



Business Model Innovation Through Design Led Innovation: An Experience From the Machinery Industry

Fabrizio Maria Pini

MIP Business School – Politecnico of Milan

pini@mip.polimi.it

Keywords: strategic design, business model, innovation, innovation workshop, service design, insight, organisational dogmas.

The interest for disruptive change as a source of competitive advantage has recently brought the attention of researchers and practitioners to the business model as a key element of the innovation process. In order to generate new and alternative visions on the business model and the value proposition companies should rely on a set of models and tools that allow employees to “see” the present challenges differently and then design possible alternatives. The set of techniques and models that seems to offer a new span of innovation relies in the design practice and in its integration with business model functioning and structure. The experience of a machinery manufacturer in Italy offered the opportunity to test a set of tools for business model design and innovation and verify the quality of the output through a set of innovation workshops that involved over 150 employees in the process of shaping possible scenarios and designing new service based business models for the company.

The evolving nature of the business model construct

In a similar way to many other managerial constructs, such as strategy (Mintzberg, Ahlstrand and Lampel, 1988), business model is not defined in a consistent way in managerial literature. This potential confusion is increased by the misuse of business construct in business community. As recently stated by Rajala (2009): “The current semantic confusion related to business models is complicated by consultants and practitioners who use the term business model to describe any unique aspect of a particular business venture”. Business model definitions, in the last forty years, has evolved following the evolution of managerial studies and the new forms of organisations, enriching the scope of the construct as well as its key aspects. Early works defined business models as models for organisational effectiveness, concentrating on computerised models in which a simple modelling of business functions was seen as a necessary aid in managing company’s processes and routines. In this definition business models are very much like the architecture supporting processes and enabling routines.

A decade later, the interest of researches moved to considering business models as the layer between strategy and operations (Mintzberg, 1987). Business models were described as tools to support strategic decision through the representation of the overall impact of managerial decisions on the corporate structure and components. Business models could also support decisions taken into specific functions of the organisations thus supporting sales efficiency and operational excellence. Following the shift from value chains (Porter, 1987) to value networks (Normann and Ramirez,1994) as key sources of competitive advantage in strategy literature, business models were described as models to support inter-organisational strategies (Hamel, 2002) especially in digital environments (Hanson,2000; Magretta, 2002; Lee and Vonortas, 2004). Business models were used as support to the optimisation of the whole supply chain or as the map to support reengineering processes. In digital environments business models were used to depict the way by which companies aimed at delivering value to the market and the underlying revenue model in new and uncertain markets.

In recent years, the business model construct has been progressively enriched, becoming a fundamental part of business innovation and a source of new value creation. In particular, a strong emphasis has been given to the business models as the tools to transform into value the outcomes of open innovation and collaborative environments (Onetti e Capobianco, 2005; Mitchel and Coles, 2003; Chesbrough, 2004; Chesbrough and Appleyard, 2007).

Despite these evolutions and modifications of business model construct, there seems to be some common background to what a business model stands for: business models are the structures through which companies perform the two crucial macro processes of value creation and delivery and value capture from the market (Rajala, 2009). In this sense, the construct evolution follows the evolution of the sources of value creation and the way through which companies turn market opportunities into desired performance outcomes. In

this sense, following the definition of Osterwalder and Pigneur (2009), business models are the missing link between strategy and business processes and describe the rationale of how an organisation creates, delivers and captures value. Hamel (2002), though sharing the same vision about the functions of business models (i.e. creating and capturing value in a very unique and hard to imitate way), encloses strategy (mission, scope of business and basis for differentiation) in the components of business models. In this sense, business models do not bridge between strategies and processes but represent the essence of differentiation, from strategy formulation to the assets and resources, internal and external, needed to support the strategy and turn it into operational processes. If strategies become a part of business models the construct will be less perceived as an architecture sustaining processes and receiving its shape from strategic decisions and more than the essence of business itself, a sort of corporate DNA, enclosing in itself the whole potential for innovation.

The components of business model

There are many different representations of business model structure in managerial literature, from very simplified ones to rich and articulated. Despite this diversity it is possible to find some common features in many of these representations. Such features could be summarised in the following way:

The offering or value proposition. This represents “anything offered to the market that might satisfy a want or need of the targeted customers” (Chesbrough, 2007). In addition to this definition, the value proposition should also show the reasons for differentiation and explain why the offering itself is a better solution than the other ones available on the market. In many business models representations, such as the business model canvas (Osterwalder and Pigneur, 2009) which has gained large popularity among practitioners, the competitive dimensions of the offering is not particularly stressed in favour of a deep analysis of customers needs and wants. The misperception of the relevance of differentiation among the dimensions of value proposition might implicitly risk to produce offerings that lack of distinctiveness or are particularly weak when compared to existing solutions.

The customer segments. It is implicit in the definition of value proposition to have a clear perception of the receivers of the value created for the marketplace. A description of the targeted customers should not only focus on descriptive variable such as lifestyle or demographics, but should have present a deep understanding of the behaviours of customers and the kind of activities they perform under the scope of the value proposition.

The revenue model. It explains the way through which the company extracts value from the market and is related to revenue sources, pricing policies and strategies, transaction models and margins and volume policies. Even though some authors (Morris et al., 2005) include the

cost structure in this part of the business model, it might be argued that costs should be more related to key processes, procurement and distribution structure and policies and value chain activities and be taken only as an input for the determination of the revenue model.

The internal resources and assets. These elements might be perceived as the internal building blocks that allow to develop and implement the business model. They are related to both tangible and intangible assets, as well as knowledge and relationship resources that support the value proposition and generate, through their combination in processes and value chains, a sustainable competitive advantage.

The network of suppliers and distributors. These subjects are the external part of the business model and they contribute to the creation of the value and its delivery to the final customers. The external network is composed by primary and secondary stakeholders (like debtors, public institutions, etc.) that might affect company's performance.

The key processes and value chain. This part of the model shows how the company performs its key activities utilising key resources and assets and integrating with the external network (Ankenbrand, 2011). This component of the business model bridges all the other parts and shows the different kind of relationships between all of them.

Together with these elements it might be appropriate to take into consideration the organisational culture and its values and beliefs. These aspects play a crucial role in shaping the business model and giving it consistency over time (Bateson, 1955). This "soft" element is also the glue that virtually keeps the business model together by generation a common set of frames, perceptions and values among the employees.

Business Model Innovation

The interest for disruptive change as a source of competitive advantage (Chirstensen and Raynor, 2003) brought the attention of researchers and practitioners to the business model as a key element of the innovation process. Managerial literature on the topic has been focusing very much on the role of innovators, enlightened CEOs and other revolutionary characters as the cornerstones of any radical change in the organisation. Most of the effort in the organisations is then focused on finding these actors of change and promote their views to redesign the business model. This approach to disruptive change shows some limitations on the following aspects: In organisations with a strong culture it is very hard to grow or even detect innovators as most of the people share the same view and beliefs about what is the value proposition and how to sustain it. Innovators might find it difficult to "sell" their vision internally and draw company attention on their ideas. In fact their new ideas of value have an impact on all the layers of an organisation: the strategic context, the organisational context and the emotional context, too (Doz and Thanheiser, 1996). In these conditions resistances

from the established culture might be overwhelming. As stated by Mintzberg et al. (1998) quoting Hurst: “Changes in destination might be made by the captain even less frequently, for they require a total value change in the organisation. And discoverers may find a new world only once in a lifetime”. In this sense, the faith in innovators as the only visionaries and responsible for change in the company might limit the chances to catch up with the rate of change required by the external context.

In order to generate new and alternative visions on the business model and the value proposition companies should rely more on a set of models and tools that allow employees to “see” the present challenges differently and then design possible alternatives. This requires a set of tools that helps organisations in:

- Overcoming their organisational and cultural dogmas and beliefs;
- Seeing the big picture and discovering new customers’ insights and latent needs;
- Visualising alternative value propositions and business models;
- Designing innovative business models with a clear perception of the changes required and the constraints to overcome.

The set of techniques and models that seems to offer a new span of innovation relies in the design practice and in its integration with business model functioning and structure (Bucolo, 2011). The work of Schön (1983), Polyanyi (1998) and Ehn has formed the foundation of the Design Led Innovation model which has been developed. Central to this approach is the ability of the designer to construct and visualise multiple futures of an unknown complexity, which are then deconstructed to reveal needs and opportunities.

Business Model Innovation through workshop based process: the case of an Italian manufacturing company

The experience of a machinery manufacturer in Italy offered the opportunity to test a set of tools for business model design and innovation and verify the quality of the output. The company faced in recent years a consistent decline in sales of machinery due to global competition and market conditions and it was forced to re-thing its strategy and business model. The fundamental challenge was the one of developing a consistent line of business through services. One of the most critical aspect in designing this change was in the strong manufacturing culture of the company and the fundamentally technical and mechanical background of most of the employees. These aspects made it very difficult for the company to “see” a different future and a different way to make its earnings.

The solution that the company decided to choose to overcome these difficulties was based on the massive involvement of a large part of the employees (150 people) in a series of ten innovation workshop, designed and facilitated by the author and a team of four consultants, aimed at designing possible business models for new services. These workshops have been managed through the support of facilitators familiar with the Design Led Innovation approach and have been structured around two phases: (i) Overcoming organisational dogmas and envisioning the future; (ii) Designing a possible business model for the service business. The techniques that have been adopted in the different phases are related to: scenario building and storytelling in the first part to generate insights related to the needs and expectations of customers and overcome dogmas limiting the ability to see customers and their needs under a different perspective; business model definition through the use of the model proposed by Oserwalder and Pigneur (2009).

The results could be evaluated under different aspects:

- All participants were able to define their limits in looking at customer needs and reconstructed the whole customer experience identifying new needs and insights;

- The needs identified in the first part of the workshops led to a very rich variety of business models to support the service offering. Each workshop produced three different business models. Business model formulation contained: value proposition; customer segments; channel definition; customer relationship model; sources of revenues and revenue models; key activities; assets needed; partners need to create and deliver the service. All this led to the evaluation of possible revenues and the cost structure needed to create it.

The company was then able to review all the business models proposed, the need categories detected and draw a new possible line of business overcoming the constraints that did not allow management to clearly see the market for services and plan an adequate offer.

The project phases

The project was composed of several phases that involved various subjects within the organisation and generated different results.

Setting the agenda for change

The first step was the definition of the overall goal of the innovation process and the expected impact of the ideas generated on the whole company performance. This part of the project consisted in a series of meetings with company's top management to establish a proper agenda to foster innovation, gain a clear vision of company markets, structure and present business model and commit top managers to the final outcome of the project. The goal of these

meeting was to: i) identify the lines of business development depending on the amount of resources available and the overall corporate strategy for the years to come (which markets to address; which product lines to launch; how many economic and knowledge resources could be acquired); ii) select an area of development that could be addressed through innovation workshops. In this case, the launch of service to couple with the existing product lines was considered critical since it presented a high potential in terms of new sources of revenues and differentiation but it was somehow very difficult to develop depending on the strong mechanic and product related culture of the company and its employees; iii) establish a goal for the innovation teams that might be at the same time challenging and yet accessible. In this case, top managers decided to attribute to the different teams the same goal: i.e. to increase revenues by 10% in the next three years through the introduction of new services and without affecting present product lines. It was agreed with company management to involve a large portion of the employees (150 individuals, as stated before in this work) in the innovation process with the aim to: i) offer a signal of radical change of present organisational culture based on product centricity and functional fragmentation; ii) work with teams composed of subjects coming from all the functions and staffs of the company to acquire different and sometimes conflicting points of view and cross-fertilise workshop participants. The use of mixed teams was functional to the goal defined: since the notion of services as separate line of business and source of revenues was very far away from company perception at that time, there was a need to collect diverging opinions and points of view on customer value perceptions. With the use of intact teams it would have been more difficult to overcome dogmas and cultural limitations since all participants' perceptions would have been aligned on pre built ideas influenced by their functional role.

Configuring and managing innovation workshops

Every single innovation workshop was designed to last two days and aimed at generating new insights for the service business and propose alternative business models that could help the company reach their goals in terms of economic growth. Since the number of people involved was very high and the time span was somehow short (the whole project should take no more than ten months), it was agreed to compress the time for each workshop to only two days. The fact that, working for a medium size company, most of the people already knew each other really helped a lot in speeding up workshops and having people working together without too many frictions and misunderstanding right from the start.

Each workshop was divided into four separate parts, strictly connected between them. The different phases were designed to help people overcome organisational and industry dogmas that might limit their ability to foresee areas on innovation and new business, reshuffle their present knowledge about products, customers and markets and define new possible scenarios

for their offer to add value to customers, generate new ideas and eventually structure them in adequate business models. The need to force people to formalise not only service ideas but also the business model to support them was originated by the belief, shared with managers, that in many cases even existing services, already offered by different players in the marketplace, could be innovated through a radically new business model to deliver them.

Each module lasted for two to four hours and generated a specific output that was functional to the success of the following parts of the workshop. The different module structures and the techniques adopted could be described as follow:

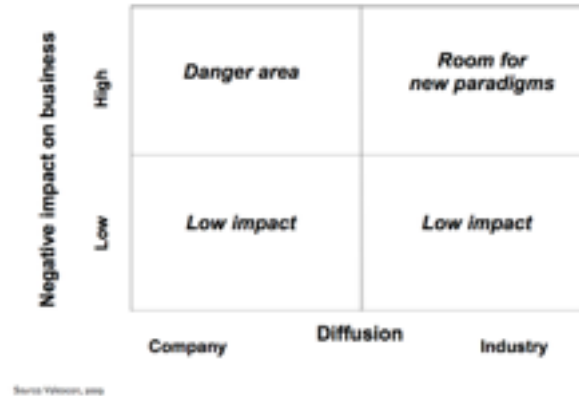
Overcoming organisational dogma

This was the first module for the participants after a short introduction on the workshop goals and agenda and some definition of services and business model. The group was exposed to some dogmas that in the past limited many companies in “seeing” the future and was then invited to discuss in sub groups the different dogmas that exist in the company. In this stage, participants were asked to generate an adequate amount of company and market perceptions that they perceive as possible dogmas limiting their ability to innovate and then report them on post-its and stick them on the wall of the room randomly. After this part had been completed, with the help of a facilitator, dogmas were clustered together in macro groups depending on their content: for example there might be managerial dogmas (“we have no time to plan long term activities”; “new ideas cost a lot of money”, etc.); market dogmas (“our customers are very traditional and do not like new ideas”; “there is no future in serving small business”, etc.); competitive dogmas (“we have to follow market leaders”; “we cannot compete on costs”; etc.) or organisational ones (“careers are made in functions”; “it is difficult to integrate people coming from different sectors in our company”). The explicitation of dogmas allowed participants to discuss about them and develop a more open minded approach to observation and perception of external menaces and opportunities. A particular attention was given to the discussion of market and customer dogmas, since participants tended to follow the beaten path on this subject, representing their customers in a traditional and over simplified way and showing a lot of resistance to question the elements of value that customers might like to receive a part from the product.

After the clustering is done participants are invited to attribute a level of danger for the success of their company for the different dogmas and clusters and represent them in a matrix as the one presented in Fig.2.

The “dogma wall” was then part of the following process as participants could refer to it when developing new scenarios or insight or new ideas to verify if they tend to fall into some kind of “dogma trap” or to subvert them as source of inspiration.

Fig. 1: a matrix for the evaluation of the impact of dogmas on performance



Scenario building and knowledge generation

Following the dogma explicitation, participants were asked to depict a possible scenario for the next three years for the final markets and sectors of their customers. The technique used was the billboard one. In a first stage participants, divided in sub groups and using photos, images and drawings were asked to represent the major changes that would take place in the different macro environmental categories (political, economic, social, technological, etc.) in the near future. A second activity, with the same tool, is devoted to the representation of the micro environment, taking into consideration the evolution of competition, demand and distribution for the company clients. In this second case, a set of researches and other sources of professional informations were prepared and presented in order to support the participants with some quantitative background on the subject.

Billboards are then presented to all the groups and discussed in a plenary session. After the description of the possible trends in all the different aspects of the external environment, groups are asked to put all these information together creating story with a dominant theme that has their customers as main characters using storytelling techniques as the backbone of this activity. The story could be represented through drawings or simply text but it has to contain all the dimensions of the macro scenario and to represent the customer and its organisation as the main character. Some groups, for example, depicted scenarios dominated by the theme of resource scarcity and the need to increase the rate of savings in transformation processes due to increase in all company costs, while others focused on

environmental issues, de-localisation of small business or digitalisation of retail and distribution.

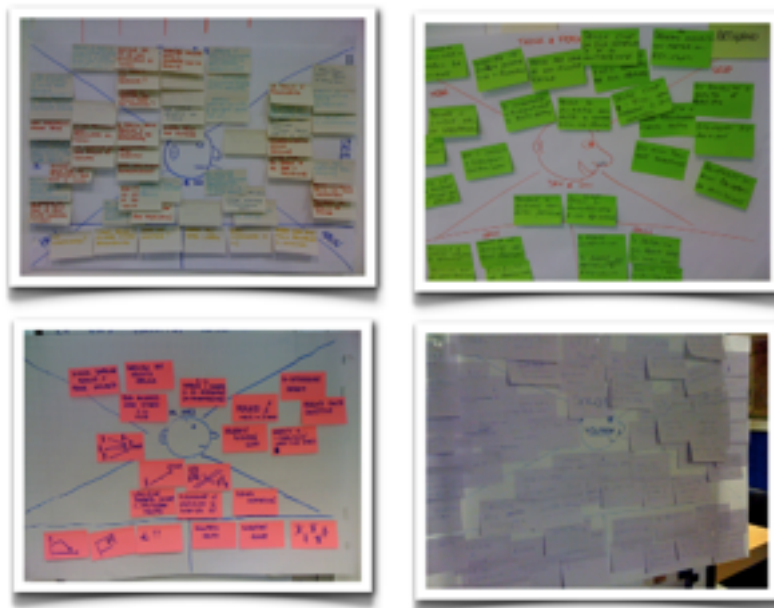
Insights identification

On the base of the different stories presented, participants, always divided into small groups, defined the insights related to the main concern and interests of the characters previously depicted. The tool that has been adopted was the empathy map of Xplane (Fig.3) (Osterwalder and Pigneur, op.cit.). This map has forced participants to act and think like the customer they had described imagining, on the basis of the environmental dimensions they used to tell the different stories, what he sees, feels, hears, thinks, which are the main activities he/she undergoes. On the basis of these perceptions participants were able to identify the pains and the gains that their customers want to avoid and achieve. As a result of this process the various groups were able to identify latent needs and wants of their potential customers overcoming their product based corporate culture and have a clear vision their effective needs that appeared to be not linked to the usage of machineries but to the future of their companies, digitalisation of marketplaces, environmental concerns and lack of skilled labour force.

Service idea generation

Using the Empathy map as a starting point, participants generated ideas of possible services that might help their customers satisfy their emerging needs and avoid their major threats about the future scenario. In this phase of the workshop, people found useful to return to the dogma wall to subvert dogmas as a trigger for more creative thinking. During the different workshops different creativity techniques have been adopted (visual thinking, storytelling and prototyping) providing on the whole very similar results. The idea generation stage was divided into two different parts: i) in the first, part participants generated a huge amount of ideas related to the needs identified having as a goal to create the highest number of ideas as possible; ii) in the second part of this activity the ideas generated were clustered in families and used to develop “second level” ideas that might then be selected by the group following a grid of evaluation that helped to rank the ideas in terms of innovativeness, scalability, differentiation, new value for the market and time to imitation from competitors.

Fig. 2: some examples of the insight map



Business model design

The Business Model Canvas is strategic management tool, which allows to develop and sketch out new or existing business models. It is a visual template pre-formatted with the nine blocks of a business model. The Business Model Canvas was initially proposed by Alexander Osterwalder (2009) based on his earlier work on Business Model Ontology. Formal descriptions of the business become the building blocks for its activities. On the set of ideas selected participants were asked to draw the possible business model to support their service and turn it into a business system capable of generating the expected increase in revenues (Fig. 3). After the fast prototyping of the business model the groups presented it each other and opened a discussion on areas of amelioration or improvement.

Workshop results and managerial implications

On the whole the projected produced 30 different business model prototypes related to services and capable to sustain the expected increases in sales given by top managers as an overall goal for the project. Business model canvases have been collected and clustered in families and were presented to top management for further implementation. Business models dealt with the creation of new services for different customer segments: i) large global companies; ii) small business and industrial districts; iii) retailers and distributors. The different clusters of business models have been created grouping together services that were similar in the concept, served a similar segment of customers or displayed some similarities

in the value proposition and revenue models. The most promising areas of innovation are related to small business and retail. The small business cluster of services is focused on the idea of “mobile open workshops” allowing artisans and small producers to access machineries and assistance without having to buy a machinery that could be used only for a specific production or a small lot. Company would provide technical assistance, machinery set up and run a reservation system on line where customers could ask for consulting on the specific set of machineries needed to perform a specific task. The revenue stream is guaranteed through a pay per use billing model. The service idea generated on the insight that most artisans feel a strong uncertainty about the future and are not willing to invest in new machineries or develop new skills focusing, on the contrary, on day to day activities. This set of services aimed at helping customers create new value for their company, try and experiment new techniques and by doing so help their company to develop a more positive stance towards innovation and production flexibility.

As for as retailers are concerned, the dominant idea was the one of reducing their need of stock and inventory through the digitalisation of their outlet and the digitalisation of many customer relationship processes. The service offered should be the one of an open platform where dealers and retailers could configure their virtual shop and optimise customer services and spare parts assistance. The service designed would work not only for the products of the company but should run as a sort of digital wholesaler or e-commerce platform allowing all products and suppliers to be managed. The revenue model is linked to the site management, consulting and platform promotion and is based on a service fee plus extra price for custom fit services.

In general terms, the results of the workshops were satisfactory providing top managers with not only a set of new ideas but also with different business models to browse providing different options in terms of assets needed, key processes, cost structures, channels of distribution and relationship and revenue models. The future challenge is to reward the work of all the people that took part to these initiatives in order to create a positive environment for future innovation activities. From a corporate culture perspective, the workshops helped the different groups of participants to gain a wider vision of the different roles and functions within the company and to overcome some well rooted dogmas that strongly limited their ability to see an alternative future for the company itself.

Fig. 4: business model prototypes



BIBLIOGRAPHY

Ankenbrand, B. (2011). Collectively staging business models. Pinc Conference 2011. Sonderborg, Denmark.

Bateson, G. (1955). "A Theory of play and Fantasy", reprint. Steps to an ecology of mind, Ballantyne books, new york, 1972.

Bucolo, S. (2011). Design Led Innovation – Synthesising Needs, Technologies and Business Models. Pinc Conference 2011. Sonderborg, Denmark.

Chesbrough, H.M. (2004). Managing Open Innovation, Research Technology Management; Jan/Feb.

Chesbrough, H.M. (2007). Open Business Models. Boston. Harvard Business School Press.

Chesbrough, H.W., Appleyard, M. (2007). Open Innovation and Strategy. California Management Review. Vol. 50,n. 1, Fall.

Christensen, C.M., Raynor, M.E. (2003). The Innovator's Solution. Boston. Harvard Business Press.

Doz, Y., Thanheiser, H. (1996). Embedding Transformation Capability. ICERD, October.

Ehn, P. (1988). Work-Oriented Design of Computer Artifacts. Stockholm, Arbetslivscentrum.

Hamel, G. (2002). Leading the Revolution. Harvard Business School. Cambridge, Mass.

Hanson, W. (2000). Principles of Business Marketing. South-Western College Publishing, Cincinnati, Ohio.

- Lee, C., Vonortas, C.S. (2004). *Business Model Innovation in the Digital Economy*. Idea Group, Inc., New York.
- Magretta, J. (2002). "Why Business Models Matter". *Harvard Business Review*. May.
- Mintzber, H. (1987). *Crafting Strategy*. *Harvard Business Review*, July-August.
- Mintzberg, H., Ahlstrand, B., Lample, J. (1998). *Strategy Safari*. Prentice Hall Europe, London.
- Mitchell, D., Coles, C. (2003). The ultimate competitive advantage of continuing business model innovation. *The Journal of Business Strategy*; 2003; 24, 5.
- Morris, M., Schidehutte, M., Alle, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of Business Research*, 58.
- Normann, R., & Ramirez, R. (1994). *Designing Interactive Strategy: From Value Chain to Value Constellation*. Chichester, Wiley.
- Onetti, A., Capobianco, F. (2005). Open Source and Business Model Innovation. The Funambol case. *Proceedings of the First International Conference on Open Source Systems, Genova, 11th-15th July 2005*. Marco Scotto and Giancarlo Succi (Eds.), pp. 224-227.
- Osterwalder, A., Pigneur, Y. (2009). *Business Model Generation*. Self publishing.
- Polanyi, M. (1998). *Personal Knowledge : Towards a Post-Critical Philosophy*. London, Routledge.
- Porter, M. (1987). From Competitive Advantage to Corporate Strategy. *Harvard Business Review*, Vol. 65, issue 3.
- Rajala, R. (2009). *Determinants of Business Model Performance in Software Firms*. Helsinki School of Economics.
- Schön, D. A. (1983). *The Reflective Practitioner - How Professionals Think in Action*. New York, Basic Books.
- Valeocon (2009). *Business Innovation Roadmap*, working paper.

AUTHOR BIOGRAPHY

Fabrizio Maria Pini is currently marketing professor and head of the marketing department at Mip Business School, Politecnico of Milan and Associate Partner at Orange Network Management Consulting. His professional activity, both as a consultant and an academic, has been focused on: the impact of disruptive changes on marketing strategies and corporate business models; the redesign of marketing models in digital and multichannel environments; co-creation of innovation and business modelling.