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The Emerging Properties of Business Models: A systemic Approach

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Abstract:

Aim of this paper is to explore the emerging properties of business models design processes in complex contexts such as a traditional manufacturing cluster. To do so we distinguish between a static and dynamic perspective on business models, profiting from a critical analysis of the recent literature. Then we define the service orientation landscape for manufacturing sectors, approaching different strands of analysis. On this canvass, we present our case scenario based on an ongoing project for the design and delivery of new business model concept for the machine tool sector, based on renting and leasing. The analysis of this case will allow us to draft some conclusions about the emerging properties of business models design processes in context different form the one traditionally used to this kind of activities: a cluster of Italian SMEs. The interesting aspects accruing from this analysis lays on the different roles played by public and semi public institutions in participating to this pilot project. Moreover, the business models’ systemic impact and strategic dimensions will be explored, showing how this tool can be considered as a systemic instrument for the governance of the innovative processes.
The Emerging Properties of Business Models: A systemic Approach

1. INTRODUCTION

In the last ten years, Business Models mobilised the discourse among scholars and practitioners for their role in explain the inner functioning of a firm as well as to streamline the evolution of their strategies (Demi and Lecocq, 2010, George and Bock, 2011, Zott and Amit, 2008a). Although this discussion is still in its formative phase, different schools and orientations can be distinguished here, proposing this concept as a useful tool to understand the evolutionary behaviours of firms, highlighting their entrepreneurial attitude in coping with increasing competitive conditions (Magretta, 2002a, Chesbrough and Rosenbloom, 2002, Chesbrough and Schwartz, 2007).

Aim of this paper is to explore the emerging properties role of New Business Models (NBM) for the evolution of a traditional cluster toward a service-oriented perspective. To do so, we will justify the similarities between business models and systemic instruments, highlighting their specificity and uniqueness. The focus here is on specific infrastructures created by the Emilia-Romagna government as part of its renewal 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 (Bianchi and Bellini, 1991, Bianchi and Labory, 2011). 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 their path of revitalisation (Winch and
This paper is organised in three main parts. Firstly, in section 2 and 3, we structure a critical review of the literature on innovation intermediaries and business model research. We conclude proposing of an analytical framework for the definition of the dynamics and impact of business models’ deployment. Secondly, section 4 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, in section 5 and 6 we 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. BUSINESS MODELS: Review and Classification

Business Models (BM) are a quite recent concept in the field of business and economics. Their appearance in the public domain begins with the rise 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 (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. For both communities BM express the capability to enact a commercial opportunity (Chesbrough and Rosenbloom, 2002, Magretta, 2002b). While academic debate struggles to reach a common definition, practitioners seems to be less fragmented on BM. Here, three main common rationales 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 (George and Bock, 2011). Another critical point is the discourse on the legitimisation of BM among academics, pivoting around the relationship between firms and environment. BM are seen as a tool leading the evolution and adaptation of businesses to their context (Demin 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), influencing then the process of structural change, proposing new actors and agencies (Teece, 2010, Gambardella and McGahan, 2010). The contribution of Doganova and Eyquem-Renaul, tries to make sense of the complex set of the intrinsic knowledge dynamics related to the emergence of BM as a market device (Doganova and Eyquem-Renault, 2009). This contribute to expand the generalisation of BM construct, moving away from their static representation according to structures, systems of relationships and “meta-frameworks” (Osterwalder et al., 2005, Conte, 2008), toward a more dynamic, democratic and open posture (Mason and Spring, 2011, Baden-Fuller and Morgan, 2010).
Beside the practice and the diffusion among business and practitioners, this phenomenon relies on common routes. 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 and 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). 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 Osielander 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). Finally, Demil and Lecocq summaries 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, 2008b, Doganova and Eyquem-Renault, 2009).
In Figure 1, we try to summarise the different perspectives on BM according to an epistemological classification proposed by Callon (1989). On the columns, we have the passage toward a multidimensional and social dimension in the development of knowledge, (Polanyi, 1958). On the rows, we represent the different uses of the knowledge produced. 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). Here we have four different dynamics.

1. Essentialist: tries to define the phenomenon according to a specific theoretical base;
2. Functionalist perspective: the ends and functions define the phenomenon;
3. Pragmatic: is a output based perspective in which the phenomenon is defined by its end;
4. Systemic: the phenomenon is defined by its recursive and reflexive dynamic.

**Figure 1 - Business Model Classification**

<table>
<thead>
<tr>
<th>KNOW. STRUCT ➔</th>
<th>One-dimensional (Pre-Polanyi) Rationale: Specialisation, Organisation</th>
<th>Complex (Post-Polanyi) Rationale: Translation, Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOW. NATURE ➖</td>
<td>崧</td>
<td>崧</td>
</tr>
<tr>
<td>Normative</td>
<td>ESSENTIALIST PERSPECTIVE</td>
<td>PRAGMATIC PERSPECTIVE</td>
</tr>
<tr>
<td>Reality is immutable Science reflects this structure.</td>
<td>Theory Based – Mode 1 BM as Blueprint (intelligent design)</td>
<td>Object Based - ANT BM is a By-Product</td>
</tr>
<tr>
<td>Discursive</td>
<td>FUNCTIONALIST PERSPECTIVE</td>
<td>SYSTEMIC PERSPECTIVE</td>
</tr>
<tr>
<td>Reality is complex (institutionalisation)</td>
<td>Practice/Output based – Mode 2 BM embodies set of relationships</td>
<td>Process Based – Discursive BM is a systemic tool</td>
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</table>

This classification stresses a trend already appreciable in the literature discussed up to now. BM studies progress from 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 (i.e. mertonian and market norms). On the other hand, we highlight the emergence of another dynamic where knowledge is contested and a 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 the nature of the participating actors and 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). Otherwise, in 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).
3. 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 (Howlett, 2009, Talbot, 2005, Kuhlmann et al., 1999). They emerged as a common field of interest to design, manage and pace the evolution of systemic contexts (Howlett, 2000, Smits and Kuhlmann, 2004). 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. Here 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). What distinguish this approach from the traditional one is the focus on the emergence of new technologies (and technological paradigms), while traditionally this aspect has been oversees by the traditional approaches, mainly concerned about the application and diffusion of technological knowledge. These aspects highlight the important role played by Business Models as systemic instruments in the process of emergence (and structuration) and diffusion of specific populations, which could be defined as organised expression of agency (cfr.Dopfer and Potts, 2008, Ch2, Dopfer et al., 2004).

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. The role of systemic instruments in an innovation system is to solve a problem of coordination and specialisation 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.

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 have been considered as a collection of biotypes of different institutions (Smits and Kuhlmann, 2004:9), at work in a specific ecosystem. 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 (David and Metcalfe, 2008, De Liso et al., 2011). 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 Impact Matrix**

<table>
<thead>
<tr>
<th>BM REPRESENTATION</th>
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<tbody>
<tr>
<td><strong>OBJECT</strong></td>
</tr>
<tr>
<td>Structure and Organisation</td>
</tr>
<tr>
<td>Knowledge Base</td>
</tr>
<tr>
<td>Product Architecture</td>
</tr>
<tr>
<td><strong>PROCESS</strong></td>
</tr>
<tr>
<td>Relationships and Contracts</td>
</tr>
<tr>
<td>Boundary Spanning</td>
</tr>
<tr>
<td>Routinisation</td>
</tr>
<tr>
<td><strong>SYSTEM</strong></td>
</tr>
<tr>
<td>Value and Performances</td>
</tr>
<tr>
<td>Strategic Partnerships</td>
</tr>
<tr>
<td>Sense making</td>
</tr>
<tr>
<td>Legitimisation</td>
</tr>
<tr>
<td>Systemic Intelligence</td>
</tr>
</tbody>
</table>

(our elaboration on: George and Bock, 2011, Vargo and Lusch, 2008, Kwan and Soe-Tsy, 2011)

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.

4. 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 tries to highlight the emerging properties of business models, in order to explore the possible strategic outcomes for private and public contexts according to a systemic perspective. The case in object relates to a pilot experiment aiming at design a new business concept for a local manufacturing cluster (machine tool). As the project is still in its prime, we can offer only preliminary conclusions based on the first part of the process.

4.1 - 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 fuelled the rise of PSS in manufacturing (Isaksson et al., 2001): 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; 3) the progressive adoption of total cost of ownership and total life-cycle costs as standards for the products’ selection; 4) the increased variability of demand, induces the adoption of hybrid solutions to manage markets’ discontinuity. The outcome is the growing service orientation of traditional sectors, based on the dyadic relationship between artefacts’ technological contents and the role of knowledge dynamics in consumption processes (Vargo and Lusch, 2004, Vargo and Lusch, 2008). The value proposition here is evolving according to a network logic for the exploration and exploitation of business opportunities (Vladimirova et al., 2011, Biege et al., 2011, Jacob and Ulaga, 2008).

The impact of services on manufacturing can be appreciated according to three major perspectives (Xu and Wang, 2011). Firstly, we have the perspective that sees products and services as the same: Everything as a Service (EaaS). Market activities here are focused on the transferring of rights of usage, the access to a specific offering in terms of use and results obtained. This trend is based on the concept of information and property rights. Examples here are the offering of specific bundles of services. An example could be the “power by the hour” strategy form Rolls-Royce or the contract signed by Alstom Transport with the London Underground that ensures a certain availability of trains (i.e. transportation capability) each day of the year (Bessant and Davies, 2007). Secondly, we have the Service Outsourcing Logic, commanded by an increased division of labour between different actors. This leads to the transfer of specific activities up to whole business functions to external (specialised) providers. This is a very common practice among financial services (i.e. web security, document management and storage) and industries as well. Finally, we have the Service Mash-Up where single specialised agents joined in common service platform, combine their
efforts in developing new service propositions. Examples can be found in Business-to-
Business (B2B) marketplaces offering disparate services’ bundling.

Figure 3 - PSS Classification

<table>
<thead>
<tr>
<th>Value in Products</th>
<th>Value in Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TANGIBLE</strong></td>
<td><strong>INTANGIBLE</strong></td>
</tr>
<tr>
<td>Pure Product</td>
<td></td>
</tr>
<tr>
<td>Property rights on Goods</td>
<td>Product related services Consultancy</td>
</tr>
<tr>
<td><strong>EaaS</strong> Accessibility to product/services</td>
<td>++</td>
</tr>
<tr>
<td><strong>Outsourcing</strong> Division of labour based on technology and specialisation</td>
<td>+</td>
</tr>
<tr>
<td><strong>Mash-Up</strong> Division of labour based on common goals</td>
<td>++</td>
</tr>
</tbody>
</table>

(adapted from: Tukker, 2004, Biege et al., 2009, Kohler et al., 2009, Xu and Wang, 2011)

In Figure 3 we try to classify the main PSS configurations according to their expected outcomes. Other authors prefer to use the definition Service and Good Dominant Logic (S-D and G-D) (Vargo and Lusch, 2008). The good centred perspective (G-D) defines services according to their relationship with specific products, functions or technological processes. The outcomes are then evaluated according to their level of product affinity, technological and functional compatibility (i.e. efficiency in terms of time, costs and resource savings, organisational integration). This of course go hand in hand with a neo-classical vision of the product service relationship, defined by the level of specialisation of infrastructures and organisations commanded by the characteristics of the technology adopted (Vargo and Lusch, 2008, Spohrer and Maglio, 2010). Examples are the insurance contracts complementing the good’s offering. For instance we have contracts about the Mean Time Between Repair – MTBR and Failure - MTBF, Reliability Improvement Warranties – RIW, or economic/operative insurances about Total Cost of Ownership – TCO or Maintenance Total Cost of Ownership – M-TCO) (Lanza et al., 2011, Biege et al., 2009, Greenough and Grubic, 2011). On the other hand, the S-D logic shifts the focus on customers. In this perspective
services are defined as the “application of specialized competences (skills and knowledge), through deeds, processes, and performances for the benefit of another entity or the entity itself (self-service)” (Vargo and Lusch, 2004:326). Here the division of knowledge, developing along a recursive and reflexive learning process, substitutes the division of labour and its organisational/technological paradigm. Business models here were mainly conceived as networks of resources and activities leading to a coherent balance between offerings and value proposition. If the G-D logic sees services as the product of a process, the S-D perspective services are seen as specific processes by which services are exchanged between actors, accruing a mutual economic benefit.

Although a review of the massive quantity of publications and material produced is well beyond the scope of this work, we think there is a lock-in action here, confining the discourse on NBM in a technological-financial culture. It is like a box of references and practices with very clear and robust borders that complement, or at most, the traditional perspectives on manufacturing (e.g. manucentric approach to service systems). This model has not been challenged by the current research projects, conducted mainly at European level, dominated by specific topics such as: energy consumption; the introduction of new materials; the sustainability of production processes (environmentally and operatively). On the other hand, big firms, associations and thematic platforms dominate the demand and supply side of applied research at national and international level. Their need to prioritise and select themes and actors to access to European funding constitute a very powerful socio-technical system. 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.

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 justifies the adoption of NBM for 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). However, this perspective is challenged by recent contributions trying to shift the focus from a product to a client centred perspective (Kobler et al., 2009, Biege et al., 2009, Vargo and Lusch, 2008, Kwan and Soe-Tsy, 2011).

4.2 - 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 4).

Figure 4 - 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 aim to integrate the regional industrial and research systems
toward a regional innovation system. 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.

4.3 - 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).

4.5 – 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, RFID 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 5 – Traditional and New Business Models**

![Diagram](image)

In Figure 5 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, 2004), represents the dominant heuristic in manufacturing business model and has been classified by Tukker among the product oriented strategies (Tukker, 2004, cfr. Figure 3). 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

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2 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](http://knowledgeintensiveservices.blogspot.com/2009_12_01_archive.html) (last access, 18/02/2011)
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 (Mitsuiishii et al., 2008, Meyer-Kramer, 1996).

Figure 6 – Morphological Box for NBM on renting
(adapted from: Lay et al., 2009)

<table>
<thead>
<tr>
<th>Characteristic Features</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td></td>
</tr>
<tr>
<td>During phase of use</td>
<td>Equipment producer</td>
</tr>
<tr>
<td>After phase of use</td>
<td>Equipment producer</td>
</tr>
<tr>
<td>After phase of use</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Location of operation</td>
<td>Location of establishment</td>
</tr>
<tr>
<td>Single / multiple customer operation</td>
<td>In parallel operation for multiple customers</td>
</tr>
<tr>
<td>Payment model</td>
<td>Payment model</td>
</tr>
</tbody>
</table>

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 7 – Classification of possible BM**
(adapted from Kohler et al., 2009, Tukker, 2004)

<table>
<thead>
<tr>
<th>Focus on Product</th>
<th>Pure Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on Services</td>
<td>Pure Service</td>
</tr>
<tr>
<td>Use Oriented</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRODUCT LEASE: periodic payment of the delivery of specific products/parts/</td>
</tr>
<tr>
<td></td>
<td>PRODUCT POOLING: coordination of the manufacturing process according to the demand of multiple clients</td>
</tr>
<tr>
<td></td>
<td>OUTSOURCING MANAGEMENT: management/maintenance of the production processes</td>
</tr>
<tr>
<td></td>
<td>PAY PER UNIT: based on the average cost of operations</td>
</tr>
<tr>
<td>Product Oriented</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRODUCT RELATED SERVICES: after-sale services, maintenance, modification and personalisation, training</td>
</tr>
<tr>
<td></td>
<td>ADVICE AND CONSULTANCY: consultancy related to the optimization of process performance, technologies, process operativity and productivity</td>
</tr>
</tbody>
</table>

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 7, we offer a classification of possible business models obtained from 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 8. We hypnotised the creation of a new organization (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 8 – Functional representation of NBM

![Functional representation of NBM](image)

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 organization 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)

5. 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.
In Figure 9, 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 structuration 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 organization of the technology transfer or development processes, as the role of universities (and related research centres) loose 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).3

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 justify this position according to the literature exploring the BM as a market device, defined

3 “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)
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 over 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 organization 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 organization 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 1, 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.
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.

6. 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. Moreover, 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, from 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.

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7. REFERENCES


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