Business models as systemic instruments for the evolution of traditional districts?

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2011

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KEYWORDS: Innovation Intermediaries, Market Devices, Collaborative Entrepreneurship

ABSTRACT

This paper aims to explore the potential role of Innovation Intermediaries in the evolution of a traditional cluster toward a service-oriented perspective. In particular, we will highlight the generative function of business models, here as market devices, in stimulating the co-evolution of Intermediary and target firms' strategies.

1 - INTRODUCTION

Recently scholars, practitioners and policy circles focused their attention on an emergent phenomenon in the innovation landscape: the innovation intermediaries and related intermediation functions (Howells, 2006). Although a clear definition of intermediaries is not available yet, we can say that intermediaries are specialised agents, embedded in a system of innovation and focused on the translation of knowledge between different epistemic dimensions (Coeurderoy and Duplat, 2008), governance levels (Klerkx and Leeuwis, 2009), actors (Yusuf, 2008) and networks (Kirkels and Duysters, 2010). While intermediation functions can be fulfilled by private or public organisation, scholars focused their attention the private side of innovation process. Howells in his seminal paper classifies the functions of private intermediaries in UK (Howells, 2006), others analyse the role of innovation brokers for specific sectors (Winch and Courtney, 2007) or in connecting different SME's networks in the co-development of innovation (Kirkels and Duysters, 2010). The main point here is that the emergence of this new typology of actors refers to the creation of a market for technological knowledge, and the solution of related coordination problems. Few studies place intermediaries (and intermediation activities) in a systemic context, where the development of specific strategies impact on system's performances (Klerkx and Leeuwis, 2009, van der Maulen et al., 2005).

Aim of this paper is to explore the potential role of Innovation Intermediaries in the evolution of a traditional cluster toward a service-oriented perspective. In particular, we will highlight the generative function of business models, here as market devices, in stimulating the co-evolution of Intermediary and target firms' strategies. To do so, we will justify the similarities between business models and systemic instruments, highlighting their specificities and uniqueness. The focus here is on specific infrastructures created by the Emilia-Romagna government as part of the renewal process of its innovation strategy. These intermediary organisations are Applied Research Laboratories (LABS) established in the Emilia-Romagna Region. Created in 2004 LABS are composed by universities, local firms and other local stakeholders (chamber of commerce, employers associations, provinces and municipalities). Their aim is to organise, match and steer the regional R&D activities, under the co-ordination of the regional R&D agency (ASTER). More recently, these laboratories gained the administrative and organisational independence by universities and other prominent stakeholders, as basic condition for the access to the regional funding programs. The assumption we further here is that these intermediaries develop specific strategies, and then a specific business model, to fulfil their specific tasks. The unintended (and potential) outcome here is the realisation of a systemic impact on the dynamics and strategies of a traditional cluster, and on its path of revitalisation.

This paper is organised in three main sections. Firstly, we structure a critical review of the literature on innovation intermediaries and business model research. The section closes with the proposition of an analytical framework for the definition of the dynamics and impact of

business models' deployment. Secondly, we offer an introduction to the background of the Emilia-Romagna regional strategy and plan for the upgrading of its regional system. The last section deals with the presentation and discussion of a case study regarding the design process for the development of new business models for the machine tool sector. Finally some conclusion will be offered in order to highlight the possible definition of business models as systemic instruments for the evolution of traditional clusters.

2 - THE RISE OF INNOVATION INTERMEDIARY ORGANISATIONS

Historically the role of intermediaries can be traced back to the role of middlemen in 16th century Britain (and United States in the 17th), providing information for the use and diffusion of new technologies for the agriculture and textile industries (Howells, 2006, Chandler, 1977). Their role has been fundamental in defining the efficiency and effectiveness of production processes in newly manufacturing sectors. With the passage form a scattered system of production (i.e. putting-out) toward a modern industrial system, the importance of innovation intermediaries declined (Freeman, 1995, Lipsey, 2009). Their role has been internalised as an outcome of centralised organisational structures (i.e. structural innovation - cfr.Chandler, 1977) and the definition of managerial functions (Barnard, 1968). Only with the demise of the so-called linear model and the rise of a distributed innovation processes, intermediary functions came back to the forefront. Howells relates the emergence of innovation intermediaries to different stands of the innovation literature, such as: (a) studies on technology transfer and diffusion; (b) the literature on technology management; (c) the development of the innovation systems concept; (d) the research into Knowledge Intensive Business Services (Howells, 2006). Other authors pinpoint how the development of R&D outsourcing practices highlight the importance of intermediary's functions in the technological and innovation processes (Piller and Ihl, 2009).

2.1 - Innovation Intermediaries: Definition and Rationales

Although a clear definition of intermediaries is not available yet, we can say that intermediaries are specialised agents, embedded in a system of innovation and focused on the translation of knowledge between different epistemic dimensions (Coeurderoy and Duplat, 2008), governance levels (Klerkx and Leeuwis, 2009), actors (Yusuf, 2008) and networks (Kirkels and Duysters, 2010). Innovation intermediaries can be defined according to different standards or reference. Surveying the literature, we propose three different classification systems here, based on a) the definitions of intermediaries, b) their active of functional role and c) their organisational status.

The recent literature renders two broad concepts of innovation intermediaries: functional and relational. The functional perspective highlights specific quality or ability: brokering, gatekeepers and boundary-spanning organizations (Youtie and Shapira, 2008, Howells, 2006). According to this perspective Innovation Intermediaries can be defined as *"an organization or body that acts an agent or broker in any aspect of the innovation process between two or more parties"* (Howells, 2006:720). Beside this we have, a relational perspective highlighting the multi-level and multi-actor capabilities displayed by intermediaries. Here intermediary organisations "*are defined by their structural position, namely 'intermediary' is any organization that mediates the relationship(s) between two or more social actors (organizations, institutions etc.)*" (van der Maulen et al., 2005:3). Here we

have the juxtaposition between intermediaries' agency and function in a system stressing their active or passive role.

We can distinguish a second classification's rationale highlighting the topic of intermediaries' role. This rationale could be synthesised along a static/dynamic continuum, and used to classify their behaviour in different periods and situations. Intermediaries could work here to promote or hinder the diffusion and application of specific information and, therefore influencing the shape of institutions and standards (Garud et al., 2007, Sorenson et al., 2006, Garud and Karnøe, 2003). This helps to put forward the evolution of intermediaries' propositions according to path dependant trajectory. On the other hand, the introduction of time dimension, stresses their adaptive behaviour and the proposition of different varieties.

As the term implies, Intermediation functions can be fulfilled according to different organisational status: internal and external to a specific organisation (Daziel, 2010). As the role of innovation became a central topic in defining the performance of organisations (and systems), the definition of intermediation practices renders the antithesys between emerging and normative organisational rationales. Intermediaries here have been established as independent bodies to tackle market failures in the circulation and diffusion of technological knowledge (Bozeman, 2000, Smits and Kuhlmann, 2004) or as an emerging feature of a changing division of labour between actors in different systems (Coombs et al., 2003, Howells, 1999). This literature in generally routed in the network/system paradigm and focuses on intermediaries' expected outcomes and/or specific processes. Examples of internal intermediary are: Technology transfer offices in universities or specific R&D departments in big companies. External intermediaries can be private or publicly owned too and generally can be defined as Contract Research Organisation (C-RTO) or as Knowledge Intensive Business Services.

2.2 - Intermediaries: new actors in Innovation Systems?

Some recent contributions analyse how the Innovation System's rationale, (i.e. Regional Innovation Systems), has been proposed as standard of reference for the design and evaluation of public intervention programmes, according to a normative and prescriptive assumptions (Uyarra and Flanagan, 2010). They observe how traditional STI policies are normally a-spatial and their effect on different spaces and territories could be mediated by the strategies of regional actors (their agency) or structural characteristics of the regions (Uyarra and Flanagan, 2010, Strenberg, 1996, Pollock and Williams, 2010). This perspective focuses on the expected outcomes of intermediaries at systemic level, highlighting the dynamic and active role of intermediaries as new agents in a system of innovation. This can be achieved by a transformation of the organisations already existent (Winch and Courtney, 2007) of by the creation of specific ones (Lopez-Vega, 2009, Koschatzky and Stahlecker, 2010, Laranja, 2009).

Focusing on the public (or public oriented) intermediaries, we can survey a variety of organizational arrangements and institutional settings. Some examples are the Co-operative Technical Organizations (CTOs) (Winch and Courtney, 2007), Institutions of Technological Infrastructure (ITIs) (Koschatzky et al., 1996); research alliances and other forms of strategic partnerships (steered by public policy programmes), such as the manufacturing extension programmes in the United States (Shapira, 2001, Hagedoorn et al., 2003). In analysing the potential role of business models as systemic instruments for the evolution of traditional clusters, our attention will be on specific external intermediary organisations (C-RTO) established in a regional system of innovation (Emilia-Romagna) from a dynamic perspective (Business Model Design). A broad definition of Research Technology Organisation (RTO) could be *"publicly or partly publicly financed research institutes that contribute either directly or indirectly to systems of innovation" (Preissl, 2006:133)*. Other authors prefer differentiate between RTOs and *Contract* RTOs (C-RTO), to specify their contractual (or market) orientation (Howells, 1999). The frequent involvement of Universities and other research institutions as stakeholders in public oriented intermediaries is an evident outcome of the prominence, assigned by public actors, to the exploitation of scientific knowledge. Private intermediation, on the other hand, relies on a wider array of knowledge bases accessed, normally, according to contractual/relational logic.

However, the idea of an evolution of intermediation activities toward an entrepreneurial or proactive stance seems to be a common, emerging trend. We offer some evidence from recent literature to support this claim. Firstly, we have the competition between public and private intermediaries (mostly KIBS) for the provision of similar services to firms and public institutions (Viljamaa et al., 2010). Secondly, we have the emergence of new organisational structures for the provision of intermediation services, through the development of newly Public Private Partnerships (PPP) between Universities and firms (Koschatzky and Stahlecker, 2010). However, this trend does some consequence. Public oriented intermediaries seem to have lost their "neutrality" in relation to specific "core-functions" (e.g. technology sourcing, gate-keeping, facilitator). If University's Technology Transfer Offices behave as institutional entrepreneurs, to influence the diffusion of specific technologies (Jain and George, 2007), this trend raised concerns about the neutrality of research activities and their exploitation processes (Nottenburg et al., 2002).

Summarising we can say that there is an ongoing process of division of labour at work here. This process is governed by the rationale of competition, commanded by the development of specific markets of by the delivery of specific innovation programs. And finally, that the proposition of clusters as one prominent tools for the management of industrial and innovative dynamics, implies the development of business like behaviours among public or publicly oriented intermediaries (Carlsson, 2005, Hagedoorn et al., 2003). Regarding the innovative outcome of these activities, their aim is to transform the concept of proximity in a superior innovative output (Uyarra and Flanagan, 2010). However, if the "thickness" of the system is important other aspect have been proved relevant here: a) the quality and dimension of the

regional knowledge base (Cantner et al., 2010) and, with specific reference to manufacturing activities, b) the innovation strategies of single firms (Kalafsky, 2006a, Kalafsky, 2006b) and the complementarities between intermediaries and industrial knowledge bases (Vega-Jurado et al., 2008).

3 - BUSINESS MODELS: Review and Classification

The increasing number of publications point out how Business Models (BM) has become an "hot topic" in the field of business and entrepreneurial studies (cfr. Baden-Fuller et al., 2010 - Special Issue Long Range Planning). We offer here an analysis of the literature to highlight some prominent trends and issues on BM: the search for a common definition and their contextual/dynamic nature. The BM's path to stardom begins at the looming of the "dot.com" era, as a buzzword in use among investors, financial analysts and other professional to summarise the "way of doing things" specific to a business. Since then, several scholars tried to define BM according to their own perspective (Osterwalder et al., 2005, Makinen and Seppanen, 2007, Morris et al., 2005). Recently, the focus shifted to a critical analysis of the literature produced in order to converge on common points such as definition, functions and roles. Here the literature is divided between academic and practitioners'' perspective. A recent study on the perception of BM in the business community tries to reach a synthesis thanks to a discourse analysis on BM practices. Here, the dominant logic for BM is their capability to enact a commercial opportunity, three main rationales (or dimensions) seems to emerge: a) importance of the resource specificities and their organisation; b) the relational/contractual dimension as enabling factor; c) the BM as a precursor for sense making (cfr. George and Bock, 2011). The second position reported here, deals with the dynamic and contextual perspective on BM, emphasising their evolutionary properties. Business models have been described as a tool leading the evolution and adaptation of businesses to their context (Demil and Lecocq, 2010, McGrath, 2010), as a system of relations channelling feed backs and connecting the strategic and the tactical levels (Casadesus-Masanell and Ricart, 2010) and influencing the process of structural change, proposing new actors and agencies (Teece, 2010, Gambardella and McGahan, 2010). Finally we have an analysis on the intrinsic knowledge dynamics related to the emergence of BM as a market device (Doganova and Eyquem-Renault, 2009).

The theoretical discourse on BM bears to some commonalities too. Teece proposes a list of drivers related to this topic: (a) the emerging of the knowledge economy; (b) the importance of ICT in the creation an delivering of value to customers; (c) the re-organisation of the industrial production by outsourcing and off shoring strategies; (d) the rise of services accompanying the industrial's structural change (Teece, 2010:4). At first glance it is clear how the rise of BM is actually grounded in the contemporary industrial and economic landscape. On the other hand, this justifies the flourishing of classification and taxonomical schemes proposed in the last decade. Baden-Fuller and Morgan offer an interesting perspective in questioning the usefulness of BM generalisations. They observe how BM operate at an "*intermediate level*" between description and abstraction, assuming an intermediary role between theoretical and applied landscapes: "*as practical models of technology that are ready for copying, but also open for variation and innovation*" (Baden-Fuller and Morgan, 2010:157). This conclusion seems to be supported by the literature produced. If we think at

BM as structural/organisational models, the example proposed by Oswelander regarding the "meta BM", defined as *"an abstract concept that allows describing what a business does for a living"*, seems to "fit the bill" (Osterwalder et al., 2005:10). On the other hand, this idea indirectly refers to other interesting topics such as the issue of routine inheritance and replication dynamics, in their relationship with firms' performance and organizational dimensions (Winter and Szulanski, 2001).

This introduces the last unifying point on BM: the dynamic perspective. Demil and Lecocq summarise this position as a *"transformational approach, where the BM is considered as a concept or a tool to address change and focus on innovation, either in the organization, or in the BM itself"* (Demil and Lecocq, 2010:228). This perspective highlights the importance of the successful adaptation to a specific (dynamic) environment and the systemic interdependence between different actors and governance levels. The entry points for this kind of analysis are different such as the construction of the value proposition (Teece, 2010, Chesbrough and Rosenbloom, 2002), the learning dynamics induced by the adaptation process (McGrath, 2010), the boundary spanning and translational role of BM's related processes (Zott and Amit, 2008, Doganova and Eyquem-Renault, 2009).

The elaboration of this transformational approach introduces to a translational role of business models, aiming to legitimise the action of a single actor in a complex system of interdependencies. This perspective proposes an interesting review on BM studies organized according to three streams of analysis (Doganova and Eyquem-Renault, 2009). The first, leaded by the research community, defines business models thanks to its relations to the firm, its functioning and purposes, and relies on an "essentialist" stance. However, this search for a unique definition able to blend epistemic and structural dimensions of a business model is still in its prime, as the different contributions provide more questions than answers. At this stage is not possible to understand if this "mode 1" research stand is the correct one, as the position of this concept in the disciplinary landscape is still unclear (Morris et al., 2005, Makinen and Seppanen, 2007). The second position, aims to clarify nature and content of business models, is expression of a "functionalist" perspective. Object of analysis are the functions and problems that business models help to describe and unravel when used as a strategic tool. This perspective can be defined as a "mode 2" research program, because it tries to reach useful insights and knowledge from the observation (and scrutiny) of a complex reality (Chesbrough and Rosenbloom, 2002, McGrath, 2010). Finally, we have a "pragmatic" perspective according to which, business models can be conceived as market devices (Doganova and Eyquem-Renault, 2009, Muniesa et al., 2007). According to this perspective, business models are analysed according to an Actor-Network Theory perspective in addressing (and shaping) a problem solving heuristic. The specific theoretical framework here is then included in a critical appraisal of the reality, aiming at gain useful knowledge while explaining the emergence of consistent institutions.

In Figure 1, we try to summarise the different perspectives on BM according to an epistemological classification proposed by Callon (Callon, 1989). On the columns we have the passage toward a multidimensional and social dimension in the development of knowledge, represented here by the introduction of Polanyi work on tacit knowledge and knowing (Polanyi, 1958). On the other hand, the rows represent the different use of the knowledge produced. Here we contrast the normative, unchangeable nature of knowledge produce by Mode1 and ANT paradigms, against the challengeable perspective presented by a Mode 2 perspective. In the table we present a classification of the different perspectives introduced by (Doganova and Eyquem-Renault, 2009), to which we add a systemic perspective, branding BM as Systemic Instruments (or tools).

Figure 1 - Business Model Conceptualisation

KNOW. STRUCT → **KNOW. NATURE ↓**	**One-dimensional** **(Pre-Polanyi)** **Rationale*: Specialisation, Organisation***	**Complex** **(Post-Polanyi)** **Rationale*: Translation, Meaning***
Normative ***Reality is immutable Science reflects this structure.***	**ESSENTIALIST PERSPECTIVE** Theory Based – Mode 1 BM as Blueprint (intelligent design)	**PRAGMATIC PERSPECTIVE** Object Based - ANT BM is a By-Product
Discursive ***Reality is complex (institutionalisation)***	**FUNCTIONALIST PERSPECTIVE** Practice/Output based – Mode 2 BM embodies set of relationships	***SYSTEMIC PERSPECTIVE*** Process Based – Discursive BM is a systemic tool
Our adaptation from: (Callon, 1989, Doganova and Eyquem-Renault, 2009, Polanyi, 1958, Polanyi, 2000)		

This classification stresses a trend already appreciable in the literature discussed up to now. BM studies progresses form a close to an open perspective, in which the BM knowledge (regarding their nature, meaning and components) is contested between different branches of science (essentialist perspective) or among an enlarged community of users/practitioners (as in the case of market devices). The outcome of the essentialist and pragmatic perspectives is normative in nature; the aim is to produce “standards” regulating specific typologies of exchanges (e.g. according to mertonian and market norms respectively). On the other hand, we highlight the emergence of another dynamic here, where knowledge nature is contested and closure is agreed among different epistemic communities. Callon talks about networks of extended translations where knowledge is produced in a circular and discursive manner (Callon, 1989:52). Common statements are agreed among network participants in order to regulate the production of scientific statements and therefore grant a steady, although temporary, reproduction of knowledge. The difference between functionalist and systemic perspective here is in the nature of the participating actors and in the permeability of the networks established. According to the functionalist logic, these aspects are agreed at the beginning (i.e. business models can be produced in specific contexts by a selected population). The systemic logic, the context and initial conditions play a central role in defining

who and according to which logic a business model can be produced and, where the business models can be applied and understood is a matter of understanding. What in a context regulate the market exchange and the value (or price) of an object (i.e. between firms), in other contexts the same behaviour can be appreciated according to a different logic (i.e. division of labour and specialisation characterising a process of structural change).

4 - BUSINESS MODELS AS SYSTEMIC INSTRUMENTS.

Systemic Instruments are a topic relatively new to the policy innovation arena, although relying on a strong tradition in policy studies. We highlight here some issues justifying their adoption among the innovation community: the problem of fragmentation of policy arena and connected problems of governance; the management and evaluation of performances, the co-evolution of policy and practices steered by the ability to learn and adapt (Howlett, 2009, Talbot, 2005, Kuhlmann et al., 1999, Mytelka and Smith, 2002). Policy instruments then emerged as a common field of interest to design, manage and pace the evolution of systemic contexts (Howlett, 2000, Smits and Kuhlmann, 2004). We can distinguish here two main rationales for the deployment of public influence. The first based on the administration of public power, according to the concepts of independence and substitutability. The second generation develops along the concept of governance and co-ordination, dealing with problems of specificity and complexity (Howlett, 2005).

Smits and Kuhlman introduced systemic instruments in the discourse on the governance of innovation systems, with the aim to define new ways to maximise the impact of public policies on complex systems. The rationale for the adoption of a systemic perspective is organised according to three major trends characterising the evolution of innovation processes and systems: a) the interconnected nature of the innovation processes, b) the rise of systemic approaches in the innovation theory and c) the importance of intelligence and learning practices in designing and assessing specific innovation strategies (Smits and Kuhlmann, 2004). The application of systemic instruments in the fields of sustainability and regional innovation furthered the evolution of this concept. In sustainability studies systemic instruments can be defined as *"methods and mechanisms used by governments, political parties, businesses or individuals to organise, coordinate and direct innovation systems"* (Wieczorek et al., 2010:16). The major shift here regards the nature of power: not only public institutions but even individuals and business can use systemic instruments. The validity of this observation seems to be confirmed by some recent contribution on regional STI policies. Here the development of specific policy mix for in delivering regional innovation policies comprises traditional and systemic instruments for the creation of a favourable institutional environment. These approaches normally emphasises the importance of the "institutional thickness" and related institutional framework, composed by private and public actors: the issue of coordination is on the forefront here (Laranja et al., 2008:828).

According to Elidas, Hill and Howlett, systemic instruments are specific and unique. Specificity implies that systemic tools aim to solve particular issues, while uniqueness implies not substitutability between instruments (McDonald, 2005, Eliadis et al., 2005, Howlett, 2000). We argue that business models, according to their systemic perspective, can be defined as systemic tools because they display specific and unique features toward the governance of territorial sub system of innovation (i.e. clusters). This because they represent the processes followed, the structure of relationships and resource employed by private firms in their activity.

The specificity of business models is characterised according to three points: 1) they can be considered as a constitutive characteristic of innovation system ontology (or polity); 2) they render the dynamic specialisation process for specific problem-solving networks, 3) they contribute to trace the emergence of common rules and routines between micro and meso dimensions.

On the other hand, cluster policies can be defined as an application of systemic instruments to the governance of territorial agglomeration's dynamics, occurring in specific socio-technical contexts (Werker and Artheye, 2004, Smits and Kuhlmann, 2004). Pacing the discourse on regional innovation studies, the topic of systemic instruments moves away from the exclusive dominion of public policies. In particular, the presence of specific bundling of procedural and systemic instruments (e.g. innovation policy mix) represents a structural feature of a specific territorial configuration (Uyarra, 2011, Uyarra and Flanagan, 2010). Summarising, if the role of systemic tools is to solve a problem of coordination between system's agents, they can be defined by "a organised system of relationships connecting one or more typology of agents and aiming at steer the division of labour by mutual learning practices". This definition stresses the generative role of knowledge dynamics in steering the system's structural change, attained by a progressive generation, circulation and consumption of knowledge. Moreover, this perspective testifies about a shift in regional policies rationales, in which territory is not ore an "empty vessel" to fill with policy contents and the representative agent looses its explanatory power (Garofoli, 2002).

As mentioned in the previous section, business models address an important role at firm level, guiding the process of learning, discovery and specialisation (Demil and Lecocq, 2010). This feature is particularly important in the understanding of innovation systems' dynamic. Traditionally the literature on this topic emphasised the concept of interdependency and collective effort prioritising the systemic traits (in term of fixtures) over the dynamic concept related to innovativeness. Innovation systems has been considered as a collection of biotypes of different institutions, characterised by their technological or knowledge specialisation, or as a canvass to which policy makers could refer in designing specific interventions (Smits and Kuhlmann, 2004:9). Here learning was primarily related to the translation of knowledge from scientific to the industrial context, the networking aimed at facilitates the access to specific information, and the systemic functions assured by the intensiveness of cooperation between actors. Actually, this rationale is not far form the traditional linear model of innovation (Godin, 2009, Godin, 2006, Balconi et al.). A recent contribution stresses the knowledge and structural dynamics implied in the innovation process (Metcalfe et al., 2005), where *"innovations result from a process of accumulation of knowledge that unfolds stepwise in a largely path-dependent fashion within a design space defined by the perception of the problem at hand"* (Consoli and Mina, 2009:310). Problem solving here is an open-ended process that, in turn, contributes to the solution of specific problems and challenges the borders of specific knowledge networks. Business models here can be defined a system of relationships characterised by internal and external consistency. With internal consistency,

we refer to the translation of strategies into tactics. With external consistency, we refer to the way in which the actor is able to define select and coordinate the different sets of stakeholder, functional to the realisation of its aims (Teece, 2010, Doganova and Eyquem-Renault, 2009).

The development of a common understanding and its contextual nature represents the conceptual basis for discussing the potential role of business models from a policy perspective. We argue here that the potential value of specific business models, according to their structural, systemic and strategic perspective, can be used as systemic instrument enhancing the learning capabilities of public actors. With particular regard to the field of innovation policies, the topic of policy learning has been tackled according by specific evaluation tools (Georghiou and Roessner, 2000, Georghiou, 1998). With the aim to provide useful insights and appropriate information for the formulation and delivery of proper policy intervention, the issue of systemic intelligence come to the forefront, reflecting the increasing complexity of the systems in object (Kuhlmann et al., 1999, Kuhlmann, 2001). More recently, the establishment of cluster policies as an important concept for public intervention on innovation and industrial contexts, introduced the issue of evaluation (Schmiedeberg, 2011). The specificity of business models can be seen here according to their specific representation of ongoing processes and as emerging ontological dimension. This perspective highlights the importance of meso level as specific context for comparing and scrutinising the evolution of socio-technical systems and networks (Elsner, 2008). On the other hand, the topic that business models could contribute to is the innovation in public policymaking and the possibility to experimentation and learning (Elsner, 2010, Potts, 2009). In this perspective the role of business models developed by a specific group of firms and other connected organisations (i.e. Innovation Intermediaries) could provide an useful insight on the ongoing system's innovation processes (Niosi, 2002). Moreover, this kind of analysis can help to unravel the value of entrepreneurial actions according to its multilevel and multiactor nature (Breslin, 2008) and in appreciating the impact of these activities under different lights and theoretical perspectives (A. Cuervo et al., 2007).

Figure 2 - Business Models Matrix
(our elaboration on: George and Bock, 2011)

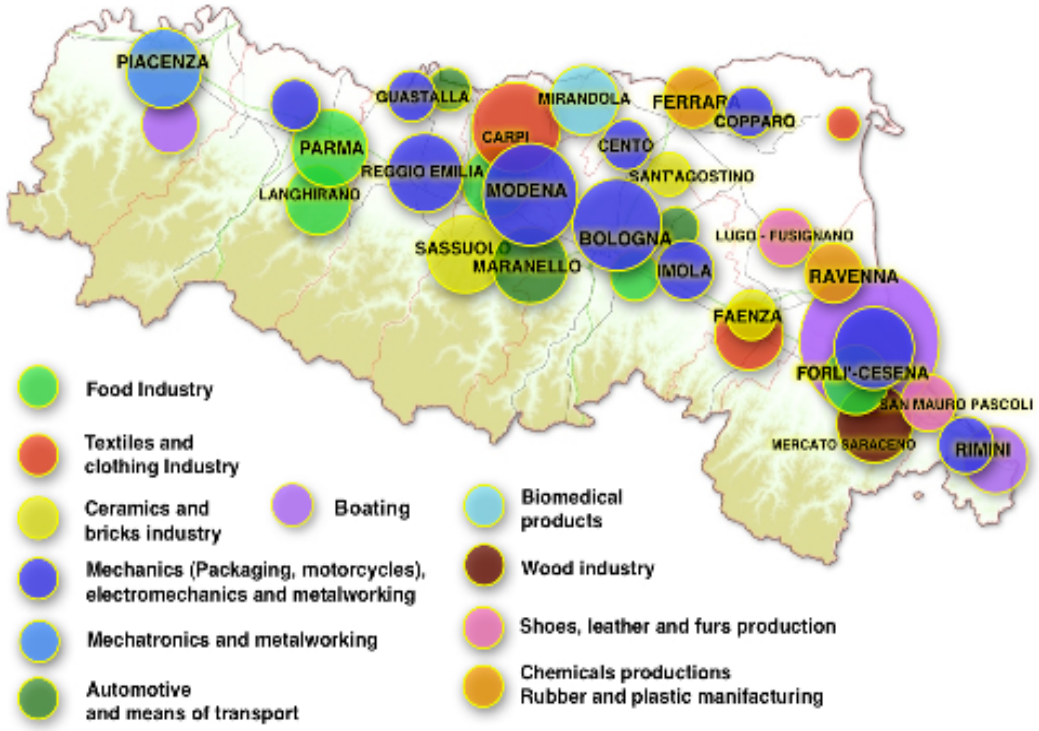
		BM REPRESENTATION	
		OBJECT	**PROCESS**
IMPACT	**BUSINESS**	Structure and Organisation Knowledge Base Product Architecture	Relationships and Contracts Boundary Spanning Capabilities Hybrid-Offering
	SYSTEM	Value and Performances Strategic Partnerships	Constituency building Legitimisation Systemic Intelligence

In Figure 2, we try to summarise the concept of BM as systemic instrument. The logic here is organised according to the nature of BM (columns) and their possible impact on firms and systems (rows). If we conceptualise BM as a static object, a snapshot describing the behaviour of a single actor in the deployment of its strategic intent, the expected outcome can be defined according to the resource based view of the firm and its relationship with value creation according to the specific network firm's is embedded in. According to George and Bock, this perspective deals with the measurement (or appreciation) dynamics relating to firm's performance (George and Bock, 2011). On the other hand, the dynamic and evolutionary perspective (right column) focus on the learning processes involved in the system of exchange and relationships needed to attain a specific objective. This stance builds on the idea of BM as tool leading the firms' adaptation process (Demil and Lecocq, 2010, McGrath, 2010), as a process translating strategic aims in actions (Casadesus-Masanell and Ricart, 2010). Moreover as a complement to the static definition on BM these dynamics highlight the emergence of new agents and agencies in a complex system (Dopfer and Potts, 2008). An interesting point here is the relationship between an important stream of literature on entrepreneurship, according to a process perspective (Morris and Lewis, 1994) and the recent literature on the evolutionary nature of this phenomenon (Veciana, 2007, Breslin, 2008, Metcalfe and Ramlogan, 2005). Summarising, conceiving BM as systemic instruments could be an interesting perspective for three main reasons: a) exploring the entrepreneurial phenomenon from an evolutionary perspective; b) modelling the behaviours of specific agents highlighting the topic of agency; c) gain a better understanding about the social and knowledge dynamics commanding the ongoing division of knowledge.

5 - CASE STUDY BACKGROUND

Located in the Northeast of Italy, Emilia-Romagna is one of the wealthiest regions in the country. With a surface of 22,000 sqkm, Emilia-Romagna population reaches 4,432,439 inhabitants (11,3% of which are foreigners). In its nine provinces are localised 383.549 firms, characterising the industrial profile of this region according to their industrial specialisation (ISTAT 2009). Traditional sectors are still at the core of Emilia-Romagna's economic activity, manufacturing accounts for the 30% (circa) of its GDP. Beside the Agri-Food district in Parma, we have the car and tiling clusters near Modena and Reggio-Emilia, the Packaging District of Bologna and the newly emerged Biomedical district in Mirandola[1].

Figure 3 -Emilia-Romagna Region (source www.investinemiliaromagna.it)



Emilia-Romagna enjoys a diffused system of research and innovation. The presence of seven Universities (one private) and the research laboratories of CNR (National Research Council) and ENEA (National Agency for New Technologies, Energy and the Environment), the two national research institutions, constitute a specific trait of this region in the Italian landscape. Beside the specialisation of the research activities (67% of researchers works on science, technology ad engineering), the distribution of research institutes in the region represents a real asset. As for other regions, Emilia Romagna's research potential is organised around the Universities, and other research institutions. In total the researchers form the universities are 6,711 plus1,500 circa from CNR and ENEA institutes localised in the region

[1] In 2007 on a population of 421,906 units, the ones with less than 10 employees were 395,716 (93.86%).

Since the publications of Brusco in 1982, the Emilia-Romagna model became one of the most cited examples to explain the socio economic development of the so-called Third Italy (Brusco, 1982, Cooke, 1996, Rinaldi, 2002). The reason of this interest can be summarized according to structural and socio-economic considerations. The first topic deals with the peculiar structure of the production system and the capability of the Italian SMEs to cooperate in order to compete at national and international level as a single productive cycle (Piore and Sabel, 1984). Regarding the Emilia-Romagna case Brusco highlights the development of traditional artisan sectors and the definition of sub-contracting practices (Gagliardi et al., 2007). The second topic characterise the intermediary role of regions under the constraint of a limited power of intervention. In managing the relationship between industrial peripheries and central government, regions create specific governance systems. At the core of this model there is the creation of regional agencies, adopting different operative models: financial model (Lombardy, Lazio and Tuscany) and an operative model (Emilia-Romagna and Marche) (Bellini et al., 1990). In 1973, Emilia-Romagna established ERVET[2] (Regional Agency for the Economic Enhancement of the Territory), a holding company with the specific task to leverage the impact of regional economic and industrial policies.

While ERVET´s mission and remits evolved during the 1980s and 1990s, the governance system of this agency has always been defined by the inclusion of relevant public and private actors (e.g. business associations, financial institutions, banks and chambers of commerce). On the other hand, ERVET's modus operandi is characterised by the development of a specific network of service centres conceived for the provision of "real services" to the local production systems (Maccani, 2004, Bellini, 2000, Bianchi and Bellini, 1991). In the second half of the 1990s (L.59/97), Italian regions faced process of progressive devolution concerning a wide set of competences. With the modification of the Italian Constitution (Constitutional Law 3/2001, art. 117), Research Technology and Innovation (RTI) policies are now part of the regional responsibilities. Emilia-Romagna approached this new mission according to its distinctive characteristics. Aiming at the fulfilment of Lisbon Strategy's objectives, the regional government engaged the regional research system in a regional network for the applied research and technology transfer (Regional Law 7/2002). Important operative outcomes of this initiative have been the establishment of a regional agency for applied research and technology transfer (ASTER) and the definition of a regional RTI program (PRRIITT). Mission of this agency is to promote the cooperation between the regional government and the universities in Emilia-Romagna, by a set of coordinated activities. On the other hand, to build the competitive advantage of the region on the knowledge economy principles (Lisbon Strategy), calls for wide policy platform. With the "Patto per la qualità dello sviluppo e la coesione sociale" (Pact for the quality of economic and social development) signed in 2004 steered the cooperation between institutions and civil society for the sake of regional economic advancement (cfr. Gagliardi et al., 2007).

[2] Regional Law n. 44 of 18/12/1973

The combination between industrial, scientific and territorial processes is at the core of Emilia-Romagna's innovation strategy. Since 2004, one important activity of ASTER has been the establishment (and coordination) of the regional network for the applied research and technology transfer (High Technology Network - HTN). It is organised according to six thematic platforms and composed by Research Laboratories, Technology Transfer Centres and Technology Parks. Research laboratories (LABS) represent the way in which universities engaged with industries and local institutions. Thy can be defined as Contract Research and Technology Organisations (C-RTO). Characterised by a variety of organisational, institutional and governance models, their mission is to match the Universities' research activities according to the need and strategies expressed by local production systems. The process followed by the region (and ASTER) is marked by specific initiatives.

Table 1 - Evolution of Regional Innovation Policies

PERIOD	INITIATIVE	DESCRIPTION	ACTORS	AIMS
		INSTITUTIONAL		
2001/13	SPINNER	Global Grant[3] for the creation of new firms and technology transfer processes	Alma Mater (Uni. Bologna), Sviluppo Italia, ASTER	Mobility of researchers, Exploitation of research results funded by ESF though the Global Allowance. Engage Universities
2002/2004	Regional HTN	Regional High Technology Network	Universities, Local Firms, ASTER	Organise Emilia-Romagna's technology intermediation system.
2004	HI-MECH	Technology District nester in the Regional High Technology Network	ASTER, Universities, Local Firms	Creation of a Technology District co-financed by the National Ministry of University and research
2010	Technopoles	Creation of common infrastructures: 10 Technopoles)	ASTER, Region, Local Institutions, Universities	Streamline the regional research potential. Grant fair condition s of use and access to the regional research infrastructures.
		OPERATIVE		
2003/07	First Call PRRIITT	PRRIITT is a complex program for the implementation of the Regional Law 7/2002.	ASTER, Firms, LABS	Finance the co-operation between local firms and HTN
2007	Second Call PRRIITT	PRRIITT is a complex program for the implementation of the Regional Law 7/2002.	ASTER, Firms, LABS	Finance the co-operation between local firms and HTN
2010	From Production to Technology Districts	Special call co-sponsored by Ministry of Industry	ASTER, Region, LABS, Local Firms	Enhance the cooperation between leading players and HTN
Our elaboration on (Bianchi and Labory, 2011)				

The evolution of regional policy actions is summarised in Table 1. The actual situation accounts for 10 Technopoles established between the end of 2009 and the beginning of 2010. They are infrastructures meant to host and organise all the regional industrial research infrastructures. The major change observed here, has been the realisation of the importance,

[3] A Global Grant is a specific instrument for the mobilisation of European Structural Funds that delegate to an intermediary organisation the implementation and management of a specific plan (cfr. http://ec.europa.eu/regional_policy/sources/docoffic/vm20002006/chap4_en.htm, last access, 17 July 2011). SPINNER is a consortium acting as Intermediary Organisation on the Emilia-Romagna Operative Plan ESF, action IV (human capital)

at least in term of funding opportunities and engagement with local partners, of this program by universities and other public research institution. The Regional Government ‘s action, once very much active in the engagement with the regional research community, is now directed to the coordination of the network according to a specific agenda highlighting. The main points are:

1. The access by local firms to infrastructures and equipment hosted in the Technopoles
2. The standardisation of the LABS’ operative procedures and quality standards
3. The enhancement of the cooperation inside the technology platforms
4. The design of common marketing tools for the network
5. The creation of a monitoring system

All these activities are managed by ASTER as part of its statutory objectives. Their realisation is planned as follows. The Points 1,2 realised through the definition of a mandatory certification process and standards, for all laboratories and centres of the network. The points 3,4 are delegated to specific network activities inside each platform (i.e. development coordination of projects for new products, common marketing activities and initiatives). The last point deals with the development of a monitoring system appreciating the autonomy level (operative and financial) of each platform.

6 - NEW BUSINESS MODELS DESIGN FOR THE MANUFACTURING SECTOR

Profiting from a real case study, regarding the design process of innovative business models for manufacturing SMEs (Cocchi, 2011), our contribution will highlight how this process impinges, in turn, on the nature of the intermediary and on the innovation strategies of manufacturing SMEs. The evolution of Innovation Intermediaries, as discussed previously, is meant to sign a passage from a reactive (or stewardship) position to a more proactive (or entrepreneurial) one. We think that this role could be explored by the analysis of the intermediary's BM, an aspect that seems to be largely unexplored. The second point, explores the possible impact on manufacturing firms. Following the adoption of a new perspective, quite different from their usual approach to innovation, these firms are encouraged to approach the enabling aspects of technologies and practices already in adopted in other sectors. The case in object relates to a pilot experiment aiming at design and presents a new business concept to a local cluster of manufacturing firms (machine tool producers). As the project is still ongoing, we can offer only preliminary conclusions based on the first part of the process.

6.1 - New Business Models in Manufacturing

In the last two decades, New Business Models (NBM) in manufacturing sectors and related product processes, have been introduced according to a Product Service System (PSS) perspective. Defined as "a marketable set of products and services capable of jointly fulfilling a user's needs" (Goedkoop et al., 1999:111), PSS represents the main organisational and operative framework adopted by manufacturers to define, design and implement a unique value proposition. The logic underpinning this prerogative is known as Hybrid Value Creation (HVC), defined as: *the process of generating additional value by innovatively combining products (tangible component) and services (intangible component)* (Velamuri et al., 2011:4). The impact of PSS on manufacturing processes can be appreciated by the variety of terms adopted to describe it: soft products, total offers, through life solutions, and service 2.0. According to the literature, four main drivers underpin the introduction of PSS in manufacturing (Isaksson et al., 2001). They are:

1. the introduction of new regulations, specifying limits and standards on users and suppliers along all the products' life cycle.
2. the increasing competition induces producers and suppliers to differentiate their offerings (by the introduction of services).
3. the progressive adoption of total const of ownership and total life-cycle costs as standards for the products' selection.
4. the increased variability of demand, induces the adopt hybrid solutions to manage markets' discontinuity.

The outcome is a process of progressive “servicisation” of traditional sectors, revolving on the dyadic relationship between technology contents of products and processes and the new importance of clients and services for value generation and profitability. To assist this passage, a quantity of literature and analysis has been produced, highlighting possible methodologies to assist the transition and challenges to be solved (Vladimirova et al., 2011, Biege et al., 2011).

Figure 4 - PSS Classification
(source: Tukker, 2004)

Value in Product	**PRODUCT-SERVICE SYSTEM**			**Value in Service**
	Service (intangible) / **Product (Tangible)**			
Pure Product	**Product Oriented**	**Use Oriented**	**Results Oriented**	**Pure Service**

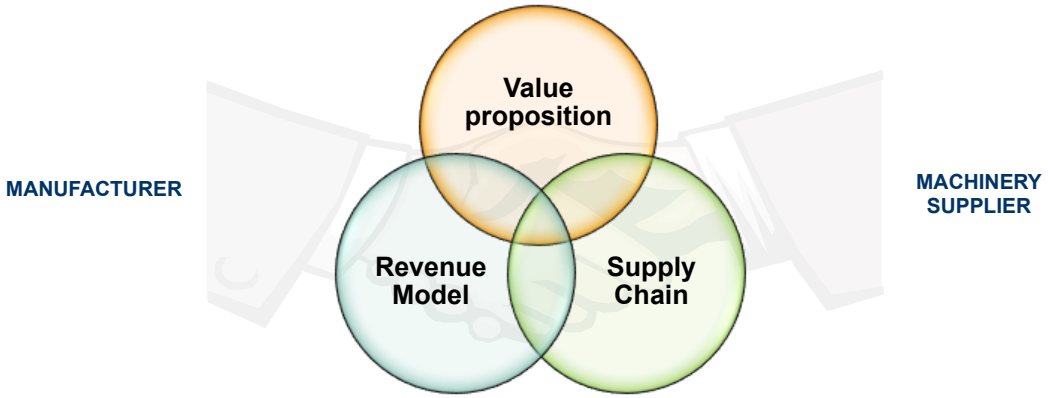
From Figure 4, we can observe how the PSS is generally based on a product-centred perspective, where services follow a “reverse-life cycle” logic (Barras, 1986). This antithesis between material and immaterial offering’s components, seems to be a common logic guiding the “non technological” innovation in manufacturing processes (Gallouj, 1998). The demand of industrial sector focused primarily on the restructuration of supply chains organisation, in turn, to counter the emerging market dynamics and abide to the compelling normative toward environmental friendly, energy saving production processes. Follows how the PSS logic is generally routed in defining strategies for the recovery of efficiency in manufacturing processes, according to an incremental innovation logic.

On the other hand, the application of the PSS rationale to the manufacturing sector is a relevant topic of research across Europe, as showed by the number of research project funded by the European Union. Here some examples retrieved form Cordis website (Commission, 2011). MEPSS (Methodology for Product Service Systems) aiming at provide the industry a toolkit to analyse and appraise the implementation and impact of new PSS solutions (2001-2004). SUSPRONET (Sustainable product development network; 2002-2004), a project based on the construction of a network of expertises for the definition and exchange of best practices on PSS and related research opportunities. KOBAS (Knowledge Based Customized Services for Traditional Manufacturing Sectors Provided by a Network of High Tech SMEs, 2004-2007), a project oriented to provide new insights in the current practices in the use of manufacturing machines, to enable the quick customisation of solutions as well as machine configuration, maintenance, training and management support functions. And finally NEXT (NEXT generation production systems, 2004-2007), an interesting project committed in determining the machines of the future and the sector's new business models, and in assisting to the transformation the manufacturing industry. A review of the massive quantity of publications and material produced is well beyond the scope of this

paper. However, we try to reach some conclusions about this activity from this short survey of the literature. We think there is a lock in action here, steering the discourse on NBM in manufacturing dominated by an engineering-financial culture. This situation has been encouraged by the influence of external trends. The research activities, conducted mainly at European level, look at the energy consumption and to the introduction of new materials to comply with the sustainability discourse dominating the manufacturing landscape. On the other hand, the demand id dominated by big firms, associations and thematic platforms. Their need to prioritise and select themes and actors to access to European funding complemented the technological (bottom line) rationale, proposed by research and governmental institutions. The core dynamics of NBM in manufacturing are therefore characterised by engineering (industrial, mechanic and new material), ICT and finance. This, in turn, facilitates the cooperation with industrial partners (normally big firms) but impose some limitation on the scope and variety of the solutions proposed.

Figure 5 - New Business Models as PSS

(source: Copani, 2011)



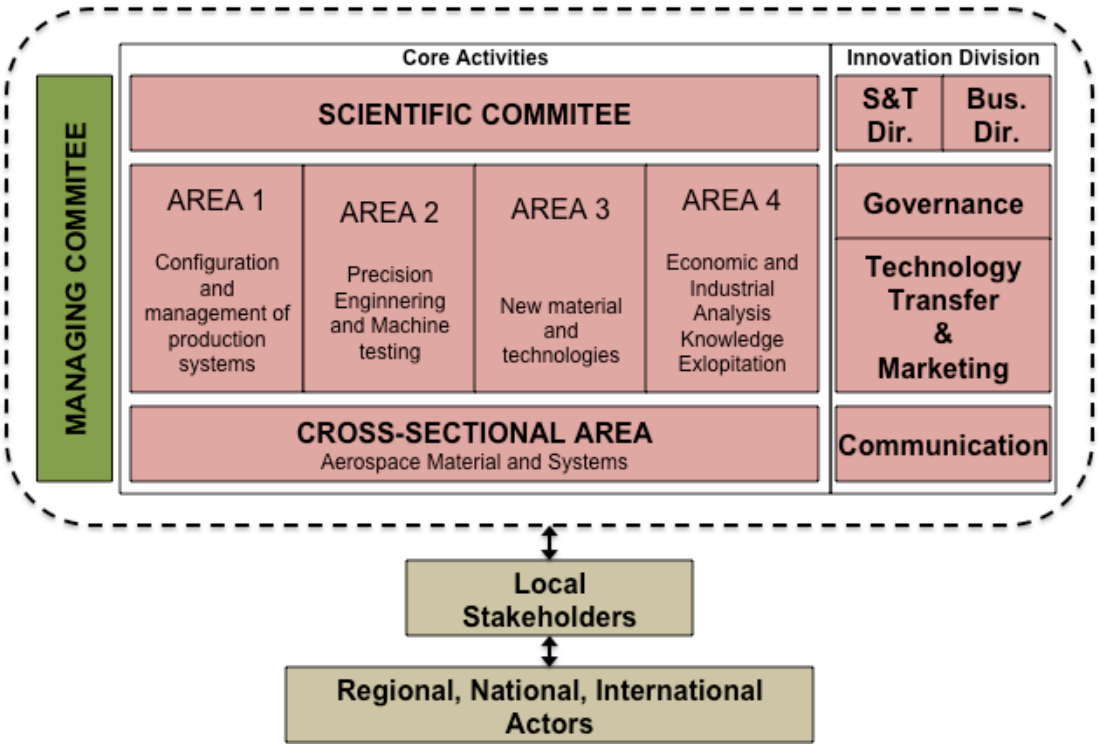
As we can see from Figure 5, the rationale for the development of NBM according to the PSS framework is mainly based on the development of products' implicit technologies and properties. Furthering the tradition of PSS design, the NBS rationale is centred on the evolution of the supply chain structure and management. The pre-eminence of a strict vertical/sectoral dimension however, is challenged by recent contributions dealing, trying to shift the focus from a product to a client centred perspective (Kobler et al., 2009, Biege et al., 2009). The rationales used to justify the adoption of NBM (based on a PSS logic) are normally related to the rationalisation of production processes, the related decrease of energy consumption and finally the financial benefits accruing from the new capital structure (Kang and Wimmer, 2008). Notwithstanding the valiant efforts to move the research from the theoretical to the industrial level, the adoption of new business models seems to be a privilege of big manufacturing firms (Lay et al., 2009). Looking at the general trends of the European manufacturing sector, a common positive trend seems to emerge. The comparison between the 2006 and 2010 on the European Manufacturing Survey shows a clear propensity to embrace a service-centred strategy. In 2006, the 88% of firms surveyed did not plan to

adopt a NBM based on PSS logic, while in 2010 the great majority integrate their offering with services (85%), witch directly or indirectly generates the 16% of revenues (cfr. Copani et al., 2007, Lay et al., 2010).

6.2 - The Intermediary Organisation

MUSP is an applied research laboratory pertaining to the technological district on manufacturing and located in the Piacenza's technopole. It has been founded in 2005 as joint initiative between universities (Polytechnic of Milan and Catholic University of Milan), local manufacturing firms, a sectoral association (UCIMU, the national association of machine tool and equipments producers) and local institutions (a bank foundation, province and city governments, local employers association). In 2008 MUSP strengthen its technology transfer capabilities by the establishment of an innovation division (Innovation MUSP - i-MUSP), following the incorporation of a local innovation centre (the actual organizational and governance structure is showed here below – Figure 6).

Figure 6 - MUSP Lab.: Organizational and Governance Structure



MUSP is an example of the research laboratories recently established with the support of the regional government, with the am to integrate the regional industrial and research systems toward a regional innovation system. Although the organizational, governance and operative models are still very different, the establishment of technopoles highlighted the requirement of organizational and legal independence of each laboratory from its shareholders (mainly universities' departments). In this respect, MUSP constitute an interesting case of analysis, as its legal and operative autonomy endures since its foundation. It is a consortium with independent legal status, ruled by industrial partners according to

private logics and expectations. The managing director is a full professor in mechanical engineering with relevant professional and industrial vision, thanks to its professional experience as manager in an important manufacturing company.

6.3 - The Opportunity

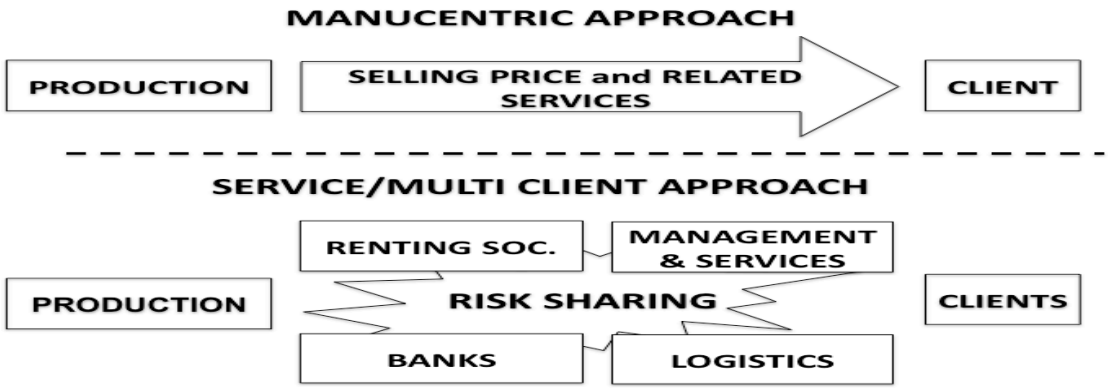
The opportunity for this service-innovation has been introduced by the disruptive effect of the economic downturn on manufacturing sector. This forced firms and researchers to focus on different key factors, other than the superior performances granted by the technological edge of Italian firms. On the other hand, the effectiveness of traditional strategies (relationship with clients) is partially countered by financial pinch and credit restriction (the demand is only potential or not existent). In this context MUSP decided to start an internal, independent project aiming at explore the feasibility of NBM based on renting and leasing. The idea was to propose solutions ready to use, easy to adopt and understand from SMEs. The rationale for this project was based on some simple assumption: a) the potential value accruing from the technological content of modern machinery was actually underestimated, b) other engineering intensive sectors already introduced leasing and renting in their business models (i.e. power generation, oil and gas industry), c) the technical life of machine tool is actually longer that they commercial one. On the other hand, the research centre was actually interested in analysing the technical problems associated to the passage from a traditional to a service centred orientation. It is widely accepted that the introduction of PSS in firms' manufacturing strategies implies a revision of the traditional architecture of the products. This problem however, is normally tackled form a technological perspective and not starting form the final service (or service system) (Biege et al., 2011).

The idea to propose renting and leasing as key elements for this business model, was initially advanced by the director of the newly born innovation division. He is an external consultant with relevant experience in the field of applied research and development. The idea came from the simple observation of how renting and leasing were diffused and common practices in different manufacturing sectors. Moreover, given the result of the 2006 European Manufacturing Survey - 25% of firms not adopting NBM due to limited technical or commercial capabilities, the 63% do not understand the applicability – has been actually interpreted as a positive element here. We read these results as lacking of absorption capabilities from firms, combined with a weak relational capability from research and consultancy organisations. Conversely, this was an opportunity to explore, in order to propose new solutions for a quite conservative environment like the tooling machine sector. A point of view that seems to be comforted by recent studies on manufacturing challenges on his way to servicisation (Vladimirova et al., 2011).

6.4 - The Innovation proposed

The innovation proposed could be defined as an architectural one, a bundling of contracts and practices that are innovative for the market/sector, but at the same time familiar for producers and consumers. The conceptual bases of this model are the importance of networks and system of relationships in structuring and delivering the value proposition, the rapid adaptation of contractual and procedural schemes already existents, the re-redefinition of service's role in the strategy of the firm. Our aim is to propose an effective, simply understandable model aiming at exploit the massive use of ancillary technologies in the modern tooling machines as well as tapping in the growing market of retrofitting and second-hand machinery (e.g. ICT, MEMS, RFDI sensors and accelerometers) (AAVV, 2011, Conti, 2007). The basic idea is to introduce the practice of renting and leasing in the sector of tooling machines, thanks to an adaptation of the contractual and functioning mechanisms. This should mitigate the problems (and limits) manifested by producers and clients in understanding and exploiting the new business models. In order to ease the design, communication and delivery processes, it has been necessary to expand the traditional system of partnerships adding, to the usual vertical dimension, a horizontal one (Lay et al., 2009). There is a bank with experience on renting and leasing contracts, a rental association with experience in the management of the contracts and the logistics of the renting and leasing processes for industrial machinery, and a research centre able to select, manage and adapt specific technologies for renting and leasing purposes.

Figure 7 - Traditional and New Business Models
(our adaptation from Miles, 2009)[4]



In Figure 7 above, we compare the two business models proposed. The first, "manucentric" is focussed on the specific product. This refers to the traditional business model adopted by the SMEs in this sector. The value proposition is characterised by the level of personalisation of the product (machine tool) and by the ancillary nature of the services introduced. This strategy, already known in service studies as "encapsulation" (Howells,

[4] MANUCENTRIC – "assuming that the models and logic of manufacturing industry, or parts thereof (typically high-tech sectors), apply with very little qualification to the service activities that are found in service sectors and more widely across the economy." (Miles, 2009 http://knowledgeintensiveservices.blogspot.com/2009_12_01_archive.html (last access, 18/02/2011)

2004), represents the dominant heuristic in manufacturing business model and has been classified by Tukker among the product oriented strategies (Tukker, 2004, cfr.Figure 4). According to this model, the tool machine (product) is designed to solve specific problems faced by the target market, and the profitability is highly connected to the after sale services as well as maintenance and other specific functions proposed by the supplier. This close relationship with customers allows the producers to constantly monitor critical market and technological trends but, on the other hand, overlooks the possibilities given by the introduction of ICT (e.g. interoperability and remote management of the process). On the other hand, the transfer of property rights form supplier to customer highlights the intrinsic value of the machine in a specific moment, neglecting the strategic value related to the life span of the machine. Then we defined this concept as manucentric as related to a culture based on physical product, where engineering (in particular mechanical engineering) defines the main terms of reference. Here services still have an ancillary position, while the design is mainly focused on the deployment of functional characteristics of products and technologies (Mitsuishi et al., 2008, Meyer-Kramer, 1996).

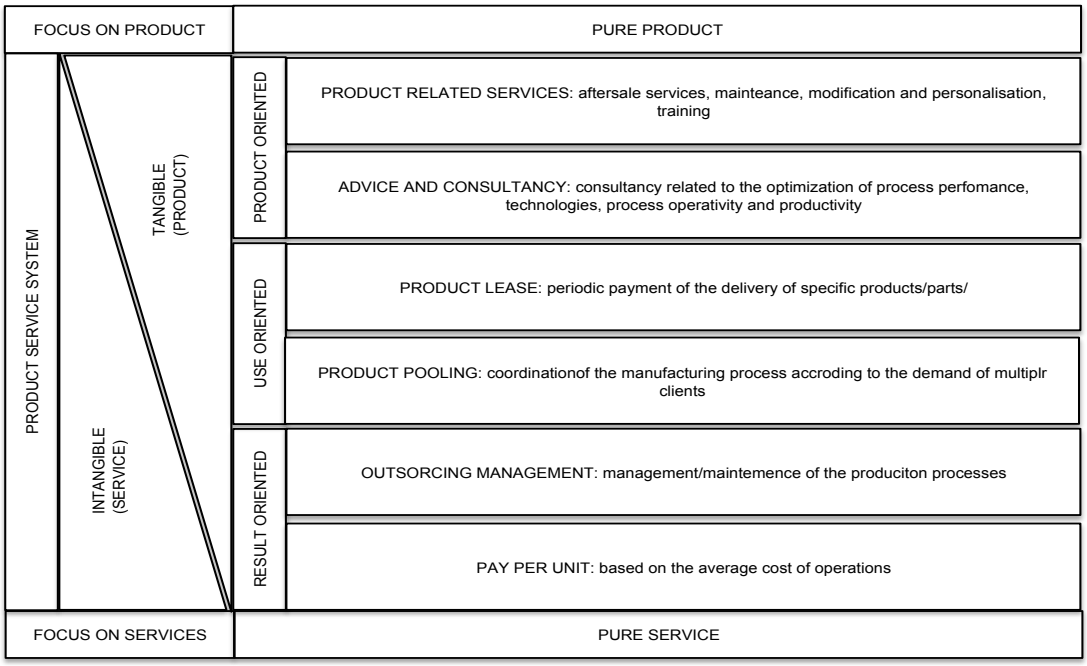
Figure 8 – Morphological Box for NBM on renting
(adapted from: Lay et al., 2009)

Characteristic Features		Options			
Ownership	During phase of use	Equipment producer	Leasing Bank	Joint Venture	Customer
	After phase of use	Equipment producer	Leasing Bank	Joint Venture	Customer
After phase of use	Manufacturing	Equipment producer	Operating joint venture		Customer
	Maintenance	Equipment producer	Operating joint venture		Customer
Location of operation		Equipment producer's establishment	Establishment "fence to fence" to the customer		Customer's establishment
Single / multiple customer operation		In parallel operation for multiple customers		Operation for a single customer	
Payment model		Pay per Unit	Pay for Availability	Fixed Rate	Pay for Equipment

The aim of this new business model is to explore the possibilities offered by contracts and practices extensively used in other sectors, for the provision of services along all the life cycle of the machine. The feasibility of the concept has been explored in two consecutive meetings with academics, consultants and representatives of the machine tool sector. The tool utilised to explain the possible model's architectures and explore related issues has been the "morphological box", a scheme introduced during the last part of the 1960's and widely used in the field of PSS modelling (Lay et al., 2009). To introduce the topic of new business models, we produced a presentation highlighting the difficult economic condition, and the

structural change this would have produced in manufacturing related sectors. On the other hand, we justified the introduction of the “renting hypothesis” as an interesting perspective, even if not the only one. However our proposal was underpinned by very simple examples proposed in the European Renting Association (ERA) annual report, carefully selected to reflect the manufacturing and industrial nature of this sector: oil and energy was then selected (ERA, 2009). The purpose here was to question the anchoring effect of product and technology (mainly mechanical engineering and material science) as main component in the value proposition. On the other hand, this representation allowed members from different professional and scientific backgrounds to interact purposefully following a problem solving perspective. To notice how engineers recognized this modular scheme very useful to define (and explain) the concept of Reconfigurable Manufacturing Systems (RMS), while economists were able to associate to RMS, concepts as economies of scale and scope, as well as the resource base view of the firm. However, all these information lacked of consistency: a narrative or discursive path has to be introduced.

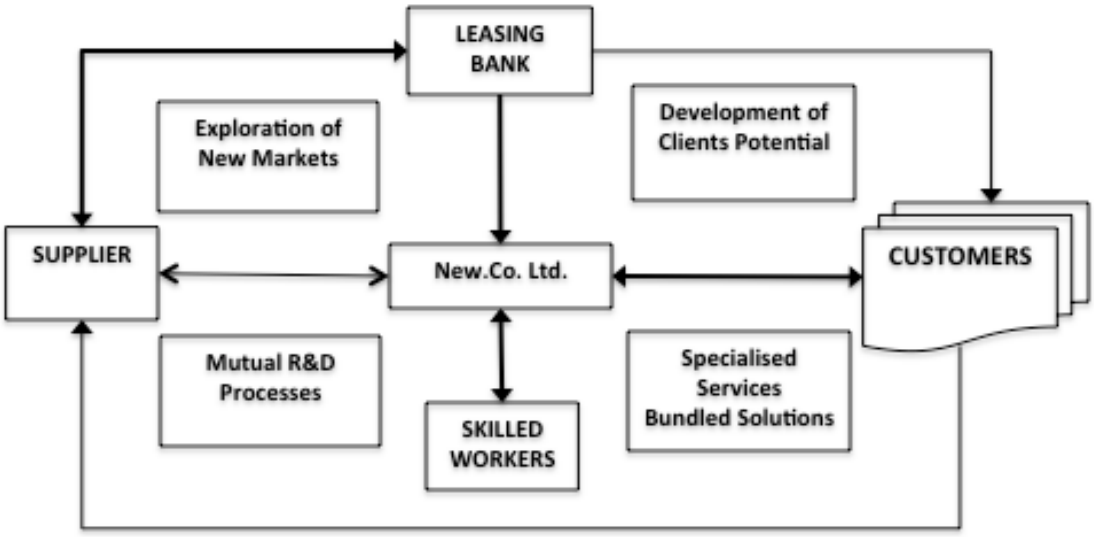
Figure 9 - Classification of possible BM
(adapted from Kobler et al., 2009, Tukker, 2004)



An interesting aspect emerged from the meetings with academics (mainly engineers and economists) as well as consultants, bankers and other professional operators. The business model proposed was used by the different actors as a “learning tool”, in order to make sense of the possible applications, highlighting problems and opportunities and shaping, at the and, a common understanding. So instead of an architectural model, this has been proved to be a “marked device” by which members for different communities progressively shaped their minds, allowing them to appraise (from the economic, technological and legal perspective), opportunities and threats. In Figure 9, we offer a classification of possible business models

obtained form the elaboration and synthesis of the group's discussions. In order to facilitate the understanding of the NBM proposed, we offer a functional model here below in Figure 10. We hypnotised the creation of a new organisation (New Co.) with the aim to coordinate the activities between the different actors involved and in charge of the management of contracts and revenue system related to the renting of machinery.

Figure 10 - Functional representation of NBM



However, the model is still in its prime, and one of the main issues to tackle for its implementation is the definition of specific market niches to be targeted and the inherent modification of machinery's structure. For this reason, in 2011-2012 MUSP decided to establish a working group focussing on this problem. The product adaptation, on the other hand, is one of the relevant problems to be faced for the delivery of NBM according to a PSS Perspective. A recent publication articulate this issue in six main points (Biege et al., 2011): 1) define and implement the monitoring system; 2) standardisation of the components; 3) design of the production system according to a 4) modular perspective; 5) identify products with long life-cycles; 6) design the product to be easily assembled ad disassembled. Beside the technical aspects, this project poses specific challenges related to the organisation of the logistics' flow, as well as security and pricing procedures. However, these issues can be solved profiting from the experiences accruing form other complex product systems such as power generation, oil and gas and aerospace (Nordin and Kowalkowski, 2010, ERA, 2009, Hesselbach and Herrmann, 2011).

7 – DISCUSSION

The business model proposed is meant to help local SMEs cluster to upgrade their relationship with market characterised by a highly volatility of demand and geographical distance. It builds on the PSS framework profiting form already available technologies, contracts and experiences from similar sectors. The main hypotheses on which this model is based are coherent with the trends manifested in manufacturing sector at large. We have considered the increasing service orientation of clients and markets, the specific capabilities introduced by sensors and other technological components already in use in the design of machine tool and considered the geographical and strategic importance of emerging markets. The specificity of the model proposed can be summarised in the variety of partners involved in the design and deployment of the model, the importance of skilled workers, the strategic and economic potential of the information generated by the exchange of goods and services. On the other hand, we realised the importance of the design process in defining a common understanding between the different (potential) partners, in order to formulate specific and doable solutions. In this perspective, we recognised the potential use of NBM design as systemic instruments for the evolution of traditional clusters.

Figure 11 – NBM contextualisation

		BM REPRESENTATION	
		OBJECT	PROCESS
IMPACT	BUSINESS	•DECOUPLING SERVICES FROM PRODUCT •TECHNOLOGIES AS FACILITATORS •RE-DEFINITION OF PRODUCT ARCHITECTURE •SERVICE INNOVATION	•FROM PRODUCT CENTRIC TO CLIENT CENTRIC •ROLE OF ACADEMIA IS LIMITED (AS A PEER) •COLLABORATIVE ENTREPRENEURSHIP
	SYSTEM	•IS A SYSTEMIC INSTRUMENT •REALISATION OF PURPOSEFUL ENACTMENT	•INTERACTIVE/REFLEXIVE DIALOGUE •FOCUS IS ENDOGENOUS POTENTIAL •SOURCE OF SYSTEMIC INTELLIGENCE

In Figure 11, we try to put our model in context, highlighting the potential impacts (or outcomes) and the possible representation of the BM, according to the model built on recent literature (George and Bock, 2011). At business level, the implementation of this NBM is characterised by a decoupling of product and service dimensions, highlighting the passage from a product to a service centred strategy. Technologies are normally considered as a cornerstone of SMEs competitiveness, are here considered as enabling factors. Moreover, the exploitation of “on the shelf” technologies, implies the introduction of new products’

architectural solutions. This can be achieved only by an enhanced modularity structure underpinned by an increased components' standardisation. Standardisation and modularity, implies the definition of a new appropriability strategy based on a mix of contractual, relational and resource dependency elements. The strategic outcome here is the shift form a product to a service centred rationale, from which innovation can be distinguished according to its application (and not technological contents), evaluated according to the benefit or value generated by the client during the use and, finally is reproducible (Toivonen and Tuominen, 2009).

The impact at business level is however related to the learning process implied in the design, formulation and structuraction of this final idea. We here focus on the activities and time dependant process related to the NBM generation. Firstly, we have a shift form a product to a client centred perspective, an element already well discussed in the document. However, the role of research institutions here is only ancillary as the discourse on technological contents fades, introducing the issue of bundling of already available solutions (eg on the shelf technologies). What we want to highlight here is that the effect is not only in the organisation of the technology transfer or development processes, as the role of universities (and related research centres) looses its technical/functional neutrality. An issue already discussed in introducing the emerging role of innovation intermediaries and that here can be appreciated at first hand. What we observed in this process was the development of a collaborative network between different actors (i.e. universities and research centres, employer associations, consultants, banks and other institutions) in order to explore, test and address the feasibility of this idea. On the basis of this newly established common understanding, the project has been carried on under the coordination of the research laboratory (championing the idea). This kind of behaviour can be defined as collaborative entrepreneurship. Collaborative entrepreneurship relies on the development of specific strategic orientation, defined as entrepreneurial orientation (Lumpkin and Dess, 1996)[5].

Collaborative Entrepreneurship, defined as: "the creation of something of economic value based on new, jointly generated ideas that emerge from the sharing of information and knowledge" (Miles et al., 2006;2), can be conceived as a way to organise a steady pace for innovation performances (continuous innovation). The authors define collaboration as "a process where two or more parties work closely with each other to achieve mutually beneficial outcomes" (Miles et al., 2006) However, the terms collaboration here is extended to organisations pertaining to different sectors, which decide to merge their effort with the aim to explore, source and manage in the best way their knowledge base (Ribeiro-Soriano and Urbano, 2009, Miles et al., 2005). From this observation, we introduce the idea of a BM as a Systemic Instrument with a potential role to play in the evolution of traditional clusters. We

[5] *"An EO refers to the processes, practices, and decision-making activities that lead to new entry. It emerges from a strategic-choice perspective (Child, 1972), which asserts that new-entry opportunities can be successfully undertaken by "purposeful enactment"* (Lumpkin&Dess, 1996:136)

justify this position according to the literature exploring the BM as a market device, defined as *"the material and discursive assemblage that intervene in a construction of markets"* (Muniesa et al., 2007). The authors refer to the term "assemblage" to pinpoint the voluntary agreement between different, independent agents aver a common point (ie. agencement). To note how this element helps to qualify the systemic nature of this instrument aiming at realise what has been called a "purposeful enactment" (Van de Ven and Poole, 1995) impinging on the internal organisation of agents and qualifying (directing) their behaviour.

Of course, the process relies on a interactive and reflexive dialogue between different components of the system, in the exploration and establishment of a common understanding, a typical features of market devices (Buenza and Garud, 2007) and institutionalisation processes (Jensen et al., 2010). On the other hand, the focus on the realisation of this purposeful enactment, highlights the dynamic role played by BM as market device, in helping local actors to think out of the box, in experimenting new avenues and idea and, to summarise, to enhance the innovativeness of the cluster. While innovation scholars appreciate this kind of dynamics as one important aspect of the innovation process, the perspective for technological agencies and other governmental organisation is still superficial. Surely the adoption of restrictive normative models for the evaluation of public policies' deployment play an important part here, inhibiting the experimentation and consequent learning dynamics of public officers and institutions (Potts, 2009). Other observe how the influence of the so-called "development industry" enhanced the development normative and prescriptive features for policy strategies (Uyarra and Flanagan, 2010). In this perspective, an important systemic outcome for the development of NBM is the constitution of an intelligence system able to expand the understanding of public institutions according to the evolution of local systems. To conclude this discussion, in Table 2, we try to summarise the opportunities arising from the experimentation of this NBM, according to the characteristics of the specific PSS characterising the new offering. We limit our analysis to the business side of the impact as the project is still in its prime and effects at a different governance level cannot be appreciated.

Table 2 - NBM components: characteristics and opportunities
(Barquet et al., 2011)

COMPONENTS	CHARACTERISTICS		OPPORTUNITIES
	Use-Oriented Services (UOS)	Results-Oriented Services (ROS)	
CUSTOMER SEGMENTS	Low initial investments Property of the machinery not strategic	No initial investments High flexibility in demand and productions	Change relationship with traditional markets Access new, dynamic niches
VALUE PROPOSITION	Ownership with the supplier or intermediary Modular payment options Deliver of specific capabilities	Delivery of ad-hoc solutions (product and/or services)	Creation/destruction of specific capabilities Extend the network of critical partners
CHANNELS	Easy and quick transactions. Management of risk according to personalised contracts	Interface with multiple clients Rapid detection of trends and critical aspects of the demand	Possible tensions with intermediary organisations Balanced with value of information and variety of potential market
CUSTOMER RELATIONSHIP	Blend of transactional (contract) and relational (contact)	Definition of ad-hoc interfaces with clients	Creation of a specialised agent in charge fro the management of some critical aspects of the transaction
REVENUE STREAMS	Blend of pay per use, availability. Possible demand shaping and price discrimination	Pay per unit (or time) Definition of payment plans along all the life of the good Design of services' bundling strategies	Definition of specific price strategies
KEY RESOURCES	Skilled Workers are critical	Skilled workers are critical Information and knowledge are critical	Shift from a product to a knowledge intensive components
KEY ACTIVITIES	Design of specific providers' structure and strategy Contracts and agreements are critical Development of a service oriented managerial culture	Service providers are critical partners in the design and deployment activities Strong focus on scouting and analysis of customers' needs	Passage form a reactive to a proactive stance. The time to market Development of real time analysis capabilities on markets' need and trends
KEY PARTNERSHIPS	Establishment of long time relationship based on co-operation (not more ownership)	Need to manage a network of highly skilled, and potentially independent actors	Development of specific services
COST STRUCTURE	Capital intensive	Risk intensive	Definition of innovative contractual. Relational and organisational structures to manage the life-cycle costs and deployment of the machinery

The pivotal role of the research laboratory (MUSP), as promoter, pivot and animateur of the project, testifies its passage form a functional to a proactive behaviour. This observation seems to be in line with the evolution of public or semi-public research institutes presented by recent literature (Jain and George, 2007, Hagedoorn et al., 2003), along with the emergence of the intermediation functions (Winch and Courtney, 2007, Howells, 2006). Characteristics of this phenomenon are the non-neutrality of these infrastructures and the adoption of specific strategies aiming at influence or someway direct the institutionalisation of socio-technical networks (e.g. partaking) (Garud and Karnøe, 2003). Contorted by the experience accrued by the direct observation of the process, we assumed the development, by the intermediary, of a specific entrepreneurial orientation, contextualised in a collaborative entrepreneurial effort.

8 - CONCLUSIONS

The aim of this paper was to explore the potential role of innovation intermediaries in the evolution of a traditional cluster in developing a service oriented attitude. After a critical review of the available literature on business models and innovation intermediaries, we introduced the case in object. A region, recently empowered by new responsibilities and characterised by a industrial base devoted to traditional productions, began to question the structure and remits of its actual system of innovation. Following a specific RTI program for its requalification, the need to engage the regional research system, induced the creation of a specific network of institutes (Research laboratories) meant to organise, match and steer the regional R&D activities. The case study, profiting form the analysis of a specific project promoted by one of these laboratories, try to unravel the potential and unintended outcomes of this program.

The preliminary results for this case study suggest that the adoption of business models from a service centred perspective can stimulate the innovation process of firms in two ways. Firstly, we have the different approach to the market, not more based on the level of personalisation of products (in this case machines tool), but according to a market and client perspective. Secondly, this kind of business model affects the way in which machine tool producers approach the sourcing of technologies and knowledge form the third parties. Based on this first, limited observation, the impact of a service cantered perspective on machines tool producers; suggest a standardisation of the product architecture and features. On the other hand, the effects on technology acquisition can be appreciated adopting a more heterogeneous perception on available knowledge, technologies and practices. In other word, the prominence of scientific knowledge is counterbalanced by the observation and adoption of business practices already in use in other sectors. The specific case refers to the adoption of renting and leasing practices, as well as the integration of the value proposition with other kind of services.

On the other hand, if we consider a business model as a marked device, its adoption influences each actor involved: firms, intermediaries and, possibly, regional and sectoral institutions. In particular, the role of innovation Intermediaries (in this case a Contract Research Technology Organisation – C-RTO) shifts form a pure functionalistic perspective to a more entrepreneurial one. By the role played in the process, the nature of inputs and knowledge mediated, and by the active involvement of the organisation, we started to think about the possible emergence of a collaborative entrepreneurial solution between core SMEs in the cluster (leaders), Intermediary and, possibly the Regional Innovation Agency. The exchange of information and experiences, the elaboration of practices, the analysis of emerging problems and relative solutions diverges in typologies and contents, fro the usual (dyadic) relationships between users and suppliers of technological knowledge. So conceptualising a business model as a process, it could be compared to a systemic instrument for the effective governance of innovative processes.

We tried to justify our considerations profiting from the available materials and literature at the best of our ability. However, results and conclusions should be taken with great caution given the initial stage of the project and the limited scope of the observation.

Acknowledgment

This contribution has been possible thanks to the research grant provided by the Department of Economic and Social Sciences (DISES), Catholic University of Milan, Piacenza campus; while the author, in secondment, was working at “Laboratorio MUSP”. I must thanks Prof. Francesco Timpano, Prof. Michele Monno, Mr Mario Salmon, for their support during my working period at the MUSP Laboratory. Their suggestions, help and confidence in my abilities have been exceptionally important for the conclusion of this project. The interpretation it contains is entirely mine, as are any deficiencies. A special mention is form my supervisors Dr. Neil Alderman and Dr. Fiona Whitehurst for helping me. Comments on subsequent drafts by Dr. Dimitri Gagliardi, Prof. Mo O’Toole, Prof. Knut Koschatzky, Dr. Ronald Ramlogan and the staff at ZEW in Mannheim have been very much appreciated.

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