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Narratives, calculation and market exploration

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What Do Business Models Do? Narratives, Calculation and Market Exploration

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Abstract

Building on three case studies of new ventures, we examine the role played by business models in the entrepreneurial process. Unlike debates on the usefulness or realism of business models, we adopt a pragmatic approach and consider their materiality, use and dynamics. Taking into account the variety of its forms, which range from corporate presentations to business plans, we show that the business model is a device that performs both a narrative and a calculation and that allows the entrepreneur to explore a market by gradually constructing a network. These specific features explain the pervasiveness of business models in entrepreneurship.

Keywords: Business model, market exploration, technology commercialization, entrepreneurship

Introduction¹

Innovation takes its practitioners and students beyond the boundaries of organizations. It is increasingly “open” (Chesbrough, 2003) in the sense that it involves various actors who contribute to the funding, generation and commercialization of innovations and who are not coordinated in the hierarchy of a single firm. In high-tech industries, such as biotechnology or

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software, the very locus of innovation moves from individual firms to networks (Powell et al. 1996). These networks are “technico-economic” (Callon, 1991) for they are composed of heterogeneous actors: big firms, but also entrepreneurs, universities, customers, investors, regulators... and the intermediaries that circulate between them. The distribution of innovation across different actors calls for new modes of coordination and management devices. Methods for the management of innovation within the individual firm, such as project management (Clark and Fujimoto, 1991) or portfolio matrices (Mikkola, 2001), can hardly be transposed to the practice of collective innovation which is marked by a high degree of uncertainty in the objectives and the nature of the activities carried out, but also in the identity of the actors involved. New modes of organization are crafted and implemented, such as platforms (Robinson et al, 2005). What these devices are and how they allow managing the tensions inherent in collective innovation are crucial, yet under-researched, issues. In this paper, we focus on a specific device that is pervasive in entrepreneurship and that, we contend, embodies and fits the uncertain and distributed nature of innovation: the business model.

Business models are strange entities. On the one hand, at least since the dotcom explosion and subsequent burst in the 2000s, business models populate the economic world in a rather expansive manner. On the other hand, there is growing skepticism about them being sound depictions of enterprise perspectives. Are they operational tools that rationally inform investment decisions in a judicious way? Or are they rather rituals that may just fulfill, at best, some symbolic function but that lack a genuine economic meaning? What kind of stuff are they? What purpose do they serve, if any? These and similar questions about the use, meaning and rationale of business models have been raised in the management literature in recent decades (Baker et al., 1993, Honig and Karlsson, 2004, Magretta, 2002). For instance, in an influential article Porter (2001: 73) criticized the fuzziness of the business model that he defined as “an invitation for faulty thinking and self-delusion” to blame for the failure of many e-businesses. The dotcom bubble and its aftermath did somehow put an end to the interest of management scholars in the business model as a management tool but did not halt its use by practitioners. The business model proliferates in daily practices, especially in technology entrepreneurship (Chesbrough and Rosenbloom, 2002, Delmar and Shane 2003, 2004), while scholars, such as Porter, harshly criticize it. Puzzlement may come here from the fact that, while cogent analysis from management science tends to debunk the business model’s calculative power, investors and entrepreneurs may still consider it as a key ingredient of their economic endeavors.

This perplexity resembles, to some extent, to the one generated by other types of economic communicative devices such as financial analysts' reports. In their sociological study of financial analysis, Beunza and Garud (2007) identify indeed a similar opposition between two extreme interpretations, one that will consider analysts' reports as unbiased objective accounts of the financial performance of a firm, and one that will demystify analysts' objectivity and point rather to their role in social mechanisms of collective belief and influence. Against this simplistic binary alternative, Beunza and Garud (2007) develop an interesting sociological alternative. According to these authors, financial analysts serve the purpose of economic calculation, but not in a linear, straightforward manner. What analysts' reports provide are rather calculative frames: elements of commensurability and comparability that frame the field of references upon which investors may draw. This point of view allows analyzing the analyst's report as "market device" (Callon, Millo and Muniesa, 2007), i.e. as a market-enabling instrument that operates empirically for the enhancement of socially-situated practices of calculation and decision-making².

In this article, we adopt a similar approach to the study of business models. Business models may appear torn between usefulness and uselessness because of a failure in the way we may account for their use and operations. What do business models really do? In order to make sense of this question, we chose to depart from a scholarly vision that would consider such artifacts as transparent vehicles of the representation and appraisal of the expectations engendered by an entrepreneurial project. Symmetrically, we avoid considering their widespread empirical use as the symptom of a collective preference for opaqueness. Instead, we examine business models as intelligent collective devices in a context of uncertainty. We draw here on a set of diverse research trends within the social sciences that are of use in tackling such topic. We bring together the insights of the literature on the open or networked nature of innovation (e.g. Chesbrough, 2003; Powell et al. 1996), on distributed agency in entrepreneurship (Garud and Karnoe, 2003) and on the role of material devices in the construction of markets (Callon et al. 2007) in order to shed new light on the use and action of business models.

² Other market devices suffering from a similar twofold reputation, such as the written outcomes of market research, can be analysed in a similar vein (Gaglio, 2007): hardly taken into account as straightforward input by the company commissioning market research, market research results, often circulating in the form of PowerPoint presentations, serve nonetheless some vital purposes such as the demarcation of strong internal positions within the company.

Our main argument is that the business model works as both a calculative and a narrative device. Its function cannot be summed up to a reflexive exercise enhancing the rationality of the entrepreneur who is writing a PowerPoint presentation of the business model of the new venture or a business plan for it. The narrative and the calculation that it performs are addressed to a third party – a customer, an investor – and they are also partly designed by a third party – the investors themselves, but also consultancy companies and training institutions that tend to unify the notion of a business model and to standardize its content. We consider the business model in motion and follow its circulation between the entrepreneur and her partners, which leads to the evolution and gradual stabilization (which may result in failure or success) of the network composed of the technology, the customers, the investors and the entrepreneur, that the business model sketches and endeavors to build and hold together.

Through three case studies of academics spin-offs, which are ventures based on the formal or informal transfer of technology or knowledge generated by public research organizations, we explore the role of the business model that we consider as an inherent part of the equipment of technology entrepreneurs. We combine interviews with the founders and partners of these three spin-offs, internal corporate documents and presentations available on the Internet and in the press in order to identify the specificities of the business model as a market device that, we argue, enable the management of the tensions inherent to the entrepreneurial processes. In the first two sections of this paper, we review the literature on which we build and we present our methodology. One of the main challenges when studying the business model consists in identifying it in the various documents and discourses produced by the entrepreneurial venture. Therefore we devote the third section of this paper to this issue and put forward a tension between multiplicity and unity in which the business model is caught: multiplicity is required in the sense that entrepreneurs need to communicate with various actors, but unity is a prerequisite to reach an agreement among these actors. The various forms of the business model vary according to their audience, to their level of detail but also, and here seems to lie the main difference between the business model and its most studied form – the business plan, to the room reserved to words vs. numbers. This leads us to characterizing the business model as a narrative and a calculative device in the two following sections. Finally, we consider the business model in a dynamic perspective and through the lens of the entrepreneurial collective which, as we attempt to show, the business model puts to the test through a dual process of framing and overflowing.

Literature review

Open innovation and entrepreneurship: a variety of actors

The links between technology, science and economy have been deeply researched under the topic of innovation. Innovation implies the successful commercialization of new ideas. In his seminal work, Schumpeter (1934) described innovation as a process undertaken by the individual entrepreneur. In his second master piece (1942), Schumpeter totally relocated the locus of innovation shifting from the individual entrepreneur to the big firm. According to him, only big organizations own the necessary amount of resources to innovate. Research on innovation has mainly discussed the process of innovation in large firms without questioning the locus of innovation. First, in the 1950's, the process undertaken by big corporations was described as linear with four successive stages: research (science), development, manufacturing and marketing. In the 1970's, an interactive model of innovation was developed focusing on the two-way exchanges between research institutions and firms. In this stream of research, Kline and Rosenberg (1986) criticized the absence of retroactions in the linear process of innovation and developed a chain-link model with loops between the stages of the innovation process.

In the 1990's, the literature on innovation increasingly focused on networks, both as an empirical phenomenon to be described and analyzed and as a key construct in the study of innovation. Sociologists of science addressed the multiple interactions between science and technology on the one hand and the economy on the other hand by focusing on the set of actors involved in them. For instance, Callon (1991: 133) described the "techno-economic network" as "a coordinated set of heterogeneous actors which interact more or less successfully to develop, produce, distribute and diffuse methods for generating goods and services". According to Powell et al (1996: 116), "when the knowledge base of an industry is both complex and expanding and the sources of expertise are widely dispersed, the locus of innovation will be found in networks of learning, rather than in individual firms". Chesbrough (2003) captured this new mode of organizing in the notion of "open innovation". In the "closed innovation" model, the process of innovation was fully integrated and undertaken in big corporations. On the contrary, Chesbrough identified the emergence of new actors who contribute to three main activities involved in the open innovation model: the funding, the generation and the commercialization of innovation.

In the “open innovation” model, the entrepreneur becomes again a central figure in the process of innovation besides other actors including big firms. While the literature on entrepreneurship that draws on Schumpeter’s seminal work focuses on the individual (Gartner, 1988), recent research suggests that technology entrepreneurship is a larger process that implies many actors (Garud and Karnoe, 2001; Karnoe, 1991; Van de Ven et al., 1999). Entrepreneurial agency is distributed across actors (Garud and Kotha, 1994; Girard and Stark, 2002; Tsoukas, 1996). Some researchers have studied entrepreneurial networks (e.g. Birley, 1985; Butler and Hansen, 1991; Donckels and Lambrecht, 1995; Powell et al, 1996). Technology entrepreneurship implies three different activities - the funding, generation and commercialization of innovation – which engage the commitment of various actors in the venture creation project.

As one specific type of high-tech venture, research-based spin-offs (RBSOs) have been the object of a growing interest from policy makers and academics since they aim at creating wealth from publicly funded research by incorporating new knowledge stemming from science in marketable technologies, products and services (Mustar et al., 2006). They have become an important aspect of the technology transfer process and question the link between science and economy in a specific way. RBSOs address specific issues related to the non commercial environment from which they emanate. A debate has grown among researchers regarding whether and how these ventures create wealth and tackle problems such as the lack of resources. RBSOs face difficulties in establishing market presence, like most new technology based firms, but in addition they experience a lack of commercial resources due to their non commercial origin. Several types of resources - human, social or financial - critical to academic entrepreneurship have been identified (Mustar, 1997; Shane and Stuart, 2002; Wright et al., 2004a, 2004b). The financial gap, which is the lack of financial resources from which RBSOs may suffer, appears as a major constraint to the development of these firms and hence external money providers such as venture capitalists have been endowed with a crucial role in the construction of the resource base of RBSOs. Social resources, defined by Brush et al. (2001) as the industry and financial contacts of a company, are also key to the development of new ventures for they may facilitate accessing necessary resources.

Resource-based analyses of RBSOs point up the crucial role of venture capital firms in the entrepreneurial process. This issue has been further investigated by several scholars. Shane and Cable (2000) show how social ties influence the process through which entrepreneurs overcome information asymmetry between themselves and potential investors in order to obtain financing. Eckhardt et al. (2006) study the selection process of new ventures

by venture capitalists with the objective to explain why some entrepreneurs are more likely to gain access to capital from external sources.

From business plans as (un)useful tools to business models as market devices

If the literature drawing on the open innovation model has made a significant contribution to the study of entrepreneurship and innovation by extending the scope of analysis beyond the individual and thus taking into account the variety of actors involved, these studies still reserve agency for individuals and firms without examining the artifacts that circulate in the networks of innovation and the devices that are used by entrepreneurs and others. The business model is one such tool. It has not been investigated as an artefact commonly used by the actors involved in technology entrepreneurship, with the exception of one of its forms: the business plan.

Karlsson and Honig (2007) state the widely spread use of business plans among new businesses, and the lack of research on them. The authors aim at filling this gap by questioning the usefulness of this tool. They identify a loose coupling between the initial business plan and the current situation in the firm five years later. Without describing or screening the device in greater details, they assign a monitoring role to the business plan and evaluate its efficiency in this matter. In another article, these authors also investigate the institutional forces leading entrepreneurs to write a business plan and identify no positive correlation between this exercise and firm performance on a two-year period (Honig and Karlsson, 2004). On the contrary, Baker et al. (1993) justify the usefulness of business planning in high-growth small ventures and contend that written business plans are used more for internal management purposes than for start-up funding. They find that the business plan writing exercise is positively linked with higher profitability. Delmar and Shane (2003) provide a theoretical grounding to the usefulness of business planning for the entrepreneur. They argue that “by helping firm founders to make decisions, to balance resource supply and demand, and to turn abstract goals into concrete operational steps, business planning reduces the likelihood of venture disbanding and accelerates product development and venture organizing activity” (p. 1165). In another paper, the authors draw on institutional theory to explore the legitimization role of business plans which leads to a decrease in the hazard of disbanding for new ventures (Delmar and Shane, 2004).

These studies focus on one aspect of the business model, namely the business plan. Writing a business plan is considered either as a reflexive activity, including a subjective

process of self-consciousness inquiry by the entrepreneur, or as a means for legitimizing used by the entrepreneur in order to render the new venture reliable for investors. Moreover, the usefulness of the business plan is evaluated in regard to the performance of the firm as measured by its profitability or its survival.

In this paper, we adopt a different approach to business models. We draw on the literature in economic sociology and science and technology studies which takes into account the material and relational aspects of technological and economic settings. This approach is rooted in the seminal work of Michel Callon (1986) and Bruno Latour (1987, 1988) that brought non-human entities into the scope of sociological analysis by considering their material features and demonstrating their agency in the heterogeneous scientific and technological networks of which they are part. In addition to the proliferating research in science and technology studies to which it has given rise, this research stream echoes to research in the field of sociology and cognition that shares a trend towards the “decentering of the human subject” (Pickering, 1993: 561) and the distribution of action (Hutchins, 1995) to heterogeneous actors the list of which is not limited to humans.

This approach has been extended to the study of economy and markets (Callon, 1998). Markets imply “calculative agencies” (Callon, 1998: 3), the emergence of which cannot be understood by resorting to solely cognitive or institutional explanations. The source of calculativeness, Callon argues, lies in the networks of which these agencies are part, or, in a more radical manner, in the networks that constitute their action. These networks are not only made of people, as the notion of social network may induce, but also of tools and instruments. Of particular interest are the intermediaries (Callon et al., 1997) that circulate in the techno-economic networks, be they support materials, written documents, people or money. This perspective puts emphasis on the relations between people and the instruments that they use as well as on the interactions between human agents as mediated by the material entities that they put into circulation.

Scholars have analyzed the objects that intervene in the everyday action of economic agents by designating them, for instance, under the name of “management tools” (Moison, 1997), “mediating instruments” (Miller and O’Leary 2007), or “market devices” (Callon et al., 2007). The notion of market devices refers to “the material and discursive assemblages that intervene in the construction of markets” (Callon et al., 2007: 2) and covers a wide variety of objects in a set of market arenas that range from financial markets through distribution to accounting. The analyses of these diverse objects have in common the attention to their materiality and to their agency. By describing what these devices are and by asking

what they do, scholars have moved away from an instrumental or functionalist view and have envisaged people and the tools they use as performing a collective action. The case of double-entry book keeping analyzed by Callon and Muniesa (2005) illustrates this approach. Criticizing interpretations that instrumentalize either the tool (by analyzing double-entry book keeping as an efficient tool in the hands of a strategic agent) or the agent (by viewing this accounting technique as imposing coherence on agents), the authors argue that “it is the twosome consisting of the entrepreneur and double-entry book-keeping that conceives of this calculation and performs it” (Callon and Muniesa, 2005: 1237).

In a similar vein, Beunza and Stark (2004) demonstrate that the practice of arbitrage in financial markets involves a calculation that is distributed across the different desks of a trading room, the various tools, such as screens and computer programmes, with which arbitrageurs continuously interact, and the arbitrageurs themselves. Comparing the tools of traders with the instruments that scientists use in their laboratories, the authors show that they both reveal phenomena or opportunities that isolated human agents could not have discovered alone. The world of finance has proved to be a fruitful field for the study of market devices such as the reports provided by securities analysts (Beunza and Garud, 2007), the stock ticker (Preda, 2006), financial formulae (MacKenzie and Millo, 2003).

In the field of accounting, Miller and O’Leary (2007) focus on the role of two instruments – “Moore’s law” and “technology roadmaps” – in the microprocessor industry. By examining how these instruments act on the capital budgeting decisions of firms, the authors show that they mediate between science and the economy and coordinate the action of firms involved in semiconductors and related markets. The “Moore’s law” is a model that links the complexity and functionality of integrated circuits with their cost. Miller and O’Leary recount the development of the Moore’s law and its gradual transformation from prediction to industry norm. The authors’ comprehensive analysis allows an understanding of models as instruments for both representing and intervening (Hacking, 1983). The capacity of the model to circulate depends on its material features (Moore’s law was expressed in graphs) and on its translation into related instruments (here, the chart of the technology roadmap for semiconductors) that enact the model by guiding and coordinating action. Moore’s law and technology roadmaps mediate between actors (e.g. the manufacturers of semiconductors and the manufacturers of inputs for semiconductors), seemingly distinct imperatives (technological innovation and cost reduction) and domains (science and the economy) and thus they contribute to the making of markets. The analyses presented above particularly echo to the business model in so far as they emphasize the role of devices in the recognition of

opportunities (Beunza and Stark, 2004), which lies in the heart of entrepreneurship (Shane and Venkataraman, 2000), and the interplay between models and the tools that translate them (Miller and O’Leary, 2007). In this paper, we consider the variety of the forms of the business model: the business model as such (like formulae in finance or Moore’s law in the semiconductors industry), but also all the intermediaries in which it is embedded (like screens in trading rooms or charts in the technology roadmap for semi-conductors), among which the business plan figures prominently. We analyse business models as market devices that are part of the heterogeneous networks built by technology entrepreneurs. Our stance is distinctive in so far as we consider the material aspects of business models – the narrative and calculative bits that they contain – which we relate to their capacity to circulate within, and participate to the construction of, entrepreneurial networks.

Methodology

This paper utilizes a detailed field study of three RBSOs. The research design employed an inductive approach to provide meaningful insights of the role of the business model as a device for the commercialization of a technology. Drawing on the literature about case study research and qualitative methods (Eisenhardt, 1989; Glaser and Strauss, 1967; Miles and Huberman, 1984; Yin, 1981, 1984), we built our research strategy to provide a description (Gersick, 1988) of business models and to generate theoretical proposals regarding their roles in innovation processes implying distributed agency.

Our approach is exploratory in so far as the business model has no theoretical grounding in the literature and its materiality and use by the actors of innovation has not been studied. The broadness of the initial research question led us, as a first step of our research process, to meeting twenty founders or CEOs of French RBSOs from diverse sectors in order to get first insights on their business models and the role that they play in the development of their ventures. We choose to focus on academic spin-offs because the commercialization of a technology through the creation of a venture emanating from a non-commercial environment constitutes a polar-type. We argue that their lack of commercial resources exacerbates the role of the business model as a vehicle for bringing a technology on a market.

The venture is the first unit of analysis. A small questionnaire drawn on the scarce literature on business models was administered to the twenty entrepreneurs. The firms inquired were created between 1995 and 2002. We decided to restrict our sample to RBSOs that are less than twelve years old, because the start-up phase of a firm is traditionally defined

as the first twelve years of existence, and more than five years old, in order to gain insights on the evolution of the business model on a longer period. The questionnaire included questions relating to the commercial orientation of the venture (selling either technology or products-services), the main revenue sources at start-up and at present time, the level of standardization of the offerings, the position of the venture in the value chain (Porter, 1980). In addition to this very simple questionnaire, the two authors conducted an open-ended interview about the process of choice of the business model and its evolution along the development of the venture. Through these stories, the interviewees confirmed our first intuition about the collective nature of the process leading to the choice of a business model. This led us to expanding the unit of analysis to the extended network around the organization, namely the venture and all the entities participating to the commercialization of its technology, mainly its investors and customers. The interviewees were asked to draw a list of these partners and stakeholders and to provide contact information. During this first step of the research, we also identified the fast evolution of the business model in the very infancy of the firm. Therefore we included younger ventures in the seed stage in our selection of cases, which also allowed us to avoid bias related to retrospective data.

In a second step, we chose three RBSOs³ for case study analysis. Following Eisenhardt (1989), the three cases were selected to contain a substantial degree of variety along traditional criteria such as sector of activity, age, technological area but also along factors of heterogeneity among RBSOs (Mustar et al, 2006) such as resource configuration at start-up (equity funding vs. no external capital, intellectual property), institutional link (formal and informal technology transfer, academic founder vs. surrogate entrepreneur) and activity (type of output).

The first spin-off case study centers on a spin-off, that we will call Acoustech here, that comes from the University of Technology of Compiègne (France) and specializes in non destructive testing services by acoustic emission applied to materials and structures. It was created in 2002 by a researcher to exploit commercially the technology developed during his PhD, mainly his know-how. Acoustech sells services based upon this unpatented proprietary technology. Its activity is divided in two main offerings. First, non destructive testing services by acoustic emission allow testing industrial plants or equipments. Second, the company provides testing solutions to customers who need to characterize new materials. The Research & Development program centers on on-board systems able to detect failures. Acoustech

³ For confidentiality purposes, the spin-offs, their customers, partners and products have been renamed.

raised little external capital, hence it relies mainly on the revenues that it generates. A regional venture capital fund invested 10 000 € in 2002 in exchange of 16% of the capital. In addition, people from the parent research organization brought funds at founding. The majority of the capital (77%) is held by the managers of the firm. Acoustech employs seven employees. It has several scientific collaborations with public research organizations either through R&D agreements or in publicly funded research programs. It has also engaged in a commercial partnership with the non-destructive testing department of a major electric engineering company in which the spin-off provides its competences in acoustic testing in joint projects for customers.

The second company studied in the paper is Koala. Koala is a spin-off from INRIA⁴ and Ecole des Mines de Paris⁵ founded in July 2006 by a senior researcher and a PhD student. The venture is in the seed stage and tries to get external funding and first customers. The initial technology, which consists in an algorithm that allows processing data coming from vehicles in order to calculate travel times, was developed during a European research project. The founders have an exclusive two-year license of the technology that is owned by the INRIA. Several business models have been envisaged such as software editor or research services provider. Koala does not have any customers yet and works mainly on technology development with the idea to file two patents soon while choosing the business model of the venture. Moreover, Koala is the leader of a European project that focuses on the possible ways to influence drivers' itineraries using information about the traffic. Koala is incubated in the biggest French incubator and was awarded a prize in the National contest of innovative venture creation⁶ organized by the French agency for Innovation (Oseo-Anvar⁷). Koala employs five people in technical activities and two interns.

⁴ INRIA : the French national institute for research in computer science and control.

⁵ The Ecole des Mines de Paris is an engineering school.

⁶ The national contest aims at selecting and promoting project of innovative ventures creation through financial funding and specific support. In the category "Emergence", the entrepreneurs submit a project that needs technical, legal and economic maturation. They can be awarded funding up to 45 000€ In the category "Creation and Development", financial funding up to 450 000€ are provided to the award winners just before the creation of the venture when the project is mature.

⁷ OSEO was born in 2005, by bringing together ANVAR (French innovation agency) which had been organizing this contest since 2000 and BDPME (SME development bank). Its mission is to provide assistance and financial support to French SMEs and VSEs in the most decisive phases of their life cycle: start up, innovation, development, business transfer / buy out.

The third case study examines Virtual Video Plant (VVP), a spin-off from the University of Technology of Compiegne that was created in 2003 to commercialize the technological results of a research program that had started in 1995. The project led to the development of software solutions enabling the self-production of audiovisual contents by non professionals. The technology of production of hypermedia content was patented and was sold to the venture by the parent organization. In 2002 a surrogate entrepreneur (i.e. an entrepreneur who does not belong to the research team) was hired to prepare the spin-off process. At founding, VVP aimed at selling software licenses in the sectors of tourism and learning. Since start-up, VVP has developed several products to build a software platform assembling the offerings of the firm. Progressively, VVP reoriented its activity towards new markets, mainly the media market. It does not sell software licenses anymore; instead it charges set-up fees and forfeiting according to the number of video clips produced with its software platform. VVP also sells professional services, for example for the use of its technology in advertising campaigns. VVP won the National contest organized by Oseo-Anvar in the category “emergence” but failed in the next category “creation”. In 2006, VVP raised funding from a business angel and a venture capital fund. It employs sixteen people. In 2007, VVP’s sales reached 1 million \$ and their annual growth is 50%. VVP has opened two offices in the United Kingdom and Brazil.

In each case, we combined data collection methods in order to triangulate the data gathered. The two authors led two-hour open-ended interviews with the founder or the CEO of the firm, in which the description and the evolution of the business model were discussed. The presence of two interviewers allowed the triangulation of investigators (Pettigrew, 1988⁸). In addition, we collected a large amount of internal corporate documents such as business plans, applications for the national contest of innovative venture creation, executive summaries. We also searched for publicly available documents and information on the websites of the spin-offs, press releases, articles and interviews. This collection of data enabled us to overcome the bias introduced by using retrospective data, to gain access to the materiality of the business model and to make comparisons according to the audience of each document. Interviews were also led with the spin-offs’ partners identified during the interviews with the founders. For example, the spin-offs’ customers were asked about their perceived value of the offerings of the venture, their evaluation of the business model, their

⁸ A. Pettigrew, 1988, Longitudinal Field research on Change: Theory and Practice, Paper presented at the National science Foundation Conference on Longitudinal Research Methods in Organisations, Austin.

role in the building and evolution of the offerings, their influence on the strategic orientation of the firm (targeted markets, exit strategy). We also questioned the partners about the encounters during which the business model of the venture was presented.

Multiplicity and unity in the business model

Towards a definition of the business model

"Set-up fees (...) + Clip packages (...) + Professional services". "[Jboss] offers a subscription to support and services 24/7 to big firms using the software". "Kelkoo has 400 customers in Europe which are the main commercial web sites but also brands that want to promote their products on the Internet. We are paid by them according to the number of visits generated on each web site."⁹ What do these statements have in common? They all describe a business model. Along those descriptions, the business model appears in various contexts and seems to refer to very different entities. It is difficult to extract a coherent definition of a business model from these documents. Indeed, this multiplicity of occurrences creates a blurry vision of what a business model is, which has led many scholars to criticize it.

If we take a look at the scarce literature on business models, our vision of the business model does not get clearer. In most academic contributions, the role of the business model appears to consist in providing answers to very diverse questions such as: "How do we make money in this business?", "Who is the customer?", "What does [the customer] value?", "What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?" (Magretta, 2002: 4), "How do you get paid?" (Chesbrough and Rosenbloom, 2002: 533), "How do we get and keep customers?" (Linder and Cantrell, 2000: 5), "In what markets does the firm compete?", "What are its key processes?" (Lucas, 2002: 29). Beyond the variety of these questions, the concept of value is at the heart of all definitions found in the academic literature. As Linder and Cantrell (2000: 1) put it, "A business model, strictly speaking, is the organization's core logic for creating value".

This key concept is declined in several dimensions but gives coherence to the business model. Three main aspects of the business model can be identified in the literature. First, the

⁹ The citations are taken from the following sources: PowerPoint presentation of the software editor Virtual Video Plant; La Tribune, November 3rd 2005; Jdnet's chat, September 21st 2001.

business model articulates the "value proposition" (or the "benefits") to the customers (Chesbrough and Rosenbloom, 2001; Dubosson-Torbay et al, 2002), or more generally to the business partners of the firm (Applegate, 2001; Gordjin et al, 2000; Mahadevan, 2000; Osterwalder and Pigneur, 2002; Timmers, 1998; Weill and Vitale, 2001). This means that the business model identifies the market segment, that is the users for whom the technology, and more generally the offering, is useful but also the structure of the offerings. In order to seize these two elements, the literature in management refers usually to the couple product-market (Hamel, 2000). The originality of the business model is to make explicit the benefits of the offering, which are valued by the customer and for which she is willing to pay a certain price. The second component of the business model is the value chain or the value network (Applegate, 2001; Chesbrough and Rosenbloom, 2001; Dubosson-Torbay et al., 2002; Hamel, 2000; Magretta, 2000; Mahadevan, 2000; Maitre and Aladjidi, 1999; Rappa, 2001; Timmers, 1998). The firm is located in "an architecture for creating, marketing and delivering this value" (Osterwalder and Pigneur, 2002: 2) that it performs together with others, be they partners, competitors or simply other firms. Commonly, in order to describe these activities and actors the managerial literature refers to the concept of value chain developed by Porter in 1980. The business model implies for the firm to "define the structure of the value chain within the firm required to create and distribute the offering" (Chesbrough and Rosenbloom, 2002: 533). The first two elements of the business model - the value proposition and the value chain - depict the firm as a producer of value for its customers. The business model helps to explicit this value, to identify the activities needed to produce and deliver it properly to the customers and to choose which ones are to be carried out by the firm and which ones are left to partners or competitors. The last component of the business model is what could be called "the revenue model" (Linder and Cantrell, 2000: 2) or the "revenues structure" (Dubosson-Torbay et al, 2002: 7). The business model makes explicit how the firm generates revenues (e.g. Lucas, 2002; Maitre and Aladjidi, 1999) by "[estimating] the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen" (Chesbrough and Rosenbloom, 2002: 533).

Multiple occurrences and unification attempts

We start by defining the business model in order to identify what can be considered as a description of the business model, thereby uniting its multiple occurrences under a common notion. Nevertheless, even when we consider the business model as a coherent framework

defined in the literature, its multiplicity appears again when we consider the documents that firms produce in order to explain their business model. These documents may be dedicated to a large public or to specific audiences. Furthermore, they describe the business model with different levels of detail. Let us consider the case of Virtual Video Plant (VVP). For example in a press release¹⁰, VVP's CEO says: "*VVP, leader in technologies and devices of audio-visual self-production, allows the service operators in the media industry to develop interactive devices with video-clips. VVP's platform makes easier a faster and cheaper deployment of mass interactive audio-visual services*". In an article entitled "When Mr. Smith becomes Spielberg" and published in the monthly letter of the Incubator of Picardie¹¹, VVP's CEO describes in more detail: "*VVP's business can be summed up as the implementation of an audio-visual production platform. Concretely, it is about offering to "mister everybody" the means to create professional quality video-clips. For private customers, this is the end of the drawn-out holiday movie. For corporate customers, this creation aid is a tool that provides an access to a mode of writing difficult to tackle otherwise*".

Other documents explain the business model to a specific audience. Here again we can observe several levels of details in the description of VVP's business model. For example, the explanation of VVP's business model in an article that was published on a blog for small and medium businesses (SMBs) is dedicated to one type of customers, which are the SMBs. In addition, it synthesizes some of the elements described in the aforementioned documents like the ease to use the technology or its main advantages. Moreover, in its most developed form, the business model is described in a business plan¹² to the attention of investors, either public or private such as venture capitalists. All along the development of VVP, its founders had to write several business plans. In those very detailed documents (such as application files for public subsidies) they explain the business model and translate it into financial information. For example, VVP's application for the National contest of innovative venture creation in 2003 is a seventy-six-slides PowerPoint presentation¹³. Even if all these documents do not

¹⁰ «VVP ouvre son capital pour renforcer sa position de leader », press release, 11th of May 2006.

¹¹ The Incubator of Picardie is a public regional incubator

¹² The business model describes the mechanisms of value creation that can be found in every organization. It is an abstract description of how the business works. The business plan is the written version of the business model. It describes formally and with great details the business model and provides numerical data (drawn on explicit hypotheses) which allow its translation into financial results.

¹³ The CEO of VVP provided us with five documents addressed to investors in the context of firm creation contests organized by public institutions: two applications to the « National Competition for Helping the

require the same level of detail, entrepreneurs have to provide mathematical figures translating the literal business model described at the beginning of the PowerPoint presentation or application form.

Coming back to VVP's descriptions of its business model, we state now that the tension between unity and multiplicity that the business model bears makes it particularly useful for entrepreneurs who want to clear up for a particular audience what the value created is, how it is produced and delivered and finally what the revenue generation mechanisms are. This multiplicity of the business model allows its circulation. Indeed, the business model can consider specifically an audience to address relevant issues. For example when speaking to SMBs, VVP presents its business model by explaining clearly the benefits of its offerings to a specific category of customers and adapts the arguments to its specific needs. The offerings are not detailed, we only know their ends, what they enable and that they are easy and fast to use at a lowered cost. When addressed to potential investors, the description of the business model provides a literal explanation of VVP's activities and environment but it also enables the financial forecasts made at the end of the application and finally the demand for subsidies or venture capital. In its diverse material occurrences, the business model can have several functions: it is close to a corporate communication tool when addressing a large audience, to a selling tool when presenting the benefits of the offerings to a selected target of customers, to a demonstration tool through PowerPoint presentation or to an enrolment tool in business plans. According to the purpose of its communication, the description focuses on one or two of the three dimensions of the business model identified above.

The business model allows the entrepreneur to manage the tension between unity and multiplicity which is inherent to the project of commercialization of his technology. The multiplicity of the business model, which comes from the multiple audiences to which it is described, makes it portable and it allows it to circulate along diverse media. But at the same time, the business model must display a certain degree of unity in order to enable an agreement between the firm and its stakeholders – customers, investors, etc. – on a coherent value proposition, a way to deliver it and the revenue potentially generated. The management

Creation of Innovative Firms » organized by the ANVAR in the category « emergence » in 2002 and in the category « in creation process » in 2003, the application to enter the incubator of Picardie in 2003, the application to the « tremplin entreprises Sénat » 2004 organized by the French senate, the application to « Capital IT » 2005 organized by Mar-Tech & Finance, an agency promoting entrepreneurial networks and finally the application to « Talents » 2004, another contest of firm creation supported by public institutions.

literature, but also the bodies which provide templates for business models and organize teaching courses on how to write a business plan for example, contribute to the unification of the business model. For instance, Sofinnova, which is the largest venture capital fund in France, displays a “business plan model summary” on its website. The ventures searching for VC funding can download this document and have to follow the model developed to write the business plan that will be submitted and evaluated by Sofinnova. The business plan template is composed of five parts: the target market and its size, the company’s competitive position, the management team, the project’s development stage and financing needs and contact information for the company’s CEO. Entrepreneurs can also buy software such as “EBP Business Plan 2008”, which allows to write a business plan according to one of the four models offered by the software and to build financial templates with several hypotheses. With this solution, the entrepreneurs can build several scenarios. It also generates automatically a PowerPoint presentation from the business plan written. This software is drawn on the book “*Construire son business plan*¹⁴” dedicated to entrepreneurs and authored by a researcher in entrepreneurship and an entrepreneur who is vice-president of an academic spin-off. It guides entrepreneurs throughout the writing of the business plan and the building of the financial templates completing the description of the project. The parts of the business plan described in this book are quite the same of those in the model displayed by Sofinnova: history, founders, description of the project, market and competition, target market and strategic positioning, technology and technology protection, resources needed, legal elements, structure of the capital and numbering of the project. Such templates circulate between entrepreneurs, incubators, venture capitalists or technology transfer officers and contribute to unify what constitutes a business model and in particular a business plan which is the written version of a business model deployed on a period of several years (generally between three and six years). Actors involved in technology entrepreneurship share a common understanding of business models and business plans that relies on a large part on these templates, books or teaching courses.

¹⁴ “Construire son business plan” (Building your business plan) by C. Léger-Jarniou and G. Kalousis, Dunod, 2006

The business model as narrative device

Characterizing the business model as a narrative device

"Business models are at heart stories - stories that explain how enterprises work" (Magretta, 2002: 4). Magretta illustrates her arguments with the example of the Traveler's check. She describes the business model of Traveler's check as a story: « the story was straightforward for customers. In exchange for a small fee, travelers could buy both peace of mind (the checks were insured against loss and theft) and convenience (they were widely accepted). (...) Therein lays the twist to the plot, the underlying economic logic that turned what would have been an unremarkable operation into a money machine. The twist was float. In most businesses, costs precede revenues: before anyone can buy your product, you've got to build it and pay for it. The Traveler's check turned the normal cycle of debt and risk on its head » (Magretta, 2002: 4). We understand clearly that the business model is a story that allows describing in a simple way how a firm generates revenue by making its customers pay in exchange for a value delivered by the offerings. The business model works as a story because it is composed of delineated characters with specific motivations that explain their behavior (logically) and a plot that reveals the economic logic behind the business.

Scholars such as Lounsbury and Glynn (2001) have studied story-telling devices. According to them, story-telling is an important organizational practice whose main feature is the use of verbal expression or written language structured in three time-based structural components – beginning, middle and end – with transitions and event sequences propelled by plot lines and twists and shaped by defining characters. Any story consists of three basic elements: "a narrative subject in search of an object, an addressee (an extra-textual force, the source of the subjects' ideology) and a set of forces that either help or hinder the subject in acquiring the desired object" (Fiol, 1989: 279). Lounsbury and Glynn (2001) translate this definition for entrepreneurial stories. The narrative subject is the individual entrepreneur or the new venture, the goal of the narrative is a successful new enterprise, profitability, venture capital funding, etc. and the addressee is the corporate and societal environment in which the narrative subject operates.

The business model is quite close to a story-telling device except for its temporality. Like stories, business models have characters and a plot but they are not only told ex post. The business model "in the making" is emergent in corporate documents or press releases. It performs the modeling of the business. It can of course be told ex post, as in the example of

the Traveler's check above, and it can be used as a paradigm synthesizing a new way, often more efficient, to make business in a specific industry (e.g. The Google story, 2005, How Dell does it, 2006). But, when we consider the business model as an entrepreneurial tool, it appears in documents contemporary to the actions of the entrepreneur. In fact the business model can be considered more generally as a narrative device. Bartel and Garud (2005)¹⁵, drawing on Bruner (1990), define narratives as temporally structured accounts (with a beginning, middle and end) complete with a setting, organizational context, central characters, a sequence of events and a plot with crises and resolutions. A business model is a narrative device with several specificities. It is a narrative device with characters and a plot but without a classical temporality. What is interesting with the business model as a narrative is that it refers not to a chronos-type temporality but to a kairos-type temporality¹⁶. Indeed, the story is not deploying in time space but in a space of actions. In this space, characters intervene to perform a series of actions according to a logical sequence that is meaningful in terms of value creation logic. The business model of academic start-ups describes the logic of value creation behind the commercialization of a technology. It defines which activities are necessary in order to create and deliver this value and which actors are going to undertake which activity in a specific way. Here are the main characters of the narrative device "business model". As for the plot, it consists in the description of the revenue generation logic that follows from the characters and their interactions. We illustrate the narrative function of academic start-ups with the example of Acoustech.

The business model of Acoustech is described in a brochure available on its website. Acoustech offers "*non-destructive testing by acoustic emission applied to the field of materials and the structures*". The first characters appear. Among them, the materials that are alive, evolve, change and get worn. The structures are torn, they get constrained, old and deformed. A new character pops up: the industrial risk. "*Today, safety related to industrial risks has become an essential component within companies; the ageing of materials and structures represents a considerable risk factor.*" The context of the plot emerges. We must "*anticipate and detect the structure's defects*", "*control and follow the ageing of materials*",

¹⁵ Bartel C. A. and R. Garud (2005), The Role of Narratives in Sustaining Product Innovation, Working Paper

¹⁶ Whereas chronos-type temporality characterizes the external temporal frame within which an action may take place (this would be, for instance, calendar time), a *kairos*-type temporality is generated within the lived action itself: it is the time of opportunity or fortune.

"increase the safety and the life span of industrial plants and equipments". A new character pops up again: regulation laws. The plot twists. The main character, who is Acoustech's technology, bursts in: *"The non-destructive testing by acoustics emission makes it possible to check the reliability and the integrity of the installations while reducing the costs of maintenance. The primary advantage of this technique is to provide information in real time, in service, without disturbing the production."* We have just described the twist of the plot. The business model is synthesized here in a few sentences that explain simply complex processes and techniques and reveal the economic logic behind the business: testing the equipments and structures is a regulatory obligation, some techniques enable this testing at a low cost but they require a pause in the exploitation of the equipments during the control. Acoustech's services are more expensive but at the end the customer saves money because they do not disturb its production. The kairos-temporality used in the business model fits particularly well with entrepreneurial practices since entrepreneurship involves the discovery, creation and exploitation of opportunities (Shane and Venkataraman, 2000; Venkataraman, 1997). The kairos-temporality of the business model twists the opportunity. It characterizes the opportunity and at the same time the way to pursue and to exploit it.

The specific narrative functions of the business model

The business model as a narrative device performs some specific functions. The plot is timeless but works as an objectivation and translation tool¹⁷. The business model puts the customer, the technology and the underlying system of actions into words. It describes the targeted customers and renders their needs explicit. For Acoustech, it is relatively simple: the customers are the industrial companies that need to test their equipments at the lowest cost. This objectivation allows the entrepreneur to better define a demand and an efficient way to deliver its offerings. These objectified elements are sine qua non conditions for the model of revenue. They determine how the firm will get paid. The business model device is more than a mere communication tool. It helps the entrepreneur to conceive a coherent system of revenue generation by objectifying the customer, its needs and the answer to it in order to get paid in an efficient way. Furthermore, the business model translates the technological complexity into a value proposition.

¹⁷ We use this term in a sense similar to Callon (1986).

The business model emerged with the dotcoms and is now mostly used to describe revenue generation in high-tech start-ups. Thus, this device seems to be particularly relevant to deal with the complexity and the uncertainties associated with the commercialization of technologies. It is surprising then to notice that the technology is almost off the story. One important function of the business model is indeed to embed the technological complexity understandable by a minority in entities that may be valued by everyone, or at least by a larger public. The technological properties of the firm's offerings are embedded in the description as the possibilities and the benefits they offer to the customer. Acoustech's technology is quickly described as "non-destructive testing by acoustic emission". The customer does not know anything more about it but the business model tells him that it is technically and economically efficient. The technology is always the main character of the story and is the hero answering to the customers' problems. We do not know the precise characteristics of this hero (his size, his weight, etc.) but we certainly know about his capacities and his power. The business model is not only a selling tool because it is not only a promise. It brings evidence, so to say. In this case, for instance, the power of Acoustech's technology is "proven" because the European Commission charters it.

Concerning the processes of innovation, Lounsbury and Glynn (2001) insist on the crucial role of story-telling in the emergence of new firms. The business model has specific attributes and functions and it plays on some points a similar role to story-telling. One specific characteristic of the business model lies in its capacity to give a synthetic explanation of complex processes. It enables the entrepreneur to simplify in a few words the main mechanisms generating profit from the commercialization of a technology embedded in products or services. The business model as a narrative device develops some characters such as the customer, and its needs. It performs some functions such as the objectivation of the characters of the narrative, the translation of the technology into a value proposition for the customer and the legitimization of the heroic role played by the technology in answering customer's needs. Like the entrepreneurial stories described by Lounsbury and Glynn (2001), who draw on Salancik and Leblebici (1988), the business model told by the entrepreneur "strives to make the unfamiliar familiar by framing the new venture in terms that are understandable and thus legitimate" (p.549). According to Ashforth and Humphrey (1997: 53), narrative devices make sense of an equivocal situation because they "selectively distill a complex jumble of otherwise ambiguous and contradictory activities, pronouncements and impressions into a simplified a relatively coherent portrait". In a similar manner, the rhetoric in the business model unveils the value delivered to the customers and the revenue generation

mechanisms. It constitutes a coherent and legitimate portrait useful to enroll partners and customers.

The business model as a calculative device

How does the business model calculate? The case of Koala

The narrative of the business model is made of words, but also of numbers. The relative importance of the latter within the narrative depends on the type of business model as defined by the audience to which it is addressed. At the extreme end of the continuum – the business plan – figures, tables and numbers first shyly show up and then gradually take hold of the narrative. The presence of such actors, which pertain to the category of computation, leads us to examining the business model as a calculative device.

The calculation performed in the business model is clearly a peculiar one for it involves a heterogeneous set of logical operators which are not only mathematical or numerical. In our investigation of the business model as a calculative device, we therefore adopt a large definition of calculation which we borrow from Callon and Muniesa (2005). The business model carries out a calculation in the sense that it establishes distinctions between states of the world, by describing a given market space, then estimates the courses of action associated with this state of the world, by explaining how the value proposition of the firm will fit in this market space and reach customers, and finally draws the consequences of this choice, in terms of necessary resources and expected revenues.

Callon and Muniesa analyze calculation as a three-step process in which the entities taken into account are first "detached" and "arranged [...] in a single space", then "associated with one another and subjected to manipulations and transformations", or linked together in order to – and this is the third step of the calculation – extract a result (Callon and Muniesa, 2005: 1231). Let us follow the stages of calculation in a document describing a business model: the application of Koala for the National contest of innovative venture creation in 2007.

The first characters to come on stage in this document are the users that Koala targets (people who travel everyday on a route that they know well, such as commuters) and the three technical artifacts upon which Koala's offer rests (a widget, a website and a GPS smartphone). In the document, both the user and the technology are introduced as distinct graphical entities, separated by the lay-out of the page in which each entity is framed in its own paragraph; then

they are associated in a diagram which presents the three technical artifacts as a set of features that mix the actions of the artifact (e.g. the information that it displays), the actions of the user (e.g. follow a link, send a message) and the actions of third parties (e.g. advertising). The coupling between the technology and the user continues by the explanation of how the user is supposed to handle the artifacts and the conditions under which she can access various services some of which are free, while others require the payment of a fee the amount of which is precisely defined. The document pursues the stabilization of the user by resorting to market and feasibility studies which endow the user with needs, interests and habits.

Then a set of new entities are sorted out (e.g. content providers, location based services operators, distributors) and aggregated in a diagram, which represents the value chain of the industry. A first result is extracted by the association of the user, who has been endowed with preferences, and the companies in the value chain: the "*positioning*" of the new venture as an "*infomobility LBS¹⁸ operator*". This intermediate result allows the calculation to continue by characterizing the actors of the value chain as either competitors or partners of the new venture. The two new entities thus constructed (the new venture as a service operator and its competitors) are in turn associated one with another in a table in which Koala and the "existing offer", albeit separated in two distinct typographical spaces (the columns of the table), are linked together through their comparison along six different "product advantages" (the lines of the table). The table generates a second result: the "competitive advantages of the new venture, sources of value creation". As for the companies of the value chain which have not been characterized as competitors, a subset of partners (technological allies and suppliers) is selected. Once these four entities defined (a new service operator, its customers, its competitors and its partners) a numeric result can be extracted by the means of a final transformation. Customers and competitors are translated in terms of price of the product and number of products sold, while partnerships (e.g. suppliers) are turned into costs. Following a simple arithmetic operation, these figures produce a final result: the expected turnover and market share of the new venture.

The calculation performed in this documents leads to the gradual stabilization of the entities taken into account and to the extraction of three results which may consist in statements or figures: the new venture is a service operator, it creates value for its customers and it is likely to generate a given turnover. We can note that the results of the calculation can

¹⁸ LBS stands for Location Based Services, i.e. wireless 'mobile content' services which are to provide location-specific information to mobile users moving from location to location (source: Wikipedia).

now leave the calculative space of this document and circulate as independent entities. But before letting them out (which we will do in the last section of this paper), let us turn back for a moment to the conditions of their production.

A heteronomous and twofold calculation

Callon and Muniesa (2005) put emphasis on the arrangements in which a calculation takes places and raise the question of the extent to which they allow calculation and generate asymmetries. What does the calculative space of the document describing Koala's business model allow to be calculated? First let us note that Koala's application for the National contest of innovative venture creation is based upon a model provided by the institution which organizes the contest (Oseo-ANVAR). As mentioned above, venture capital firms publish similar templates for business plans on their websites to the attention of entrepreneurs who seek financing. The template defines the entities to be taken into account (e.g. technology, market, competitors), their weight and their sequence, which bears consequences for the result of the calculation. For instance, in the business plan template available on the website of the French venture capital firm Sofinnova, the "market" is mentioned nine times, while the "technology" only once, as if the technology was considered as stabilized and agreed upon, and did not need to be calculated¹⁹. The ordering of the different stages of the calculation matters too for, as we noted for Koala's business model, an intermediary result may consist in the construction of a new entity which is in turn associated to others so that a new result could be produced. The categories in which the entities are to be grouped in, by means of their characterization and association, and the way the calculation unfolds, are imposed by the agency to which the calculation is addressed. The calculative device is thus designed by a third party, which leaves the entrepreneur in a "heteronomous" position (Callon and Muniesa, 2005).

If the technology is considered as an input in the calculation, what is then to be calculated in the business model? Let us resort once again to the investigation tools that Callon and Muniesa (2005) offer and draw attention to the process of objectification and singularization which, according to the authors, allows goods to be made calculable. In Koala's business model the association between three technical artifacts and the user supposed

¹⁹ In this respect the business plan embodies an ideal model of technology transfer which implies a linear sequence of technology development and technology commercialization.

to interact with them simultaneously objectifies the properties of Koala's product (provide a travel duration and an arrival time) and singularizes it by inserting it in the user's world (a figure, let's say 20 minutes or 5:50pm, is available for the user and its entourage who can adjust their action plan according to this new piece of information). Yet this is only part of the calculation performed by the business model. Koala is also endowed with objective properties throughout the calculation. The entities with which Koala is associated in order to be turned into a service operator are the other companies in the value chain; the product “Koala” is profiled and positioned in the world of location-based services. However, this is not the world of the investors who are to buy shares of the company, to whom the product “Koala” (the new venture) is offered, and for whom the objectified properties of the company are to be endowed with value.

In fact, a venture capital fund is a pool of partners who specialize in different sectors of activity (e.g. software, biotechnology, engineering science). Their investment capacity is limited by their funds, their risk management policy and their exit requirements. Each partner proposes projects that she has to defend by convincing the other partners of their quality. From the point of view of the venture capital firm, each project is in competition with the projects supported by other partners in the same sector or in other sectors. The entrepreneurs who endeavour to obtain the investment of the venture capitalists are usually not aware of the projects that they are competing with. In other words, the entrepreneur does not know the world of the investor to whom she attempts to sell shares of her company. The investor provides a template for the business model which excludes her own world from the calculation. Even though the business model attempts at calculating both the new venture and its product²⁰, the design of the calculative device impedes the singularization of the former, thereby preventing its calculability.

However such a conclusion on the incompleteness of the calculation performed by the business model only holds if we limit our analysis to the business model as a still piece of paper. The business model can indeed be a still piece of paper – that is how we have approached it in this section in order to seize its calculative ability – but this is no more than a stage in its career. Once the entrepreneur has downloaded the templates on the web sites of ANVAR or Sofinnova and composed a document for his/her own new venture, the business

²⁰ The relative importance granted to each of these two goods depends on the type of business model: emphasis put on the company itself as an object of calculation increases when the business model is addressed to an investor.

model starts traveling. The business model is a device that calculates specific goods, with more or less success, but it is also an arrangement that allows this calculation to be told to the agency to which it is addressed. It can therefore be considered as a "configuration [that] calculate[s] encounters" (Callon and Muniesa, 2005: 1242). It organizes the encounter between supply (the new venture) and demand (customers or investors). If the business model enables (or not) and shapes these encounters, it is in turn gradually forged by them, as we will see in the following section where we let the business model circulate and follow its journey.

Managing the tension between framing and overflowing with the business model

The evolution of Koala's business model

In this section we consider the business model in action and follow the track of the entrepreneurs by collecting the traces left by their encounters, which form a series of documents describing the business model of the new venture. In the case of Koala, the business model that we examined in the previous section (dated February 2007) is the last trace of a journey on which a couple of entrepreneurs (whom we will call Robert and Alexander in this paper) embarked two years earlier.

The technology that Koala endeavors to commercialize was developed during a research project in which Robert and Alexander's laboratory was involved. On the web site of this research project we can read that the technology enables spotting the natural and infrastructural conditions in the surrounding of equipped vehicles and transmitting the data in real time to a central server that analyzes them and generates new data to be communicated to drivers and road authorities. Robert and Alexander got interested in one of the applications of this technology – the computation of the travel time between two points – which, they believed, bore a commercial potential. The problem, as Roberts explains, is that *"it is a bit like the weather forecast, the content can be applied to so many things. (...) The whole problem lies in the business model of this thing"*.

The entrepreneurs' first idea was to position the company as a software editor. In a presentation that they gave in October 2005 at the public research organization in which they were still working at this time, they described the soon to be born new venture as a *"transport-oriented software and consulting company"* which offered *"vehicle-infrastructure cooperative solutions"*, or an *"infostructure for transport"*. The typical customer was the manager of a vehicle fleet who, thanks to Koala's offer, would be able to optimize his/her

management through navigation terminals prescribing the route to follow to professional drivers. With a PowerPoint presentation at hand, the two entrepreneurs devoted one year to meetings. As Robert explains: "*During one year, we went round all the actors of the market. Our strategy was to sell dreams, to sell to service and info-mobility operators their own dream. We sold something that did not exist, this was slideware. (...) Some operators wanted to invest in our company but we could not say yes because our project was too early stage. However it allowed us to make talk*". The business model described in their slides can be found in Koala's first application for the National contest of innovative venture creation in February 2006. In this document, Koala's solution was still presented as "*an infostructure for transport*". The needs to be satisfied were still those of the companies operating professional vehicle fleets. The envisaged customers were the operators of data communication and traffic information in the services of which Koala's components are supposed to be integrated, while the competitors are companies that offer software for traffic information. As for the technology, it consists in a logistics management software to be installed on the server of the operator as part of an existing ERP or CRM²¹ system and an on board unit and a PDA with which the vehicles are to be equipped.

The association between Koala's software, infomobility service operators, fleet managers and vehicles that had been built by this business model then passed two key tests that had a common configuration: a meeting during which the business model of the new venture was presented in a written and an oral form. The first test, which consisted in meeting "the actors of the market», came to nothing because nobody seemed willing to buy Koala's product. The second encounter took place at the contest where Koala's business model was to be assessed by an expert (from the consulting company Ernst & Young). Even though Koala's project was one of the winners of the contest, the meeting with the expert resulted in the conclusion that the business model presented in the application was not viable. Following the expert's advice and the failure to sign any contract with the actors of the market, Koala was constrained to change its business model.

According to the first business model for Koala professional drivers and travelers are the clients of the new venture, while private customers are considered only as prospects. Ernst & Young, to whom Koala could commission a market survey with the award that it won at the contest, turned the spotlight to these private users that the entrepreneurs had left aside. The need to know travel time is indeed not restricted to professionals. As Robert told us, "*Today*

²¹ ERP stands for "Enterprise Resource Planning", and CRM for "Customer Relationship Management".

there is a problem of congestion and uncertainty regarding travel time, which the drivers do not stand. (...) Our target is people who drive everyday". However, the reorientation of the business model from B2B to B2C²² is a costly process. With the removal of professional fleet managers and service operators, and the association of private customers, the whole network built by Koala's innovation had to change. A software solution could not hold Koala and its private customers together. The construction of a new user entailed a change in the technology in order to enable the attachment of the former to the latter. In order to bring a solution to the private drivers who seek to minimize their travel time, Koala had to turn its technology from software to the provision of a service. Koala's motto is no longer "Infostructure for transport" but "I know when I will arrive". This new business model allows the expert to be associated to the new venture through Ernst & Young's validation of Koala's new positioning, which in turns paves the way to the association of Oseo-ANVAR (the organizer of the contest) who grants an award, and thus a significant amount of money, to the new venture. Whether this business model will succeed in associating everyday drivers like you and me, whether it will resist to the tests to come, remains to be seen.

Framing, circulation and overflowing

Following Koala's business model in action leads us to considering a configuration involving a heterogeneous collective composed of the entrepreneur, the technology, the business model as materialized in a presentation and the network that it draws through the story that it recounts, and those to whom the calculation that it performs is addressed. This collective is continuously recomposed through a series of encounters, which may lead, or not, to its stabilization. As we showed above, the business model allows these encounters to take place and organizes them by acting as an input. Moreover, when we consider the business model in a dynamic perspective, we can see that the business model is also an output of these encounters.

We believe that the notions of framing and overflowing (Callon, 1998b) are instrumental to understanding what the business model does in these encounters. The situation from which academic entrepreneurs depart is characterized by the multiplicity of possible but uncertain applications, or by overflowing. Like the founders of Acoustech and Koala for instance, they need to choose a path to follow among the so many potential applications of the

²² B2B stands for "business to business" and B2C for "business to customer".

technology that they aim at commercializing. The business model forces the entrepreneurs to do so: in order to make the calculation possible, the list of the entities to be considered in it needs to be limited. The business model initiates a framing of the technology by drawing a line between the actors who are taken into account and those who are not. For instance, Koala's first business model excluded private drivers from the calculation that it performed and included professional ones in it. The business model makes the initially overflowing situation calculable and thus framable. Nevertheless, for the framing to continue, a large set of associations need to be realized: for instance, between Koala's software, the pre-existing fleet management systems in which it is to be integrated, and fleet managers, and between Koala's on board unit, the customer's vehicles, and the professional drivers. In order to realize these associations, the business model has to be put into motion. The entrepreneurs show their PowerPoint presentation to potential customers and investors; other agencies are involved in the calculation by the business model, which in turn becomes a source of overflowing. In the case of Koala, the business model "software editor" did not succeed in framing the technology for it failed to associate other infomobility service operators and fleet managers to Koala's software; yet, the circulation of this business model allowed new links to be created around a new actor: the private customer, who had been present in the business model but up to then neglected.

The business model is a device that allows the tension between framing and overflowing to be managed: it makes an initially overflowing situation calculable and thus framable, while at the same time, by circulating, it gives rise to new opportunities for overflowing. If in the case of Koala this process is still ongoing, many entrepreneurs succeed in their framing endeavor and create market activities (sell a product or service) from a series of interactions located outside the market (the encounters described above). This was the case of another French academic spin-off, now widely known as the "shopbot" ("shopping robot") Kelkoo, which is analyzed by Doganova (2008)²³. In their first business plan, Kelkoo's founders envisaged a company that would license technology and sell complementary professional services. The business model linking Kelkoo's software components, corporate customers and venture capitalists did not pass the test of the encounter with the investors. Nevertheless, it gave a grip to the investors and the entrepreneurs to pursue the framing of the

²³ Doganova L. (2008), *Entrepreneurship as a Process of Collective Exploration: The Role of Collaborations in Academic Entrepreneurship*, Paper presented to the Science and Technology in Society Interdisciplinary Graduate Student Conference, Washington.

technology by attaching to it the Internet users searching for a better price through its transformation from software to a website and a search engine.

The business model: a tool for collective market exploration

The novel perspective that we have adopted here sheds new light on two types of actors which have usually been either neglected or confined to very specific roles in the literature on entrepreneurship. The entrepreneur is not alone: he is equipped, albeit with the quite peculiar device that the business model is, and surrounded. Considering the entrepreneur's business model and partners together provides us with new insights on the part that they both play in the entrepreneurial process.

In the management literature on young technology-based firms, the role of the partners of the new ventures is usually restricted to supplying the resources that start-ups lack (e.g. Stuart, 2000; Teece, 1986). However, in the case of Kelkoo, the role of the venture capital firm cannot be restricted to the provision of financial resources: by conditioning their investment to the revision of the business plan drafted by the entrepreneurs, the venture capitalists participate to the crafting of a market. Technology entrepreneurship is distributed in the sense that it involves the action of various actors and "the creation of new opportunities by a collective" (Garud and Karnoe, 2003: 280). The partnerships that academic entrepreneurs establish in order to create a market for the technology that they wish to commercialize can be defined as market exploration partnerships, a category that has not received any attention in the management literature yet because its very possibility has been denied by the gradually established incompatibility between market-orientation and exploration in alliances (Doganova and Mustar, 2007)²⁴. Such exploration partnerships lie at the heart of the entrepreneurship process (Doganova, 2008).

In order to establish market exploration alliances, entrepreneurs need to make potential partners interested in the innovation that they wish to deploy and enroll them (Akrich et al., 1988). The business model is an appropriate device for the management of such partnerships:

²⁴ Doganova and Mustar (2007) show that the application of the exploration / exploitation dichotomy, which was introduced in the literature on organization learning by March (1991), to alliances has resulted in the gradual establishment of an equivalence between market-orientation and exploitation, while exploration was associated only with technological alliances. Doganova L. and P. Mustar (2007), Towards a Framework for the Study of Exploration, Exploitation and Innovation in Alliances, Paper presented to the EURAM Conference, Paris.

it is hard enough to make the initial situation calculable and trigger the interest of third parties, but at the same time it is flexible enough to allow the changes necessary for the enrolment of partners to take place. The market creation path of the entrepreneurial team can be described as a series of tests which consist in the encounter between the entrepreneurs, their business model and the partners that they seek to enroll. These encounters may come to nothing (like when Koala met the actors of the market) or result in the enrolment of partners (like when Kelkoo met the venture capital firm). In both cases they lead to a transformation of the network (to be) built by the entrepreneur's innovation. When partners are not interested, the entrepreneur cannot pursue his/her framing endeavor with the current business model. When partners get interested, their adding in the network of the innovation entails its reconfiguration: some links have to be cut so that others could be created, any change in the “sociogram” of the innovation entails a change in its “technogram”, and vice versa (Latour, 1987). Encountering and enrolling partners is not a smooth process: each encounter puts the entrepreneur's business model to a test and may lead to costly changes in the technology and in the entrepreneur's alliances. We contend that the business model does not reflect a market, as those who criticize it tend to consider; it experiments a market. If it resists to the series of tests to which it is submitted, it is gradually stabilized, together with the network of partners enrolled. In other words, if the business model resists to this series of tests, the associations that it has built get more and more solid and the business model becomes more and more real (Latour, 1984, 1987), until it is no longer a model, but business.

Conclusion

In this paper, we go beyond the criticism that management science has addressed to business models and explore the functions that the business model, as a device used by entrepreneurs, performs. In our perspective, the business model is not the transcription of an existing market in which a technology is slotted, but a device that allows the experimentation of new markets by an entrepreneurial collective. The business model tells a story and prepares a calculation: both the story and the calculation are addressed to potential partners that the entrepreneur seeks to enroll. It organizes a series of encounters which gradually lead to the transformation of the business model and hence of the heterogeneous network of users, technological artifacts and investors that it holds together. Both multiple and unique, this peculiar device turns out to be particularly efficient in managing the tension between framing

and overflowing, that is inherent to the highly uncertain process of technology entrepreneurship.

Considering the business model and the collective that it attempts at building in the same perspective, this article contributes to the literature on entrepreneurship by shedding light on the roles of the devices used by entrepreneurs and of the partners that they enroll in the process of market creation. This paper suggests that the analysis of R&D processes should not only consider networks of actors but also the material artifacts. This new approach allows us to give a comprehensive view of the entrepreneurial agency at work in technology development and commercialization.

More precisely, a business model articulates in a unique way values implicated in innovation processes: the value that the venture delivers for its customers, its partners and its stockholders. However, it also works as a model since the logic or architecture of values in a particular business model is transposable in very different contexts. For example, the low cost business model originally developed by airline companies circulates in a growing number of sectors. The business model is a structuring device with many properties of scientific models (Morrison and Morgan, 1999) such as autonomy or representativity. Scientific models represent both science and reality but they remain autonomous from these two extremes. These properties permit the business model, which is neither the practice of management nor management science, to mediate between and explore reality and theory in innovation, thereby structuring the economic world.

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