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SINERGIE-SIMA 2018 CONFERENCE

Transformative business strategies and new patterns for value creation

Extended Abstract

*Ca' Foscari University, Venice
Department of Management - San Giobbe, Cannaregio 873*

14-15 June 2018

Referred Electronic Conference Proceeding della Sinergie - Sima 2018 Conference
Transformative business strategies and new patterns for value creation
Venice, 14-15 June 2018
Ca' Foscari University, Venice

ISBN 97888943937-2-9

I Referred Electronic Conference Proceeding sono pubblicati *online* sul portale di Sinergie
<http://www.sinergiejournal.it>

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Via Interrato dell'Acqua Morta, 26
37129 Verona
www.cueim.it

Convegno Sinergie - Sima 2018

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Extended Abstact

a cura di

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Alberto Pastore e Tiziano Vescovi*

Business model innovation in complex servitized systems: the case of OBC in capital equipment SMEs

MARCO PAIOLA *

Objectives. *Cranes, off-road and on-road automotive industries have lately engaged in offering use-based services, in which the object of supplier customer relation is not based on a product, but on a service. Machine as a service (MAAS) and Output-based Contracting (OBC) solutions have appeared also in capital equipment production industries, that are far less glamorous than automotive world-class manufacturers, but are as well important in our local systems of production and innovation. These strategic movements are strictly related to the recent technological scenario. Nowadays, digitalization (and in particular technologies like IOT, Cloud platforms, Big Data analysis) is pushing innovative firms to use services in order to create entirely new business models, finally migrating from the product-centric approaches to (digital) service-oriented ones (Rymaszewska et al., 2017). Unfortunately, B2B firms recognize that the possibility of accessing richer sources of data specific to their customer is greater than ever, but they lack a clear and defined strategy that encompasses the use of those data (Lilien, 2016). The object of this research project is to study how digitalization has affected firms' business models, with a special attention to medium-sized capital equipment companies involved in Output Based Contracting. Little research work has been done to date on this topic, that has a disrupting impact on the aforementioned companies.*

Methodology. *As OBC is a relatively new research topic (especially if related to IOT), we designed an exploratory research based on a cross-analysis of a multiple-case study, using information coming from experts' interviews and selected case studies with the aim of getting detailed information regarding firms' approaches to the selected research topic. First data have been collected from several in-depth face-to-face semi-structured interviews with firms' key-informants like CEOs or top managers in charge of IOT-related activities. Those interviews are the initial part of an ongoing articulated investigation program that will have subsequent meetings in the forthcoming months. Research methodology is in line with prescriptions coming from well-known specific literature on case-study research (Eisenhardt, 1989; Yin, 1994). The empirical setting followed conceptual considerations, aiming at describing different challenges faced by SMEs (Miles and Huberman, 1994). The involved firms are all Italian manufacturing BtoB firms, that operate in industries and activities compliant to the research objectives. We deliberately excluded large MNEs.*

As one can notice (Table 1) the industries covered are: Packaging machinery, Pharmaceutical equipment, Refrigeration equipment, Confectionary machinery. Companies are very often characterized by segment or niche focalization, with a consequent specialization of resources, capabilities, product and services. Acknowledging the different roles firms can play in the often very articulated BtoB supply chains, we focused on BtoB OEMs firms with a direct sales model (Paiola, 2017), in order to be sure that the firms could boast a direct relation to the end user and any connection with its needs and wishes, and no intermediate subject could interfere with the fulfillment of the OBC.

Tab. 1: Empirical cases: outline of firms' characteristics

Position in the value chain	Sales model	Industries involved	Number and hour of interview	Interviewees roles
Original Equipment Manufacturers (OEMs)	Direct	Packaging machinery, Pharmaceutical equipment, Refrigeration equipment, Confectionary machinery	4 in-depth cases, 7 personal face-to-face interviews	CEOs, CTOs, CIOs, Marketing & Sales managers

Findings. *Connected products are transforming both business and consumer markets, making space for brand new data-based service-oriented business models (Porter and Heppelmann, 2014;2015). For many manufacturers, this is definitely the time for Business Model (BM) experimentation, especially regarding BM that traditionally don't belong to the manufacturing culture, such as service-based ones. Recent literature identifies three service-based approaches that may change the classical equipment provider role of OEMs: availability provider, performance provider, solution industrializer (Kowalkowski et al., 2015). In the new landscape, companies which succeed in extending the service*

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business are the ones that obtain comprehensive information on customer needs and use them to reshape their strategy. Traditional methods of obtaining such information (wide-ranging market research, workshops with selected customers, etc.) - that have always been important sources of ideas for developing new services (Gebauer et al., 2005) - are now being transformed and amplified by the nature and the magnitude of new sources of business information such as IOT.

In particular, the impact of a transition toward use-based business models and especially OBC and MAAS contracting entails the following modifications in companies' strategies:.

From smart products to smart services: Digital, information rich, in a word "smart" products impact on firms' strategies basically for the smart services they are capable to origin and supply (Allmendinger and Lombreglia, 2005). It is not a case that a goods-based concept as Internet of Things has recently been paralleled by a new and intellectually intriguing concept of "Internet of Services". Digitalization of products may actually introduce a new breed of both the types of BtoB services we introduced earlier. As regards the services supporting the customer (SSC)'s side (Mathieu, 2001), use-based business models based not on the property and simple access to machines' functions, but on specifically contracted notions of performance associated with the use of the machine, such as process optimization services, business optimization services and business transformation services are gaining importance. In this field IOT and related technologies are acting as business innovation engines, and are going to call for a lot of firms' investments in the forthcoming years (Noventum, 2016; SAS, 2016). When manufacturers are offering OBC and MAAS, the traditional practice of making profit by transactional sales of spare parts and product-related services are no longer viable (Windahl and Lakemond, 2010). The servitization literature shows that profitability is transitioning from "transaction-based product business" to "relationship-based service business" (Oliva and Kallenberg, 2003), and from ownership-based business models to use-based ones. The latter questions are connected with different other topics, beginning from the following, that is the transition of firms' business models.

Business Models innovation: Starting from a comprehensive study that lists 55 inter-sectorial Business Models (BM) (Gassmann et al., 2014), Fleisch et al., (2014) have selected the ones that are going to be influenced the most by IOT technologies. In particular, BM archetypes as Guaranteed Availability, Pay per Use, Solution Provider, and Performance-Based Contracting are supported by the functions of remote usage and condition monitoring available via IOT. BM transformation poses serious challenges to firms: a strategic model has to take into account major impacts on value drivers such as efficiency, complementarities, lock-in, and novelty—and the linkages among them (Amit and Zott, 2001). Changes to business model - even when not disrupting - can lead to conflicts with supply chains configurations, and the resistance to experimentations that different firms may oppose to change, and with previous technologies (Christensen, 1997). In addition, corporate cognitive functions of selecting and valuating information about new BMs are based on the dominant logic of old successful ones (Chesbroug, 2010), potentially leading to miss potentially valuable uses of technologies. Firms use to face the complexity of the transition with pragmatism: the impact of digital technologies on different areas of the business model (such as the value proposition), can be projected to be managed in a three-scale gradual impact magnitude, that is enhancing, extending and redefining the existing firms' business models (Berman 2012). Regarding what are the elements of a business model, Osterwalder and Pigneur (2010) developed the Business Model Canvas, that has become a well-established framework for practitioners and firms to describe their business models and analyse them in order to find new strategic alternatives. The model is composed of nine building blocks, that cover the different types of firms' economics, from marketing to production to finance, namely: Value propositions, distribution channels and customer relationships; key resources, key activities and key partners; revenue streams and cost structure. This model has been used to rethink strategies by large firms all over the world, and will be the base of some considerations also in this paper later on. To deliver Outcome-Based Contracting firms have to shift from the traditional product based model to an outcome business model, that is a particular case of use-based business models (Visnjic et al., 2017). OBC as a target business model for BtoB OEMs in the capital equipment industry can be with no doubt valued as a redefinition of the BM, that impacts on every building block. In particular, the modifications of BM affect firms' internal and external processes and interdependencies, especially involving reconfiguration of internal capabilities, value and pricing models, revenue and cost structures, and power and collaboration in the value system (Vendrell-Herrero et al., 2017).

Supply chains positions and ecosystems: Digital transformation has affected and changed the value created by different parties in the offering (Arnold et al., 2016). In many different industries, the use of data coming from sensors embedded in machines and products is enabling new forms of relations with key clients. Some years ago, Wise and Baumgartner (1999) encouraged companies to look at the value chain from the customer's perspective, in the effort of seizing and exploiting downstream opportunities for creating new product and service concepts. The "downstream gaze" of many popular cases of servitization involving large companies has highlighted the increasing importance of downwards activities that traditionally have been neglected or underestimated by both OEMs and distributors (Auramo and Ala-risku, 2005). In OEMs' service-led experiences, it is not uncommon to run into the parallel phenomenon of "Horizontalisation", that is the need to build competences to be able to service also competitors' products (Bundschuh and Dezvane, 2003). This horizontal movement - that adds and leverage on the vertical direction of "going downstream" - often calls in turn for an additional scouting of specialized third-party service providers, contributing to substantiate mature digital transformation processes as complex and interrelated ecosystems of firms participating in the production of product-service systems, with the resulting outcome of an incremental need for new competences in managing the network of participating companies (Dahlstrom et al., 2016). Success increasingly depends on collaborating with other companies that have complementary competencies and co-capabilities (Batista et al., 2017), and individual companies no longer compete alone but rather as supply chains or ecosystems.

Mindsets, competences and financial challenges: *OBC has massive implications for many traditional marketing management frameworks. Firstly, adopting advanced service-based business models, firms have to cope with new notions of ownership and asset management (Neely, 2008 p. 105). Modern real-time KPIs measurement in operations management, along with the ubiquitous nature of data guaranteed by communication technologies, allow firms to make some moves into performance-based business models (Huxtable and Schaefer 2016). In fact, new business models bolstered by data collection and information processing need also new capabilities. Gebauer et al., (2017), for example, identify three organizational capabilities for pay-per-use services: (a) financing pay-per-use services, (b) aligning costs to product usage, and (c) collaborating with customers. In fact, in OBC companies focus on solving problems from the customer's perspective. When a company commits in such an activity, it assumes the (high) risk of achieving a certain output as the basis for compensation (Reinartz and Ulaga, 2008). Consequently, the pricing of the new services should be based on a deep knowledge of the product, its pros and cons, and on an accurate calculation of the products' range of optimal activity and use. Pricing strategies are therefore strictly interrelated with contractual details, and represent an important operational topic on which manufacturing firms have to experience. In addition, servitization implies that firms won't simply sell products. Instead, long term contracts with customers are signed, changing consequently the nature and timescale of market relationships. Thus, servitization involves a shift from transactional to relational marketing, and companies may not have the competences necessary to deal with this new situation satisfactorily and different organizational adjustments have to be put in place in order to cope with this problem. Technological platforms may also be at the base of new relations with customers, with a peculiar role being played by information modules, as core elements for successful servitization alongside products and services (Cenamor et al., 2017). Servitization represents also a compelling challenge for companies' sales functions, since it can change the mere nature of what is being sold: this may give birth to some culture - related issues. In fact, one of the reasons manufacturers may not be able to make service activities as profitable as expected, is that they tend to use services as "incentives" to sale. Being crystallized in the supplier – customer relation mechanisms, this habit can therefore constitute a strong resistance to change (Neely, 2008). Furthermore, there is also a question of scale of the business, that leads manufacturers to compare new service contracts' impact to that of the traditional product selling. In Gebauer et al., (2005) words, "they do not see the sale of a \$50,000 service contract, as compelling as the sale of a \$1 million machine". Finally, timescale-related challenges are connected to the specific contractual relationship often implied by servitization: complex PSS and solutions often make firms engage in multi-year partnerships (Davies et al., 2007), with the consequent need of being able to manage and constantly monitor risk and exposure.*

The case for Medium-sized Enterprises peculiarity: *Unlike large corporations, SMEs call for a specific treatment when it comes to deal with their specific challenges and behavior in servitization (Gebauer et al., 2010). Firstly, minor enterprises are less certain about what their business is going to become and what will their position be in the new scenarios. In fact, the need to continue to perform well in the current business while simultaneously conducting the experimentation of new BM is particularly challenging for smaller firms. In addition, the earnings coming from the new experimental models are far less than those coming from established ones and that is an additional reason that calls for caution. Also the professional competences inherent in activities such as big data analysis, highlight a critical competence gap for SMEs. Those changes are particularly challenging for minor firms in financial, organizational and strategic terms: their limited resource-base and their market position allow them to deal with IoT-based innovation in a way very different from large firms (Laudien and Daxbock, 2016). As previous studies have pinpointed, other relevant critical points may arise in relation to the distance from the end-customers, the type and nature of distribution channels and the articulation of the value chain, in which frequently SMEs have limited bargaining power and need to orchestrate ecosystems of partners in order to fill capability gaps, and add value to end customers (Gebauer et al., 2013; Paiola et al., 2012). Unfortunately, this may be far outside the comfort zone of many manufacturers. In particular, literature has pinpointed the main requisites of SMEs supply chain strategies, underlining aspects like their need of guidance in strategic planning, the opportunity to focus and excel in a restricted number of activities and capability, the critical importance of decision-making capabilities and the need of constantly monitoring and modify if needed their competitive positions to respond rapidly to changing conditions (Lim et al., 2006).*

Practical implications. *The field research led us to observe some of the transformations described in the literature at work. Firms are offering services that can be the base for new value-added offerings: predictive maintenance, warranty modelling, consumption control, energy savings, and customized utilization of the product. In some cases, MaaS concepts (Machine-as-a-Service) are being introduced, with a completely new billing system based on equipment's efficiency (better uptime and improved process efficiency) or actual rate of utilization. In these cases service BMs experimentation has led to a completely new (and deeper) relation with key clients. On the whole, the transition poses different challenges to SMEs, regarding their ecosystems, their business models and their strategic marketing decisions.*

Positioning strategies in the value chains: moving downstream: *As far as value chains positioning strategies are involved, our research shows a clear tendency of OEMs to look downstream to the final user firms. Many companies are trying to regain direct contacts with final-user firms de-intermediating distribution channels, and designing more customized services or even completely new solutions. Unfortunately, BtoB marketing strategies of minor firms have not always been forward-looking, and very little concern has thus been directed to post-sale services is perceived as burdensome and preferably outsourced to third parties. In this picture, the real occasion to stay in contact with the customer is to be "reinvented", in order to make some steps downstream. Managers feel they have no choice than*

developing new capabilities in order to upgrade their patrimony. On the one side, they are turning to the old servitization's school imperatives, such as leveraging on their existing Installed Base in order to find a way to convey new services and nurture new relations; in this area they end up realizing the need for new competences such as marketing capabilities regarding the management of the relations with end users. On the other side, they are beginning to look differently and with much more attention to their supply chains, in order to seize useful competences and crafting an ecosystem of partners to involve in the strategic change. Finally, and quite surprisingly, even the players that are close to the end user firms have a strong resistance to take digital transformation seriously. Frequently the feelings managers have in this transition phase are disarming: "Our strategic vision is partial, we do not have a clear idea of the role we could play in the value system". This is to be connected to cultural and the industry dominant logic prevalence, that prove to play an important role in the transformation.

Business model innovation: As regards the challenge of manipulating the firm's business model, it is definitely an activity perceived as difficult and risky, and very often firms don't even possess the internal capabilities to face such a difficult task (here the importance of external KIBS). In any case, firms that have made some experiences with new business models, are trying to integrate them in the traditional strategy, ending up in building a "multi-model" strategy. The ability of crafting a strategy in which different business models and approaches coexist is definitely a critical capability in this phase. New business models experimentation regards the previously labelled "digitally charged" ones: simpler and viable modifications are dealt with first, and big changes are subsequent, showing some initiative in solution provision. The connected Installed Base (IB) allows the firm to envision the creation of a large data base regarding customers' use of selected product-lines, that in turn can be the base of new product and service development in the future, such as razor and blade and lock-in models, or even performance-based and use-based services. As a general rule, the initial approach to the transition can be defined as defensive or at least reactive. Even if the potentialities of a deep use of data for the business are quite clear for the management, at the very beginning firms approach the envisioned investments with a pragmatic attitude, improving in the first place basic product or service areas like warranty control or product optimization, remaining in a well-known environment and leveraging on capabilities they possess or can control. In one case packaging machines are being equipped with TCP/IP protocol and WIFI gateways in order to access cloud services, that are at the moment used to initiate maintenance ticketing and warranty management support. In other case the same technological outfit is the base for more sophisticated experimentations, like in the case of a performance-based contracting relationship with key-clients with remote equipment management and remarkable productivity gains contractually granted (and honored). Table 2 briefly reports preliminary findings related to BM modifications.

Tab. 2: Business Models (BMs) change

Position in the value chain	Sales model	Industries involved	Problems	Solutions
OEMs	Direct	Predictive maintenance; Guaranteed Availability; Performance-based contracting; Solution providing.	Lack of CRM capabilities Corporate identity crisis	Capability sourcing; Experimentation.

Marketing strategies modifications: In many cases, the major consequence of business models transition has been the change of the type of the customer and the nature of the relationship underneath. Some advanced experimentations that have been able to reach the final user firms with a digital-based value proposition, suffer in fact of an "identity crisis" due to the clash between the traditional manufacturing identity and the new role that calls for multiple and direct interactions with final users and requests competences and resources they don't possess. A new world of pricing strategies and contractual editing is opening up for companies that are exploring use-based and performance-based business models. For example, in one case a capital equipment supplier (OEM) engaged with a key client in order to guarantee given levels of overall equipment efficiency (OEE), assuming all the risks of not being capable to reach the promised performances. That completely changed the context in which such company was used to manage customers relationships, that until that moment were based on the sale of a product and some ancillary pre and post-sale services. Firstly, the object of the sale changed, and that was a big change from an ownership-based approach to a use-based one. Secondly, the need to operate its own produced machines instead of the customer and on behalf of the customer, changed the timescale of the relation: that circumstance had to be negotiated as well as other terms like price levels. As regards pricing, in this case, at first an experimental price fixation has been put in place, but having no experience the prudential level of guaranteed output revealed to be poorly fixed. The OEM needed to re-negotiate it since the productivity gains registered were much higher than forecasted and this would have seriously penalized the supplier. The client-company was finally willing to re-negotiate contractual agreements regarding price, recognizing the value and preciousness of the supplier's capabilities. This circumstance testifies for the fact that in digital servitization, like in more traditional servitization processes, pricing strategies are strictly interrelated with contractual details, and represent an important operational topic on which manufacturing firms have to experience: being able to face the (inevitable) pitfalls that characterize the first steps in this new world is a matter of loyalty and fairness of supplier-customer relations.

Research limits and Originality of the study. *The study presented in this extended abstract - although not permitting consistent generalization - has valuable impact both on theory and practice. In our research, we underscored different problems that SMEs face in the adoption of advanced use-based business models, like OBC and MAAS. Those advanced and complex projects are in place or are being explored and studied by OEMs with direct contact with end-user firms, due to the valuable opportunity of changing and upgrading the relation with the customer. IOT-based process optimization services or initial IOT-based business optimization services are being experimented in some restricted nonetheless already durable projects. As a final note, we underline that digital transformation is not perceived as a mere technology phenomenon. As one CEO said: "it all depends on the customer: if he hasn't changed his business model, no or little appreciation of innovation efforts will be encountered by OEMs". Future research will concern the deepening and enlarging of the sample at the base of the present work.*

Key words: *Digital transformation; Service Business Models; Output-based Contracting; Capital Equipment; SMEs; Italy.*

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