing efficiency using information tangibility and transparency. In the IBM Barcelona Lab, digital platforms allowed the Lab to rapidly take advantage of the internet to develop multi-channel solutions for banks world-wide, building barriers to competition in this process of co-creation with banks.

In Figure 8.3 below, we present the three levels of commitment (1) digitally enabled; (2) co-creative and (3) irreversible lead by focal firm. Irreversible commitments (from point "B" to "C") lead to dominant designs and dominant business logic, although the path is based on a set of experiments, a set of steps until the new business logic is right. This process may also attract other actors that can incorporate new complements to the network and to the digital platform due to increasing returns and externalities or super-positive sum games. Although initial centripetal forces are grounded on the business opportunity, once the business grows, the attraction of natural forces of leadership and commitments can hide asymmetries due to opportunism.

In fact, digital platforms can be considered as a resource that can generate trust: (1) as a deterrent (for managing Service Level Agreements); (2) as a framing infrastructure for co-creating by standardize some processes; (3) as a knowledge synthesis of the inter-organisational learning process; and (4) as a network resource that can generate trust in the network. In this way, digital platforms may help to create new opportunities to collaborate and facilitate the recombination of this knowledge in novel ways. This can occur in the same or new relationships and co-ordination mechanisms, thereby fomenting business growth, change and further innovation. We have highlighted information systems and the digital platform, in particular, as proxies for commitments and also as a communications system and a creative space. Creativity in social settings may be part inspirational, but it also requires perception and communication in order to become a structural process.

Orchestrating with digital platforms recognises automatic boundary setting for network behaviour (as the Multiasistencia case shows). In this case, the structural pattern or behaviour was driven by an information system setting a specific set of constraints to limit degrees of freedom. The second role information systems play is that of a standard and standardisation platform for the development of new software modules for the specific function of front-office and back-office integration in the banking system. Although business functions are different, the social and structural functions are similar: to set boundaries for human activities and set standards for behaviour. We represent this as a

horizontal line that limits the "levels of freedom" in our diagram of cycles, with the hypothesis that "ups" and "downs" can be held at this level; in other words, boundaries of action can be set.

After analysing "up" dynamics, we now discuss "downs" and sub-optimal regimes. Once a new dominant design emerges, the competition (both external and internal) that aspires to this position will focus on prices to take advantage of the new design's weaknesses and offer the same product at better prices, focusing on large-scale production. Orchestrators generally focus on the design and deployment of specialised assets, that is, the generation of new modules through co-creative activities and more specialised assets which are more difficult to copy. Examples of this can be clearly seen during the more mature phases within the IBM Barcelona Lab and Multiasistencia cases.

The following figure highlights, in the ascending lines, centripetal forces predominate, extending limits and generating a positive sum game. Here the orchestrator generates value for the network actors through maintaining control over the technological strategic resource in order to absorb a greater part of the value created. It is here that the commitments are expressed in the form of exerting autonomy and co-creation.

Once an optimum is achieved, the scale factor reveals a fact which requires further research. The way down starts with the product/services' maturity, community dissolution and competition (external in markets and internal/external in global firms). It may be the case that everyone can (or knows how to) establish commitments at the individual level (Bowlby, 1980: 1985), and price and competition become the forces behind this co-ordination. With this set of constraints, factor generation strategies have to make way for the market by positioning strategies and investments in terms of differentiation in order to maintain the equilibrium (Wernerfelt, 1984). Managing from point "C" to "D" in the figure below requires controlling the risks associated with the dissolution of the co-creative community and competition. Obviously, each case will indicate how these variables are quantified.

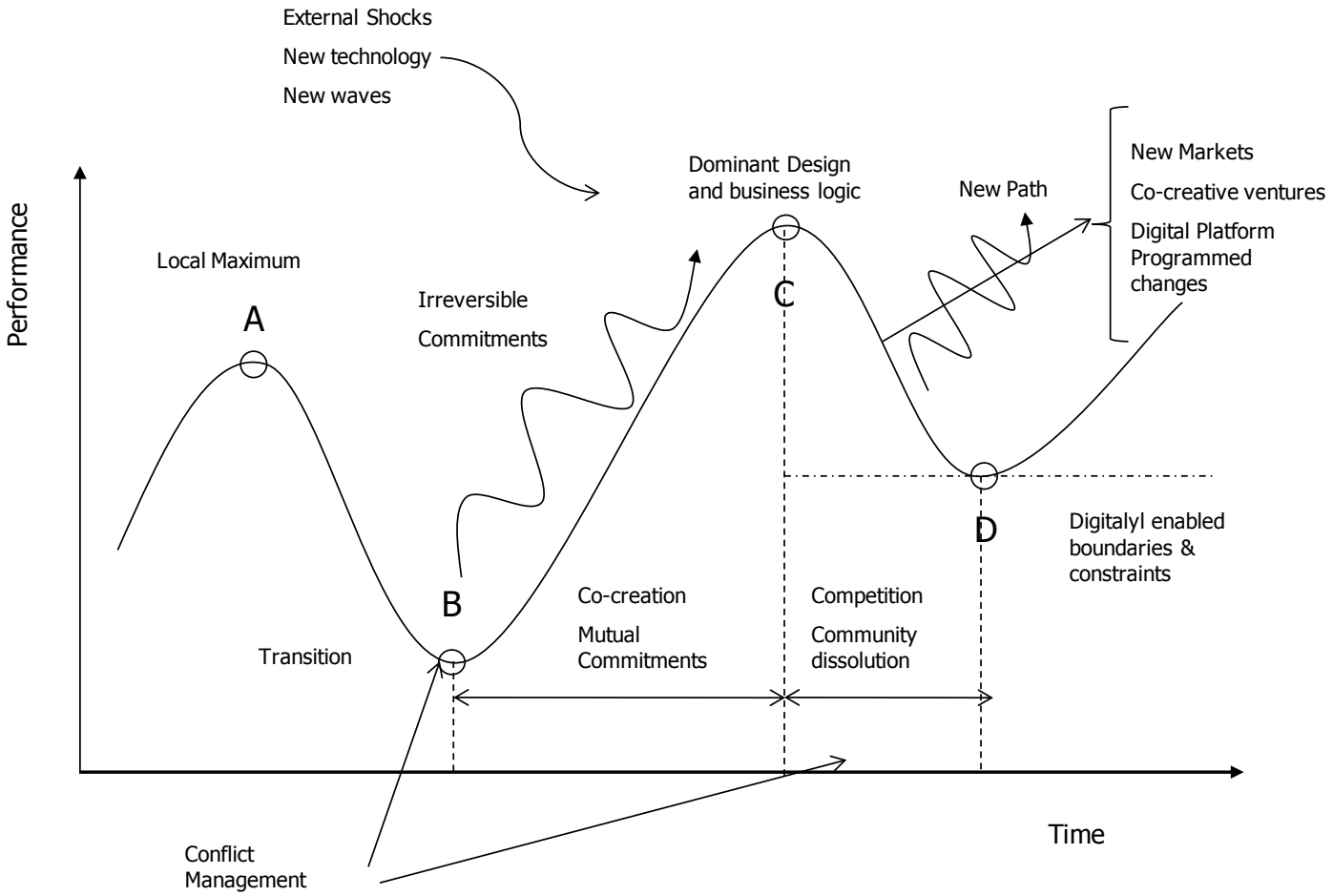


Figure 8.3: A Dynamic View of Orchestrating

As argued, if the scale becomes too large, it seems that dynamics are superseded by market rules, competition and opportunism, not commitments. Transaction Cost Economics can predict this fact, and, according to this research, this is true in the absence of commitments as boundary criteria. If the criteria to mobilise resources are driven by price, then Transaction Cost Economics can predict that valuable resources will tend to be in-sourced by firms. In the IBM Barcelona Lab case, once a dominant design was released, the major risk faced by the Lab was the dissolution of the technological community due to internal competition (as a hypothesis) and internal policies favouring off-shoring.

However, we argue that networks and digital platforms can reach optimum states for innovation which engender the dynamics for market creation, through which actors can exchange ideas, and then projects and new services can shape the network's structural dynamics. Nevertheless, even when a leading design is achieved and management becomes hierarchical with the rules set by product/market activities, the way down to a new transition is always hidden. This leads to the choice of starting a new orchestrating venture to manage commitments and constraints in order to avoid disruptions, and leading network behaviour for innovation to create new factors and new opportunities, thus emphasising value regimes based on equity or "growing together," containing conflict and organising forward.

Network Leadership

Network Leadership is about changing the rules of the game, attracting people and emphasizing relational capacities and political mastery. Leaders are early detectors of innovation and conflict. Sources of conflict are similar to innovation: hidden asymmetries or new waves that require more than superficial changes, but changes in deep structures, shaping network behaviour.

Leaders contain (instead of repress) the emergence of innovation (and conflict) and thus commit to teams and objectives (irreversible in some cases). This

achieved by Network Leaders leading other leaders, who generate and disseminate innovation. Network leadership is about dynamically managing boundaries, developing innovation sources, enhancing communication and dialogue, and focussing on team performance and business objectives. Network leaders emphasize commitments, that is, they set the direction and monitor it. As a result, they make the network the locus of innovation by promoting strategic relationships for co-creation. In contrast with the idea of leadership as a disruption, we argue that leaders should take care of the organisation by linking the organisational memory, the present state of affairs and possible future one, that is, by linking the old with the new.

The first important factor in power is authenticity as an expression of full power over oneself. This is commitment or a commitment to oneself. Leaders also commit to their *crews*, referring back to the Ulysses myth. They naturally attract people, including people from inside and outside of *formal organisations*. Leaders naturally exert power by giving autonomy to invite people to work by themselves in order to engage in peer-to-peer relational dynamics that lead to co-creation. Orchestrating Innovation thus becomes a focal characteristic of Generative Networks which are based on opening new sources of innovation and combining them through structural communication processes. Orchestrating Generative Networks is about how to crystallize different ideas, knowledge and other resources to turn them into viable innovations.

Not all managers are leaders, and not all leaders occupy managerial positions. In both cases, management and leadership are expressions of power that affect how innovation unfolds in organisations. We have argued how important it is for leaders to understand and exert managerial capacities. Due to their natural gift for attracting people, leaders have a natural attribute for giving autonomy. Commitment is the force that keeps the network united and allows it to renew the resource base of firms and re-organise economic factors and activities to engage in novelty and encourage innovations, that is, ensure its long-term survival. We have also briefly explored the complex relationships between leaders and how this variable shapes innovation.

Since organisations are made up of several leaders; the way they establish relationships with others inside and outside of their organisations is important, that is, how they establish networks of mutual influence. The question is how to determine a systematic method with which to understand *how leaders interact*, how they interact with followers, how they manage different types of relationships and different games at the same time, exchanging resources, and how they establish relationships between organisations. Orchestrating Network Behaviour for Innovation is a managerial function that explores this activity by placing "key people in key projects," emphasizing the role of network leadership and its managerial effectiveness in terms of communication, financial outcomes and organisational capacities to manage relationships to produce novelty and innovation.

In Table 8.1 below, the limits between perspectives are not clear-cut. Roles vary, but this table reflects the interpretation of this researcher. Network Leadership is about Governance and resilience, that is, the capacity to modify the level of control according to the circumstances. It also requires having the resourcefulness and flexibility to adapt to a changing situation and the ability to process painful and conflicting information. Moreover, we have argued how important it is to cultivate politics, alliances, networking and understanding of the games of others, looking at all these questions with distance and dealing with them in a positive frame of mind.

In the cases studied, we have proposed some additional perspectives that will require more work and fine-tuning in further research.

	Commanding resources	**Market Factor Creation**	**Building Identity and Purpose**	**Managing Conflict**	**Generative Networks for Co-creation**
Leadership Roles or Different Ways to Attract (Pull)	**Commander**	**Entrepreneur** Recognition (in all phases) Agitators	**Integrator/ Institutional** Connecting the old with the new	**Mentors – Care: Holding and Expanding** Communication Resilience Exert autonomy	**Reference** Capacities: organisational, economic (tangible) results and recognition. Resilience and conflict management
Structural Change: Roles, Relationships and Boundaries	Boundary reminder Exert control over resources (formal and informal): recognition and sanctions; technology; relationships	Boundary expansion (centripetal forces prevail) Positive returns (risk of asymmetries) Network externalities Control over: (1) resources; (2) intellectual property; and (3) "complementors"	Boundary reminders Dynamic adaptations: equilibrium between centripetal and centripetal forces	Centrifugal forces may prevail: competition and community dissolution Focusing on symmetries and complementary factors among peers to co-create and make investments	Boundaries controlled by peer-to-peer negotiations Self-controlled autonomous actors Co-creation
Digital Platforms	Deterrent Standards	Digital Platform as ideation	Strategic and structural resource	Deterrent SLA	Component-based digital platforms Complementary digital assets
Human Passions	Maintenance of trust	Personal trust in the leader / venture (expectations)	Maintenance of trust	Focus on trust generation	Interactive trust among peers Trust in the network Trust in the digital platforms

Table 8.1: Leadership Perspectives

Limitations

As with any research study, this project has some limitations that warrant attention. First, all research on networks suffers from the difficulty in delineating the unit of analysis, as many levels of analysis are intertwined in networks. If innovation is an expression of leadership and both appear everywhere in the organisation, how, then, does management deal with this phenomenon? How do leader-to-manager or leader-to-leader relationships influence the practical use of the innovation, avoid destructive conflicts and generate value for the organisation? A second limitation is that this research is based on two case studies, thus requiring validation with more empirical research. Achieving additional qualification and validation across larger samples is an obvious goal for a larger research agenda.

Other limitations are related to further questions regarding factor and market creation. Can orchestrating be found in organisations facing market growth? And if so at what level? How are dependencies and market rules combined? How do we link market rules and new ubiquitous digital systems to Porter's model? What are the key variables? Digital platforms reveal lock-in, clear boundaries, defined functions and clear connectivity protocols to ensure functionality. This approach contrasts with the argument of innovation networks, highlighting the capacity to exert autonomy in actors and thus generating lock-out. How do we address these issues?

More research is required in terms of dynamic capacities and the process of co-operative experimenting, exploring, and opening the network to new voices. This researcher sees several different issues here: What are the costs and limits of diversity and differentiation? We know that managing heterogeneous groups is difficult. Moreover, peer-to-peer networks are not exactly diverse. How can we combine both? How do we manage differences in absorptive capacities? How do these differences affect the recombination of resources for innovation? How can incentives dynamically affect the network's evolution?

More research is needed on the "innovation manager" theme, accountability, since managerial performance and accountability are subject to discretionary assessment. How can you account for innovation results? In the cases studied, this was an important issue and merits further research.

While we believe that this contribution breaks new ground, we also recognise that future research should consider the co-ordination mechanisms that govern network behaviour for innovation and their differences with other units of analysis.

Final Remarks

The construct *Orchestrating Network Behaviour for Innovation* highlights the governance of different voices and co-creative processes, which work through setting boundaries and changing rules of the game according to circumstances, rather than exerting power to "destroy" people's creativity and natural capacities (or condemn people to anomic contexts). Therefore, networks are strategically orchestrated contexts where dynamic, inter-organisational relationships allow for collaborative action to innovate. Relationships are also complex phenomena that require different levels of analysis to understand their co-dependency mechanisms and how these affect deep structures and network behaviour. Finally, we have described the specificities in peer-to-peer production relationships as activities between peers or equals in a hierarchy, but heterogeneous in the recombination of complementary assets such as knowledge and technology. This combination generates trust for the orchestrator as a reference (or the interactive lighthouse of the network) and is interactive at the relationship level.

Now the ship is reaching harbour and has to be docked. Network Leaders, as in Ulysses' journey, steer ships across the seas of ideas and reality, navigating and bridging the past (and memories which are expressed through behaviour, a style and some routines at the social level), current reality and the future. The path for network behaviour for innovation is found precisely on this journey. It is the

capacity to build non pre-defined futures, thus requiring autonomy, creativity and dynamic setting of constraints to define behaviour. Network behaviour creates structures which shape further network behaviour. This is why complex systems cannot survive without constraints or with too many or too tight ones.

Setting a path requires facing the unknown. Science and rationality are symbols of commitments (or binding rationality). Leaders must know their weaknesses and bind themselves to the mast. Like Ulysses, they are symbols of courage and power through the commitments they establish are symbols to themselves, to their *crews* (asking commitment in return) and to the ship. Leaders see the world through new perspectives, but require Strategic Management to steer ships through the murky waters of time and the changeable weather conditions of organising: what has been, what is, and what may be.

Orchestrating is a managerial function that enables a network capacity, which is not a characteristic of one individual or a single focal firm. It is in this context where Network Leaders steer sets of commitments to build new paths. The critical variables are first: the capacity to build references, second: understanding that circumstances vary along the way, and third: managing dynamic constraints to balance autonomy and multi-connected networks with limits of action to optimize creativity and communication. Network Leaders exert power as a continuous process of dynamically controlling boundaries by reaching a series of optimums, opening new spaces by regulating boundaries, and taking advantage of the potential power of digital platforms. When boundaries expand, it is like opening a window - the air is colder but also fresher. Leaders are in command and give autonomy by putting rules of the game (boundaries) in place, mobilising resources, recognizing waves (unfolding mainsail when needed) and setting direction in co-creative ways, and managing key people in key projects (leading leaders). Leaders steer the ship by showing resilience, that is, by binding themselves to the mast, while at other times being unleashed in order to orchestrate network behaviour towards innovation.

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