

## Preface

### **THE ROLE OF ORGANIZATIONAL CREATIVE AREAS (OCA) IN DYNAMIC INNOVATION: FROM COMPETITIVE ADVANTAGE OF INDIVIDUAL RATIONAL ECONOMICS TOWARDS DEVELOPMENT OF COLLECTIVE SUSTAINABILITY**

#### **Genesis and Overview: The Organization as Mediator between Entrepreneurs and Innovations**

This book represents the culmination of an international project to compile multi and inter-disciplinary research that most contributes to innovation. The book's unifying constructs are innovation and the organization. The organization mediates between entrepreneurs and innovations. This preface presents a brief overview of developments concerning the organization and innovation.

Organizations have gradually grown in importance throughout human history. They matured after the Industrial Revolution began in Europe in the 18<sup>th</sup> century and later spread to the United States of America in the 19<sup>th</sup> century. The gradual transition from a non-industrial to an industrial society has marked the frontiers between periods of evolution and industrial development of organizations. Here, the term evolution assumes that changes in society are relatively unpredictable, whereas industrial development denotes a more predictable sequence of planned modernization (Richter, 1982). Evolution characterizes processes of organizing in ancient and the Middle Ages civilizations, and the Renaissance supported development of the Industrial Revolution in Europe.

Many modern principles of organizing emerged during ancient civilizations (5.000 B.C. - 500 A.C). It is probable that organizing processes began in the family, later extending to the tribe, and finally reaching formalized political units (Wren, 1987). After the fall of the Roman Empire and the emergence of Feudalism in Europe, new principles of organizing evolved as solutions to economic and political crises. An increasing record of writings about organizing characterized the Middle Ages. Nevertheless, economies and societies were essentially static, management practices were still largely antihuman, science was only a philosophical rather than a technological concern, and political values involved unilateral decisions by central authorities. These conditions were unfavorable for developing an industrialized society.

Crises in Europe during the 14<sup>th</sup> and 16<sup>th</sup> centuries brought a revolution in thinking and culture, together with religious, social, economic and political strife, giving genesis to the Renaissance (Delouche, 2001). The Renaissance brought a new focus on reason, discovery, exploration and science. Overseas expansion of Europe between the 15<sup>th</sup> and 18<sup>th</sup> centuries strengthened the confrontation and integration of cultures on different continents and gave birth to Mercantilism. Globalization and a worldwide economy evoked new technologies and more complex principles of organizing. Additionally, there was increasing need and call for practices that could bring ethics to individual liberty and to markets. Political philosophers

began to disseminate new ideas about equality, reason, justice, the rights of citizens, governance by consent of the people, and decentralized of political power.

In the 18<sup>th</sup> century, new economic theories challenged Mercantilism and the controlling power of the landed aristocracy and initiated the Industrial Revolution. In his *Wealth of Nations*, Adam Smith (1723-1790) established the classical school of liberal economics and he proposed that only markets and competition should be the regulators of economic activity. The transition from pre to post-industrial organizations was gradual. The transition created new social, economic, technological and political conditions and brought new societal challenges. Continuous advances in science and technology, especially in electricity, energy and information, made possible large combinations of humans and machines, giving origin to new kinds of organizations. Principles of organization and management had to be improved and extended to a new and increasingly dynamic environment. Theories of organizations have developed systematically since the beginning of the 20<sup>th</sup> century. Organization theorists have advanced in knowledge through the 20<sup>th</sup> century (Grusky & Miller, 1981; March, 1965; March & Simon, 1958; Pugh, 1997; Nobre, Tobias & Walker, 2009: 236-289; Scott, 1998; Simon, 1997).

With advances in capitalism and liberal economics, philosophers, historians, political economists and sociologists proposed opposing ideologies and models of political, economic and social thought. Perhaps, Marxism was the most revolutionary political ideology. Marx and Engels supported the idea that capitalism inevitably produces internal tensions that lead to its collapse or destruction.<sup>i</sup> This Marxist process has been called Creative Destruction (Reinert & Reinert, 2006: Chapter 4). Later, the concept of Creative Destruction was revisited and popularized by Joseph Schumpeter (McCraw, 2007), and became most associated with his economic development and innovation theory, particularly from his books *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle* (1912/1934) and *Capitalism, Socialism and Democracy* (1942/1950). Despite being sympathetic to Marxian Doctrines, Schumpeter placed entrepreneurship and innovation at the center of his economic development theory. He said destruction, transformation, and renewal of a social-economic system are rooted in entrepreneurs' decisions and actions that introduce innovations. Therefore, entrepreneurs, and innovations, are core elements that can disturb the equilibrium of any social-economic system and that accelerate economic growth (Schumpeter, 1939).

However, to think about innovation, and especially technological innovation, only as synonymous with economic growth is to overlook its broad significance for humanity. While innovation and technology can benefit humans with artifacts that raise living standards (Easterlin, 2000; Johnson, 2000; Tidd, 2006; Tidd, Bessant & Pavitt, 2005), innovation and technology can also have negative results.<sup>ii</sup> Innovation and technology affect political power (Kipnis, 1990; Scarbrough & Corbett, 1992) and power-holders of innovation and technology can control resources and decisions (Suarez-Villa, 2009).

Strongly influenced by the Corporation (Drucker, 1993) and by the hegemonic power of 20<sup>th</sup> century neo-Corporatism (Hagger, 2004; Suarez-Villa, 2009; Wiarda, 1996), society has entered the 21<sup>st</sup> century with the strongest desires for capital accumulation ever seen in history. These desires have accelerated environmental degradation and the destruction of natural resources (Leff, 1995). Egocentrism, individualism, and consumerism characterize contemporary society, and a political and economic model of maximization of production and consumption is generating cultural alienation and intense materialism. These have, in turn, destroyed environmental resources and eroded the values and social conditions of humanity (Nobre, Lourenço & Fagundes, 2010). Education and innovation stand out as processes that should be changing human behavior to develop a sustainable future (Dunne & Martin, 2006; Wals, 2009),

and innovation offers a key to sustainability by contributing new alternatives (Hart & Milstein, 2003; Nidumolu, Prahalad & Rangaswami, 2009; Rainey, 2006).

One day, organizations, nations and executives may be able to perceive and act based on models grounded in systemic sustainability. These new models will have to reconcile environmental, social and economic demands (Gladwin, Kennelly & Krause, 1995; Korten, 2006) - the “three pillars” of sustainability defined by The United Nations General Assembly during the World Summit Outcome, in 2005. Organizations and their participants, especially entrepreneurs, will have to create dynamic innovation and competitive advantages without disrupting the balance needed for survival of the human species (Nobre, Tobias & Walker, 2010:391).

## **Objectives: What the Book is About**

Chapters in this book address many recent theories and practices on innovation. The book contemplates economic, social, political, educational and environmental facets of innovation through technological, managerial and organizational perspectives.

More specifically, this book is about innovation in firms, industries, nations and society. It speaks to professionals and researchers who want to improve their understanding of dynamic innovation and sustainable development. Chapters contribute answers to questions on:

- What are the roles (and contributions) of Sustainability in (for) Innovation?
- What are the roles (and contributions) of Organizational Networks in (for) Innovation?
- What are the roles (and contributions) of Entrepreneurship in (for) Innovation?
- What are the roles (and contributions) of Knowledge Management in (for) Innovation?
- What are the roles (and contributions) of R&D&T (Research, Development and Technology) Management in (for) Innovation?
- What are the roles (and contributions) of Marketing in (for) Innovation?
- What are the roles (and contributions) of Finance in (for) Innovation?
- What are the roles (and contributions) of Internationalization in (for) Innovation?
- What are the roles (and contributions) of Information Systems in (for) Innovation?

## **Key Concepts of the Book**

In this book, innovation involves processes, organizational elements (or resources<sup>iii</sup>), and Organizational Abilities (OA)<sup>iv</sup> that support the production and transformation of knowledge into new knowledge, processes, structures, technologies and products, goods and services. At the firm and industry levels of analysis, innovation can provide organizations with strengths relative to other firms, clusters, and nations and it is a key source of customer benefits and sustainable development. At the collective and societal levels of analysis, innovation can provide humanity with economic, social and environmental wealth through sustainable development.

The uniqueness of this book lies in the participants’ efforts to identify Organizations’ Creative Areas (OCA) that can provide core competencies for the organization in pursuit of dynamic innovation and sustainable development. In this perspective, innovation is a dynamic system and it is contingent upon a set of core competencies that couple to each other. Therefore, changing of even one competence can affect the organization’s ability to innovate.

Core competencies develop within Organizations' Creative Areas (OCA) that include Sustainability, Organizational Networks, Entrepreneurship, Knowledge Management, R&D&T (Research, Development and Technology) Management, Marketing, Finance, Internationalization, and Information Systems. Core competencies are valuable and unique from a customer's point of view, and also inimitable and non-substitutable from a competitor's point of view (Prahalad & Hamel, 1990). Core competencies can represent collective knowledge that develops through learning and that provide strengths relative to other organizations (Nobre, Tobias & Walker, 2010; Nobre & Walker, 2011). The term dynamic refers to capacity of the organization to create new competencies and to adapt to the changing business environment (Teece, 2007).

The concept of competitive advantage refers both to the position that a firm occupies in its competitive environment and the firm's ability to create superior value for its customers and superior profits for itself (Porter, 1998). The organization can sustain competitive advantage by developing strategic resources and core competencies (Lei, Hitt & Bettis, 1996). Although some chapters in this book support this economic concept of competitive advantage, that concept makes assumptions about economic supremacy that separate humanity from ecological and social developments. Therefore, this Preface avoids the term competitive advantage and adopts a more fruitful perspective of sustainable development—"the process of achieving human development ... in an inclusive, connected, equitable, prudent, and secure manner" (Gladwin, Kennelly & Krause, 1995). An inclusive perspective sees traditional competitive advantage as occupying one extreme, whereas truly sustainable development occupies the opposite extreme. Sustainable development must benefit not only the organization and its customers, but also the whole society and the future of humanity through sustainability.<sup>v</sup> Most chapters of this book fall between these extremes.

## The Dynamic Model

Figure 1 portrays innovation as interacting with the Organization's Creative Areas (OCA). In this Figure, the Organization's Creative Areas [OCA-(1...9)] include Sustainability (Sus.), Organizational Networks (ON), Entrepreneurship (Ent.), Knowledge Management (KM), Research, Development and Technology (R&D&T) Management, Marketing (Mar.), Finance (Fin), Internationalization (Int.), and Information Systems (IS).

Figure 2, adapted from (Nobre & Walker, 2011), portrays the organization in pursuit of dynamic innovation and sustainable development. This model's functional processes can be summarized as follows:

- First, the organization interacts with the environment through its Organization's Creative Areas (OCA) and Organizational Abilities (OA) for acquisition, exchange, processing, creation, storage, renewal, distribution and employment of resources. By these processes, the organization evolves and improves its own abilities of cognition, intelligence, autonomy, learning and knowledge management.
- Second, the Organization's Creative Areas (OCA) and Organizational Abilities (OA) manage strategic resources, and, consequently, develop the organization's core competencies. Improvements in strategic resources as well as in core competencies can feed back and provide improvements in the Organization's Creative Areas (OCA) and Organizational Abilities (OA).
- Third, internal and external stimuli can affect the Organization's Dynamic Innovation and Sustainable Development (ODISD), and, consequently, changes in ODISD activate the

Figure 1. Organization's Creative Areas (OCA)

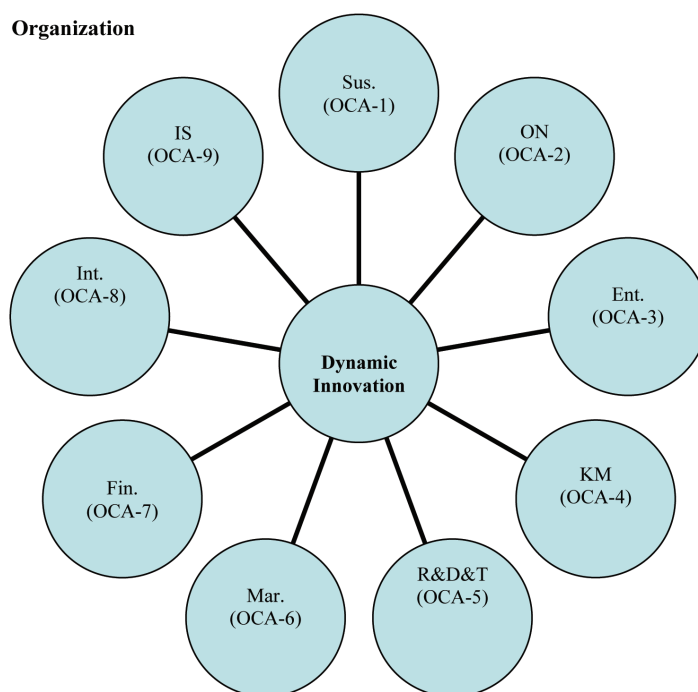
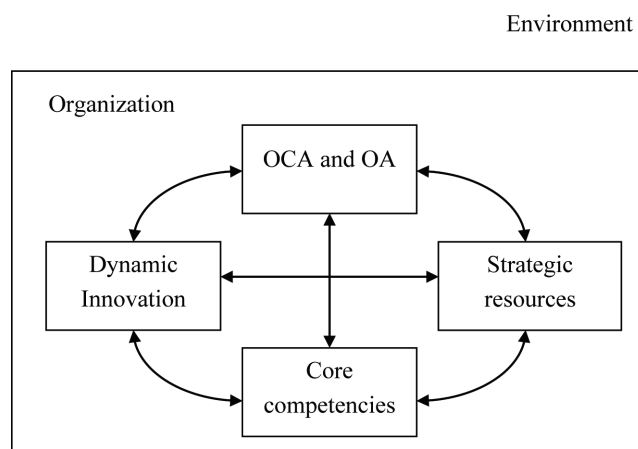


Figure 2. Dynamic Innovation Model



Organization's Creative Areas (OCA) and Organizational Abilities (OA), thus starting new cycles of sustainable development.

Processes (1) to (3) repeat continuously to reduce environmental uncertainty and to improve the Organization's Creative Areas (OCA), Organizational Abilities (OA), strategic resources, core competencies and the Organization's Dynamic Innovation and Sustainable Development (ODISD).

## Target Audience

This book is most relevant to researchers, students and executives interested in future organizations that pursue dynamic innovation and sustainable development. The technological, managerial and organizational background addressed in this book can be applied in different levels of academic and industrial research, including:

- Research programs of undergraduate and post-graduate levels.
- Lectures of undergraduate and post-graduate courses.
- Industrial and business research projects of firms of any size.

Due to the multidisciplinary scope of this book, the editors are suggesting some schools and courses where the book can be useful. These are:

- Schools of: Business Administration, Management, Information Systems, Organization Theory, Social Sciences, Economics, Sociology, Philosophy, Education, Technology, and Engineering.
- Courses on: Innovation; Organizational, Managerial and Technological Innovation; R&D and Technology Management; Organizational Theory, Organizational Learning; Knowledge Management, Information Systems, Finance, Organizational Networks, Internationalization, Strategic Management, Marketing, Entrepreneurship, and Sustainability.

The book offers readers a multidisciplinary perspective on dynamic innovation, and most importantly, challenges readers to explore new frontiers between innovation and Sustainability, Organizational Networks, Entrepreneurship, Knowledge Management, R&D&T (Research, Development and Technology) Management, Marketing, Finance, Internationalization, and Information Systems.

Organizations of today confront increasing levels of environmental complexity and uncertainty (Nobre, Tobias & Walker, 2010) that demand new processes of organizing. Sustainable development, at the firm, industry, nation and societal levels, depends on new economic, social and environmental analyses. This book contributes by presenting theoretical and empirical findings for mastering, analyzing and integrating technological, managerial and organizational perspectives that identify core competencies of future organizations. The subject of dynamic innovation raises new challenges for researchers.

Organizational, managerial and technological principles of the past and present have contributed successful applications in many areas of organizations and society. However, the world is changing, new processes of organizing are continuously emerging, and methods that proved successful in the past may not provide the right tools for addressing problems of the future. Participants in this book hope to provide readers with very exciting insights about how innovation can create a better future.

## Book Structure and Chapters Synopsis

The Editors' goal is to foster cross-pollination among researchers. To this aim, the Editors have selected and assembled chapters that illustrate multidisciplinary theoretical perspectives and empiric results on innovation and the roles of Sustainability, Organizational Networks, Entrepreneurship, Knowledge Management, R&D&T (Research, Development and Technology) Management, Marketing, Finance,

Internationalization, and Information Systems in the organization that pursues dynamic innovation and sustainable development. The book's structure involves these major sections:

- **Section 1:** Sustainability and Innovation
- **Section 2:** Organizational Networks and Innovation
- **Section 3:** Entrepreneurship and Innovation
- **Section 4:** Knowledge Management and Innovation
- **Section 5:** R&D&T Management and Innovation
- **Section 6:** Marketing and Innovation
- **Section 7:** Finance and Innovation
- **Section 8:** Internationalization and Innovation
- **Section 9:** Information Systems and Innovation

## Section 1 on Sustainability and Innovation Subsumes Seven Chapters

In Chapter 1, *“Environmental Rationality: Innovation in Thinking for Sustainability”*, Leff proposes perspectives and concepts for a model of environmental rationality for the construction of a sustainable society. He argues that “rationality of modernity has limited capacities to reestablish the ecological balance of the planet, while environmental rationality opens new perspectives to sustainability: the construction of a new economic paradigm based on neguentropic productivity, a politics of difference and an ethic of otherness. The problem to be approached is that of understanding the unsustainability of the established, dominant and hegemonic ways of constructing the world we live in: that of economic, scientific and technological rationality which organizes the actual world order. Humanity needs to think about the possibilities of deconstructing this dominant rationality, constructing and putting into social action a new social order: a new agreement with nature based on environmental rationality”. In this prominent treatise, Leff concludes that innovation in thinking is a need, if not a must, for sustainability.

In Chapter 2, *“A Model for Improving the Adoption of Sustainability in the Context of Globalization and Innovation”*, Rainey presents the foundations of a conceptual model for connecting the key elements necessary for corporations to adopt sustainability in the context of the global economy and strategic innovation. He explains “while sustainability involves many perspectives, strategies, actions, and management constructs, the chapter focuses on how global corporations employ strategic innovations in response to the driving forces in the global economy and how they can improve their level of management sophistication in a turbulent business environment”. One of the Rainey's conclusions is that the model provides a framework for creating win-win outcomes that are balanced in terms of the social, political, economic, technological, environmental and ethical forces.

In Chapter 3, *“Product-Service Systems as Enabler for Sustainability-Oriented Innovation: The Case of Osram's Off-Grid Lighting”*, Große-Dunker and Hansen emphasize the role of innovation for addressing sustainability as well as the role of sustainability as a source for innovation, whereas they propose that Product-Service System (PSS) represents an important approach for both perspectives. Große-Dunker and Hansen start by presenting an exploratory research strategy to further investigate the links between Sustainability-Oriented Innovation (SOI) and Product-Service System (PSS); and they go through a case study on off-grid lighting in Kenya and analyze the sustainability effects on the product and Product-Service System (PSS) level.

In Chapter 4, “*Innovation for Sustainability in Aviation: World Challenges and Visions*”, Nakamura, Kajikawa, and Suzuki collect and analyze the latest experts’ talks from four international meetings on Aviation and the Environment in the period between September 2009 and May 2010. The talks in the international meetings were led by experts and researchers from Japan, Europe, and North America; and they had the aim of discussing technological innovation, policies, and economic measures that could contribute to mitigate the global aviation impact to climate change, such as the adoption of low-carbon technologies. The authors explain that only 1% of the world population has flown yet and that there will be a great increasing rate of this percentage in the next years, which makes it very difficult to suppress the impact of aviation on climate change. Moreover, they suggest future research directions.

In Chapter 5, “*Diffusion and Adoption of Innovations for Sustainability*”, Muga and Thomas primarily investigate theory and concepts of sustainability and why they are important to innovation and vice-versa. They discuss in detail some key reductionist approaches to assessing sustainability such as Life Cycle Assessment (LCA), Life Cycle Cost Analysis (LCCA), and sustainability indicators and they also apply these approaches to an engineering infrastructure scenario. The authors explain “the integrated sustainability methods of LCA and LCCA enable a business to assess alternative products or processes at the planning and design stages. These methods may also be used during the production stages to assess whether a business needs to use a different raw material to make their products”. The chapter also contributes by explaining the roles of management, social network analysis, and mental models of individuals in the diffusion and adoption of innovations.

In Chapter 6, “*Social Innovation, Environmental Innovation, and Their Effect on Competitive Advantage and Firm Performance*”, Salvadó, Navas-López, and Castro provide special emphasis on the relationship between businesses and natural environment. They argue that the inclusion of environmental criteria into business activities can promote the creation of new core competencies, offering a creative and innovative perspective to the organization that can lead to the achievement of competitive advantages. In this investigation, the authors analyze the existence of a direct relationship between Environmental Innovation and Firm Performance and the existence of an indirect relationship between the two, which highlights the mediating role of the kind of competitive advantage generated. Among the chapter’s main findings: 1) the authors explain the nature of Environmental Innovation through the Social Innovation perspective and therefore they contribute by considering some key aspects of administrative and technological innovations that have not been taken into account in the academic literature; 2) they analyze the different types of environmental innovations in order to understand and describe the strategic options in the environmental field; 3) and they conclude that Environmental Innovation is related to business performance. Finally, they explain that the practical implications of this previous relation are of great importance, since it directly influence the choice of the type of environmental strategy, allowing the company to choose from innovative strategies (based on pollution prevention) or more conservative strategies (emissions control).

In Chapter 7, “*Observe, Conceive, Design, Implement and Operate: Innovation for Sustainability*”, Carvajal Díaz, Ramírez Cajiao, and Hernández Peñaloza present a learning model that can be applied by academics and professionals in the development of innovations. The model draws upon the engineering education cycle of Observe, Conceive, Design, Implement and Operate (OCDIO). The authors start their chapter by reviewing curricula and learning activities in some world-class universities in order to understand the contribution of state-of-the-art education models for the creation of competences for innovation. Afterwards, they introduce the Observe, Conceive, Design, Implement and Operate (OCDIO) model and explain that sustainability comes from following the OCDIO cycle continuously. In such a

proposal, the authors argue that the OCDIO model contributes for the sustainability of the innovation, but not specifically for the creation of solutions and promotion of innovations that subsume the three pillars of economic, social and environmental sustainability. Nevertheless, the OCDIO model as well as other learning cycles such as Problem-Based Learning (PBL) can be followed to reach innovations which attend such sustainability triple-constraints. Furthermore, the authors use the OCDIO framework to analyze innovations in Colombia as well as case studies in the Universidad de los Andes.

## Section 2 on Organizational Networks and Innovation Subsumes Six Chapters

In Chapter 8, “*The Integration of Independent Inventors in Open Innovation*”, Smeilus, Harris, and Pollard explain that “whilst current academic literature points to the growing importance of Open Innovation as a means of companies capturing new products from sources other than internal R&D facilities; the integration of independent inventors, a source of innovative new products, within Open Innovation has proven challenging”. The authors present a series of preliminary Critical Success Factors, driven by current academic literature, that are intended to contribute to independent inventors becoming more successful suppliers of new product ideas to businesses, with the intention that adherence to such factors may have a positive influence on the effectiveness of open innovation. The chapter also provides the necessary introduction and background to the understanding of the next chapter.

In Chapter 9, “*An Examination of Independent Inventor Integration in Open Innovation*”, Smeilus, Harris, and Pollard take the preliminary critical success factors proposed in the previous chapter and utilize them as priori constructs as evidence is sought through case study for their presence or non-presence in a practical context. A case study on the Caparo RightFuel, an automotive device originating from an independent inventor and commercialized through an Open Innovation model, forms the basis of the chapter.

In Chapter 10, “*Firm-Specific Factors and the Degree of Innovation Openness*”, Lazzarotti, Manzini, and Pellegrini investigate the topic of how open innovation is actually implemented by companies, according to a conceptual approach in which open and closed models of innovation represent the two extremes of a continuum of different openness degrees; whereas, these are not the only two possible models. By means of a survey conducted among Italian manufacturing companies, this chapter sheds light on the many different ways in which companies open their innovation processes. Four main models emerge from the empirical study and they are investigated in depth in order to understand the relationship between a set of firm-specific factors (such as size, R&D intensity, sector of activity, company organization) and the specific open innovation model adopted by a company.

In Chapter 11, “*Effects of Product Development Phases on Innovation Network Relationships*”, Öberg starts by explaining that “in the research literature, product development has frequently been associated with four distinct phases: introduction, growth, maturity, and decline. While these phases have been related to and used for the study of product life cycle, market strategies and competition, less or no attention has been given to the subject of Innovation Network Relationships (INRs), and more specifically, to whether and how INRs are affected by these Product Development Phases (PDPs)”. Based on a literature review of Resource Dependence Theory (RDT) and four case studies, this chapter contributes by discussing how various INRs are affected by PDPs of an innovative firm. Findings include: (i) the specific needs and resource dependence by the innovative firm during different PDPs affect the status of the firm’s INRs, whereas new relationships are built and old ones are finished; (ii) during product development, the INRs become increasingly complex where network parties become negative resources

of the innovative firm through increased uncertainty being introduced into previous relationships; and (iii) the development of INRs cannot be captured on a dyadic level, but various parties' relationships with one another need to be considered.

In Chapter 12, *"Maturity in Innovation Network Management"*, Van Rijnbach, de Boer Endo, and Leonardi aim to contribute to a better understanding of how innovation networks work and how to develop them. They start by reviewing the concept of network management and by explaining the principal attributes that impact the formation and optimization of innovation networks, based on the network's objectives, the combination of the characteristics of the network's participants as well as the network's organizational format to attract and maintain the partnership. To reach the chapter's aim, the authors present the results of a benchmark study undertaken in Brazil, the United States of America and Europe between March and June 2009. In this study, they interviewed executives at 24 leading companies known as innovators in their industry. Findings by the authors showed that some common good practices exist among companies when it comes to open innovation management. They concluded that, although some practices partly depend on the company's industry or Research, Development and Innovation (R&D&I) investment levels, many practices are common and their use depends on the company's level of maturity regarding open innovation networks. As a result of their investigation, the authors derive and propose a maturity model for open innovation, based on four dimensions: strategic, relational, support and organization.

In Chapter 13, *"Science Parks and their Role in the Innovation Process: A Literature Review for the Analysis of Science Parks as Catalysts of Organizational Networks"*, La Rovere and Melo investigate the contributions of Science Parks (SPs) to innovation. In particular, the authors discuss whether the literature on innovation and SPs considers the fact that SPs can be catalysts of Organizational Networks (ONs). The authors consider that ONs are elements of knowledge production and can contribute to the development of core competencies to pursue dynamic innovation and competitive advantage. The chapter is based on literature review of scientific papers and theses on SPs and their contributions to innovation, which are included in indexed databases. Preliminary analysis of the literature shows that SPs have been mostly studied as part of innovation systems, and that less attention has been given to the role of ONs and SPs in the processes of technological learning and innovation.

### Section 3 on Entrepreneurship and Innovation Subsumes Four Chapters

In Chapter 14, *"Entrepreneurial Learning and Innovation: Building Entrepreneurial Knowledge from Career Experience for the Creation of New Ventures"*, Gabrielsson and Politis explain that the relation between entrepreneurial learning and innovation has been poorly understood, especially with respect to how entrepreneurs build up their capability to create new ventures. In this chapter, the authors employ arguments from theories of experiential learning to examine the extent to which entrepreneurs' prior career experience is associated with entrepreneurial knowledge that can be productively used in the new venture creation process. They relate entrepreneurial knowledge to two distinct learning outcomes: the ability to (i) recognize new venture opportunities, and (ii) cope with liabilities of newness. Based on analysis of data from 291 Swedish entrepreneurs, they provide novel insights into how and why entrepreneurs differ in their experientially acquired abilities in different phases of the new venture creation process.

In Chapter 15, *"Innovation and Corporate Reputation: Britain's Most Admired Company surveys 1990-2009"*, Brown and Turner explain that The Britain's Most Admired Company surveys into cor-

porate reputation includes nine characteristics, one of these is a company's capacity to innovate. They also explain that, "surveys between 1990 and 2009 show that a good reputation for innovation does not guarantee a good overall reputation; nor does a reputation for innovation lead to business success. However, where a company has a reputation for innovation and is able to manage other characteristics, there is a better chance that this company will develop its innovation capability into long-term competitive advantage and profitability. Central to this conclusion is converting innovation into enhanced processes, products or services through effective implementation". The chapter also contributes by identifying key attributes of companies that combine a reputation for innovation, with a good corporate reputation overall and business success.

In Chapter 16, "*Natural Resource Dependency and Innovation in the GCC Countries*", Andersson explains that, "whether the current strong performance displayed by the Gulf Cooperation Council (GCC) countries proves sustainable for the long term will cast new light on the extent to which natural resource abundance can be turned into a blessing, rather than a curse, and then the requirements for that". Andersson's chapter synthesizes new evidence on the conditions for innovation in these economies, including through examination of innovative performances at firm level, collected through the first Community Innovation Survey (CIS) carried out in the GCC countries. Whereas strengths are recorded in some respects, e.g., Information and Communication Technology (ICT), education and some conditions for start-up activity, challenges remain in others, including with regard to governance. The chapter ends with recommendations what further action is required to enable better conditions for innovation both in the natural resource sector itself, and broadly in the economy.

In Chapter 17, "*Innovation in Scenario Building: Methodological Advancements and a Foresight Study of the Automotive Industry in Brazil*", Schneider, Seleme, Rodrigues, de Souza, and de Carvalho extend and apply a prospective scenario building methodology over a long-range forecasting (up to 2020) for the analysis of market and innovation potentials of the automotive industry of the Metropolitan Region of Curitiba (MRC); whereas the MRC is located in the state of Paraná in southern Brazil and is home to an automotive sector, which plays a major role in the local and national economy. The sources of data in the study include literature review, document analysis, direct observation, semi-structured interviews and two rounds of questionnaires. Results of the study provided the players, stakeholders and entrepreneurs with a clearer managerial view of the industry's future and also suggested that the proposed methodology can be applied to other industries in future studies.

## Section 4 on Knowledge Management and Innovation Subsumes Four Chapters

In Chapter 18, "*Toward a More Pragmatic Knowledge Management: Toyota's Experiences in Advancing Innovation*", Cavaleri contributes by examining how pragmatic principles used by Toyota can achieve superior innovation results. The chapter concludes by explaining why the pragmatic approach delivers superior performance at lower cost than conventional knowledge management methods.

In Chapter 19, "*Knowledge and the Politics of Innovation: Insights from a R&D Company*", Asimakou discusses the relationship between knowledge management and innovation; and specifically, she examines how knowledge in organizations affects the creation of new knowledge and what the implications are for innovation management. The chapter's core argument is that in a knowledge-based company, where competition is assessed at the edge of rare expertise and the development of innovations, knowledge, which is always interwoven with power, becomes a precious resource, on the grounds of which struggles are inevitably enacted over its control. To support such an argument, the chapter

discusses two innovation mechanisms in two business groups of a major oil company. The study uses a set of qualitative techniques for data collection (in-depth interview, participant observation, documentary analysis) and a sample of 41 employees that represent the groups participating in the innovation game (manager, scientists, assistant scientists, administration staff and students). From the results, the author concludes that two mainstream innovation management approaches (the rational planning and the cultural approach) have shaped the understanding and actions of the Business Groups in setting up the innovation mechanisms; however, power struggles at the individual, group and organizational level impacted upon the innovation processes to the extent that the latter became passive technical solutions.

In Chapter 20, *“Innovation and Knowledge Management for Sustainability: Theoretical Perspectives”*, Jorna and Faber explain that “innovation is a special case of knowledge management; it is about knowledge creation. With economic profit as its driving force, innovation is mostly short term and commercial, feeding the question whether innovation really can be applied to ecological and social systems. The problem concerns the goal of innovation: what does it suppose to realize?” From such constraints, the authors propose the study of a combination of Knowledge Management (KM) and innovation concepts with sustainability and they argue that as long as the emphasis in innovation is on ‘profit’ and not on ‘people’ and ‘planet’ (the three P’s of sustainability) there is no guiding mechanism for innovation, namely the existence of a sustainable future. They also explain that “in a sustainable perspective, innovation becomes an instrument that benefits society at large”. Based on these perspectives and literature review, the authors contribute along three lines of thinking: (i) by demonstrating that innovation is knowledge creation at an individual and collective level; (ii) by explaining that innovation should be a means and not a goal; (iii) and by offering a perspective to define the relationship between knowledge, innovation and sustainability. The authors conclude the chapter by introducing concepts on Knowledge of Sustainability (KoS) and Sustainability of Knowledge (SoK), and they set the outline of a framework for sustainable innovation.

In Chapter 21, *“Dynamic Capabilities and Innovation Radicalness: Review and Analysis”*, Cruz-González, Navas-López, López-Sáez, and Delgado-Verde provide theoretical analyses on the determinants of firm’s innovation radicalness (the degree of novelty incorporated in an innovation) from a dynamic capabilities-based view of competitive advantage. The authors start by reviewing the many literature facets and concepts of dynamic capabilities. From such a review, they argue that dynamic capabilities (or second order capabilities) arise from the firm’s orientation or ability for knowledge exploration that can result in the creation of new organizational capabilities (first order capabilities). By deepening on this exploratory learning argument, they also suggest that external knowledge acquisition and internal knowledge combination are key components of dynamic capabilities.

## Section 5 on R&D&T (Research, Development and Technology) Management and Innovation Subsumes Four Chapters

In Chapter 22, *“Research Profiles: Prolegomena to a New Perspective on Innovation Management”*, Jordan, Mote, and Hage explain that “despite the increasing importance of the management of research for innovation, the range of differences among types of research, as well as projects and programs, are not adequately captured in current theories of either project or organizational innovation”. In this chapter, the authors offer preliminary discussions for a new perspective about alternative styles of management for different types of research, whether basic, applied, product development, manufacturing, quality control or marketing. Based on these discussions, the chapter proposes a framework for a new perspec-

tive of innovation management, called Research Profiles, which is derived from a literature review and extensive field research. This new perspective delineates four research profiles on the basis of two dimensions of research objectives and two dimensions of research tasks. In matching the research objectives and tasks, the authors identify inherent dilemmas that managers must address and this developing perspective suggests appropriate some research management approaches.

In Chapter 23, “*Determinants and Consequences of R&D Strategy Selection*”, Filipescu and Cázares explain that “nowadays firms are not able to achieve all innovation in-house due to the specific set of technologies required by most products and processes, obliging firms to access external knowledge”. In this chapter, the authors contribute to the knowledge on firm innovating behavior by: (i) analyzing the determinants of the selection of the “Research and Development (R&D) Strategy” (all abbreviated by RDS), considering the make, buy and make-buy as the three RDS types; (ii) and also analyzing the consequences that each of the RDS types has on firm innovativeness. Results show that commercial and organizational resources, jointly with the information sources, influence the selection of the strategy. As for the second part of the analysis, the authors see that all RDS types have positive effects on firm innovative performance but these effects are not straightforward and simple since they vary depending on firm’s type and on the radicalness of the innovation.

In Chapter 24, “*Institutional Innovation Practices in Technopoles: An Example in France*”, Berthinier-Poncet, Bocquet, Brion, and Mothe contribute by filling a void in the literature on the question on whether organizational proximity can be fostered within clusters. With the objective to gain new insights into institutional practices and to evaluate their effects on firms’ innovation performance, the authors address a dimension that has received little attention until recently, which is named the local governance structures of technopoles. They explain that by identifying how geographical and organizational (cognitive and relational) proximity interrelate in the analysis of cluster forms, the chapter seeks to contribute to the burgeoning literature on the different types of proximity. For such a purpose, the authors performed an empirical research that was based on a representative sample of 88 firms implanted within the Savoie Technolac technopole, in the French Rhône-Alpes region. The results suggest that, even though local governance contributes to territorial anchoring, only the local labor market has a direct significant impact on the firms’ innovation performance. Additionally, it was found that territorial anchoring combined with the roles played by governance in terms of ‘*matchmaking*’ and support for technology transfer significantly increased the number of innovation projects. The authors emphasize that “these results suggest that governance has a decisive role in the creation of communication and interaction structures between firms, which are essential for firm innovation”; and that, “this research may have important implications for governance modes, not only in technopoles, but also more generally in clusters”.

In Chapter 25, “*Choosing Locations for Technology and Innovation Support Centers: Methodological Proposal and Brazilian Studies*”, Batalha, Santos, Alcântara, and Granemann discuss problem-solving issues of location of Technology and Innovation Support Centers (TISC) through multi-criteria analyses in order to identify demand and supply factors of these services. The authors use quantitative and qualitative methods to establish a sequence of steps that include a variety of aspects ranging from criteria preferences to global valuation of the model. Multi-criteria analysis is applied to the choice of geographic locations for Brazilian Technology Centers; this analysis contributes to identify the most suitable or preferable regions for the creation of technology centers as well as to reveal particular characteristics of the dynamics of such services in the regions in question.

## Section 6 on Marketing and Innovation Subsumes Four Chapters

In Chapter 26, “*Taxonomy of Marketing Core Competencies for Innovation*”, Viardot argues “there is a lack of taxonomy of the various marketing capabilities that are necessary to achieve the market success of innovation”. Therefore, the author tries to fill this gap by proposing a model that subsumes two classes of Marketing Core Competencies (MCC) for successful innovative companies. The first category of core competencies is related to a superior ability of the firm to identify and to connect the actual market needs with the innovation during the preparation of the new product launching phase. Once the innovation is on the market, a second group of core competencies is associated with the capacity of the firm to ease the customers’ tensions in order to facilitate the acceptance of the innovation and turn it into a market success through adoption and diffusion. In conclusion, the chapter underlines the importance of the place of these two categories of Marketing Core Competencies (MCC) in innovative firms.

In Chapter 27, “*Self Regulation on Innovative Products Choice*”, Prado, Lucena da Silva, and Korelo explore how choice goals influence consumers’ innovativeness in a product category domain. They explain that “intentions to adopt new products are guided by promotion and prevention self-regulation systems”. Therefore, in the investigation of the chapter, two of the choice goals were classified as promotion goals – justifiability and choice confidence – and two were classified as prevention goals – anticipated regret and evaluation costs. Two groups emerged from the analysis: one named “most innovative” and another called “less innovative”. The authors explain that “when comparing the groups, the results show that the most innovative cluster demonstrated higher choice confidence, higher justifiability and was more capable of avoiding a possible choice regret. The differences found in the group analysis highlight the need of understanding in further detail how consumers behave during the choice process of innovative products. Therefore, the Regulatory Focus Theory has been shown to be very important for understanding the choice process, especially for the innovation adoption”.

In Chapter 28, “*The New Product Development Process as a Communication Web – Part I: Introduction, Concepts and Spanish Context*”, Fernández, Varela, Bande and Valmaseda contribute with the existing literature by analyzing the innovation activities of Spanish companies and by proposing New Product Development (NPD) as a communication Web. Based on literature reviews, the authors propose a model that relates the external communication of cross-functional teams to the performance of NPD programs. The composition of NPD teams and the external communication activities form the core competencies for companies and they can provide them with major competitive advantages. The chapter also provides the necessary introduction and background to the understanding of next chapter.

In Chapter 29, “*The New Product Development Process as a Communication Web – Part II: Analysis of Spanish Firms*”, Fernández, Varela, Bande and Valmaseda extend the investigation in the previous chapter by applying structural equations analysis in order to compare the model to a sample of 136 managers from different functional areas at 121 innovative Spanish firms. The authors explain that “the results indicate that the impact of explanatory variables on new product programme performance differs according to the measure of performance considered. The cross-functional nature of NPD teams, the presence of product champions in NPD teams and the gathering of information by all NPD team members were all shown to positively influence new product performance. Firms should be aware of the importance of the aforementioned variables”.

## Section 7 on Finance and Innovation Subsumes Two Chapters

In Chapter 30, *“Innovations and Financing of SMEs - Part I: SME Financing and Credit Rationing [The Availability of Funds]”*, Walker and Scholz describe various financing options and give rationales for the credit rating process and credit conditions building the base for financing decisions. Furthermore, by discussing the topic of ‘Credit Rationing’, the authors demonstrate the impact of credit conditions on management decisions in order to justify the rationing of credits. This chapter also provides the necessary introduction and background to the understanding of next chapter.

In Chapter 31, *“Innovations and Financing of SMEs - Part II: Case Study of German SMEs in 2010”*, Walker and Scholz describe traditional and non-traditional financing opportunities for SMEs in Germany by focusing on its applicability. They explain that “the disclosure of financial business information and giving a say to an equity financier is a difficult topic for owners of Small and Medium-sized Enterprises (SMEs), because these companies are often run as a ‘one-man-show’ (by a single manager) and this person identifies itself with the company. The request for external funds is in that perspective still regarded as a disability of a business to be self-financed. A comparison of the organizational structure of a SME and that of a Large Scale Enterprise (LSE) reveals the structural weaknesses in terms of research and development (R&D) activities. While LSE have an extra department, budget and procedures to develop product and process innovations similarly to a knowledge push, in SMEs, innovations are often originated from customers - similarly to a need pull process. Furthermore, CEOs and customer contribute to a great extend to innovations in SMEs (BDI, 2010). The results of an online-based survey presented in the BDI-Mittelstandspanel 2010, show that less than 13% of innovations are originated by external scientists, R&D organizations and consultants. This proves that external R&D sources (to compensate missing internal resources and structures) are rarely employed; impeding or slowing down the development of innovations”.

## Section 8 on Internationalization and Innovation Subsumes Two Chapters

In Chapter 32, *“The Recent Internationalization of Brazilian Companies”*, Arbix and Caseiro explain that “the recent wave of internationalization among Brazilian companies differs from past experiences, in terms of volume, reach, destination and quality. Brazilian multinationals are not restricting their activities solely to regional markets, nor are their first steps entirely directed towards South America. In amount of investment and number of subsidiaries there are signs they prefer assets and activities in advanced markets – including Europe and North America - where they compete on an equal footing with major conglomerates for a share of these markets. Some Brazilian companies have previous internationalization experience, and a significant portion had been prepared and initiated outward growth in the 1990s, after the economy opened up. However, the boom of internationalization that began in 2004 took place in such unusual conditions as to deserve highlight and special analysis”. The authors contribute by discussing the recent expansion of Brazilian multinationals as a result of: (i) the functioning of a more responsive and targeted system of financing, (ii) transformation of the Brazilian productive structure, which led to the emergence of a group of companies seeking internationalization as a strategy, (iii) preference for seeking more advanced economies as a means to expand access to new markets and suppliers, as well as to absorb innovations and technology, (iv) the State’s performance in several dimensions, especially in financing the implementation of policies that support the creation of large national groups with a presence in the globalized market.

In Chapter 33, “*R&D Internationalization as Mechanism of Innovation in Global Enterprises: A Brazilian Case Study*”, Galina explains that “internationalization of Research and Development (R&D) allows transnational companies (TNC) to access different and important resources overseas, which may lead to the improvement of their technological innovation. The literature in this field was mostly created from studies of TNCs coming from developed countries”. In this chapter, Galina contributes by presenting some of the main topics the literature addresses on R&D internationalization, and which are used to explore and to verify how companies in developing countries internationalize their R&D activities. In order to do so, the author conducted a bibliographic review about strategies of internationalization of TNC operations, as well as motivating factors and management of R&D internationalization. The chapter finishes presenting a case study about international R&D conducted in a Brazilian TNC. The results enabled to evidence that, like developed countries TNCs, developing countries companies also seem to perform internationalization of R&D activities with very similar characteristics.

## Section 9 on Information Systems and Innovation Subsumes Two Chapters

In Chapter 34, “*Tools That Drive Innovation: The Role of Information Systems in Innovative Organizations*”, Caudill examines computer technology as a tool to support innovation and innovative processes. The author explains that the primary problem addressed in the chapter is the multitude of widely held misconceptions that seem to exist regarding technology and innovation; whereas technology is not innovative in and of itself. The chapter contributes by examining how technology is being successfully integrated into innovative processes in industry through literature review and case study methods. Specifically, this chapter focuses on the role of technology in communication and creativity, two of the many activities found in an innovative process. Findings indicate that while directly connecting technology use to innovation is difficult, technology can play a substantial role in facilitating the innovative process. Thus, the author concludes that “technology is a qualifier for many innovative processes, a resource that is necessary for the work of innovation to take place”.

In Chapter 35, “*The Roles of Cognitive Machines in Customer-Centric Organizations: Towards Innovations in Computational Organizational Management Networks*”, Nobre proposes innovative features of future industrial organizations in order to provide them with the capabilities to manage high levels of environmental complexity in the 21st century. For such a purpose the author introduces the concept of Computational Organization Management Networks (COMN), which represents new organizations whose principles of operation are based on the concepts of Hierarchic Cognitive Systems (HCS) along with those of Telecommunications Management Networks (TMN). Structured with functional layers and cognitive roles that range from technical and managerial to institutional levels of analysis, and also equipped with operational, managerial and strategic processes, the concept of Computational Organization Management Networks (COMN) plays an important part in the developments of future organizations where cognitive machines and Cognitive Information Systems (CIS) are prominent actors of governance, automation and control of the whole enterprise. It is in such a context that the new organization COMN will provide customers and the whole environment with innovations such as *immersiveness* for the production of services and goods that are most customer-centric.

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## ENDNOTES

- <sup>i</sup> Just as capitalism replaced feudalism, Marx and Engels believed socialism would, in its turn, replace capitalism, and lead to a stateless, classless society called pure communism (Baird, 2010).
- <sup>ii</sup> Consider for instance the expansion of Europe between the 15<sup>th</sup> and 18<sup>th</sup> centuries, which was empowered by the dominance of the colonizers in navigation and army technologies. Their overseas discoveries and actions brought about a revolution in the history of humanity, resulting in good, but also negative and controversial results of political, economic, religious, and social facets for the new world (Delouche, 2001; Ribeiro, 1970, 2000).
- <sup>iii</sup> Resources can be associated with tangible and intangible assets that contribute to the production system in the organization (Hitt, Ireland & Hoskisson, 2008). This book expands this definition to the perspective that resources are organizational elements that involve social structure, goals, technology and participants (Scott, 1998: 17-22). These resources can be employed at the technical, managerial, institutional and worldwide levels (Nobre, Tobias & Walker, 2009: 47-49) by the organization through the use of the organizational abilities for the development of the core competencies, and, consequently, for the creation of dynamic innovation and sustenance of the

organization's development. In such a perspective, the organization manages its resources with basis on its strategy. Moreover, the organization interacts with the environment for the acquisition, processing, creation, distribution, employment and management of new strategic resources.

- iv Cognition, intelligence, autonomy, learning and knowledge management represent the set of organizational abilities (Nobre, Tobias & Walker, 2010). These abilities have an important role in the deployment and management of the organization's strategic resources and they also represent sources of development of the organization's core competencies (Nobre & Walker, 2011); whereas this perspective is based on the strategic context of the resource-based view (Wernerfelt, 1995) along with dynamic capabilities of the firm (Teece, 2007; Teece, Pisano & Shuen, 1997).
- v Sustainability means the ability to meet the needs of the present without compromising the ability of future generations to meet their needs (WCED, 1987).