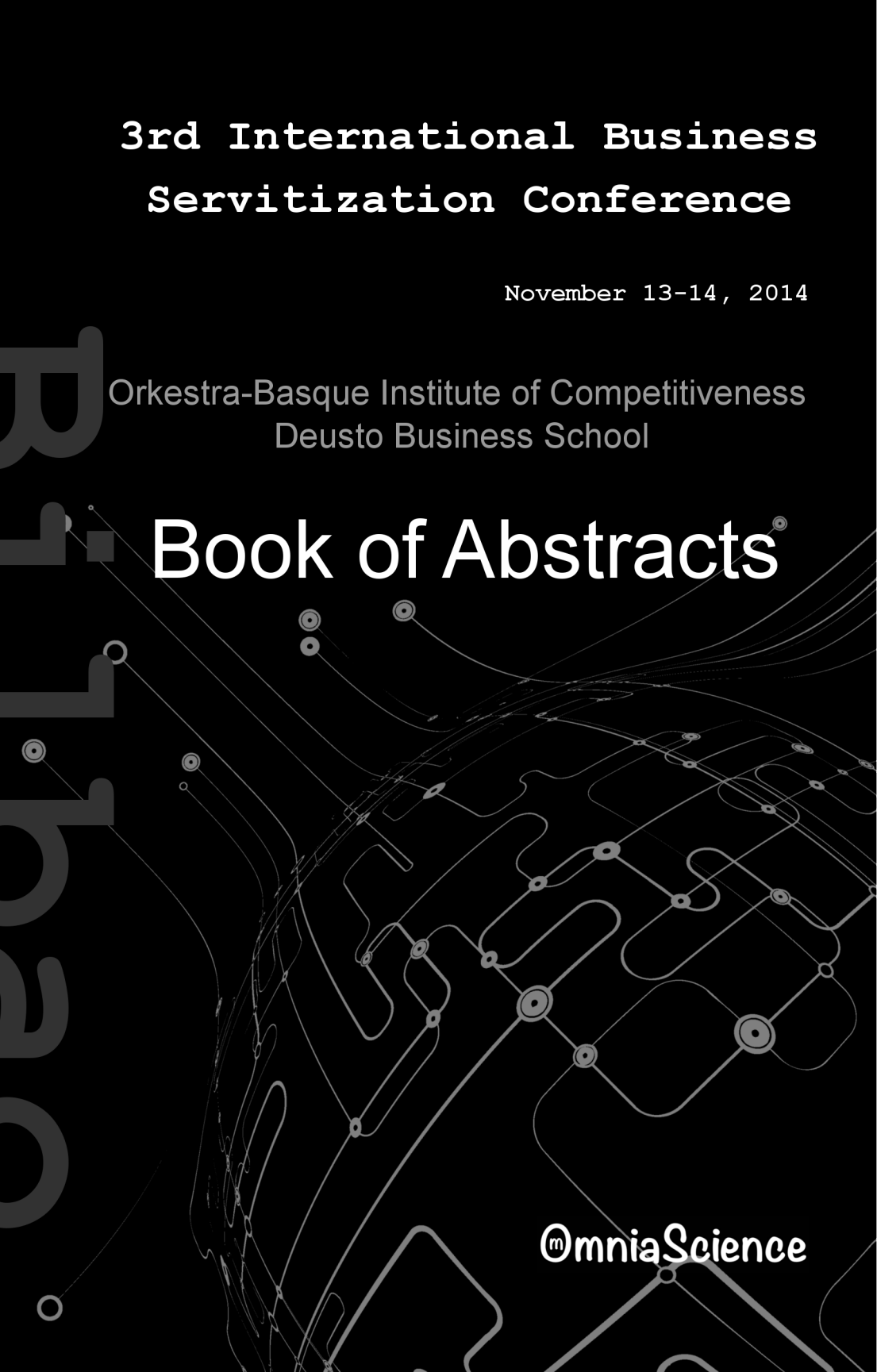
3rd International Business Servitization Conference

November 13-14, 2014

Orkestra-Basque Institute of Competitiveness
Deusto Business School

Book of Abstracts



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Foreword

3rd International Business Servitization Conference

The International Business Servitization (IBS) Conference celebrated its 3rd edition on 13-14 November 2014 at Deusto University in Bilbao (Basque Country, Spain).

Organized by Orkestra-Basque Institute of Competitiveness and backed by the Deusto Business School, some 75 researchers, practitioners and policy makers gathered to present and discuss contemporary trends and phenomena in the realm of servitization.

The 3rd edition had as overarching theme: "Servitization and advanced business services as levers for competitiveness", and the day-and-a-half programme attracted participants from across the globe (European member states, North America, Oceania).

Apart from the presentation of papers –whose abstracts are gathered in the present document, there were keynote speeches from Prof. Tim Baines (Aston Business School - Birmingham, UK, and an authority in the field of business servitization) and Mr. Julen Barrutia, as representative of CAF (a railway system designer and manufacturer with its home base in the Basque Country, and an early adopter of servitization principles in its business model).

We are confident that this bundle of abstracts provides interested readers with baseline information on the works presented and discussed at the 3rd IBS conference, and with contact details of the respective authors for eventual follow-up contact.

We also trust that the 3rd edition of the International Business Servitization Conference leaves a positive legacy in the form of solid fundaments for further networking among the servitization research community and a fertile ground for next editions of this conference series.

A big thanks to all that made the 3rd International Business Servitization Conference in Deusto, Bilbao such a fruitful and gratifying event.

Ikusi arte!

On behalf of the organizers:

Bart Kamp

Conference Chair

Organizing Committee

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PRESENTED AT

3RD INTERNATIONAL BUSINESS SERVITIZATION CONFERENCE

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Thinking products in a different way: What is needed for product servitization

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Abstract

Latest advances in Information and Communication Technologies like smaller and smaller electronics, the data and services available in the Internet, the Internet of Things, Big Data and finally Cloud Computing are some of the engines for innovation. These advances allow to embed processing power, software and thus intelligence in any product as well as to connect products to the Internet. These advances allow the creation of Product-Service Systems that are at the intersection of software, smartization and servitization. This paper will go deeper in the characteristics and the differences between designing, manufacturing, selling and maintaining product-service system and traditional products.

Initiallly, innovation was concentrated in products easy to digitise, such as music and advertising. Companies like Apple with its iPhone have created completely new products with new business models offering a completely new type of services. Other companies, like Amazon, have combined physical and digital services with a great impact on traditional business models. Amazon is a good example of physical products being sold in a digital marketplace with excellent logistics, to take the products to your home, and secure online payments. This has had a lot of impact on traditional business models.

The services offered by these companies are characterised by the:

- Internet (web) with standard meaning among users and services and stardard cooperation among systems.
- De-allocation (cloud) in fix and mobile environments with the separation between data and applications, and production and exploitation almost instantaneous.
- Multi-purpose (evolutive): software defined service platforms composed by systems of systems that are adaptable, expandible and personalised.

The innovation offered by the combination of software, smart and services can affect a whole range of other industries with more traditional products. Now products like cars or the smart grids are examples of how these innovations are starting to affect more traditional products. It´s possible to say that this combination is the basis for new products offering new services and changing business models that could have a disruptive effect in well stablished markets.

Smartization and servitization aspects can be now implemented in locks, smart meters, smart lights, lifts, vehicles, machine tools and in any product that one can imagine. This has a great impact in how these products are designed, manufacturer, sold and maintained, but has also a lot of impact in who are the suppliers, with the appearance of new players and the dissapearing of others, but moreover in a closer relation with the clients. Clients will expect the satisfaction of their individual needs anytime and anywhere, influencing business in the Business-to-Business (B2B) market as well as the Businessto-Consumer (B2C) market. This way, all kind of businesses will need to address the impact of these changes on their own business model. A product is made by a manufacturer, using subsytems or parts that are provided by one or several suppliers, and finally is sold to a consumer. Although nowadays manufacturers' and suppliers' underlying business models are already supported by Web-based services, this is only for supporting the traditional way of doing businesses.

The smartization of products allows to sense reality to obtain data, analyse, infer, take decisions, act in the real world and learn, so we

can think about products, based in these new capabilities in quite a different manner, and being able to offer services linked to our products in a manner no thought before. These are product-service systems and making them has an impact in all aspects of the product life-cycle:

- Vertical point of view (manufacturer): Software, Smartization and Servitization allow increasing value per employee but there are substantial differences in the design, development and maintenance of product-service systems from traditional products.
- Horizontal point of view (supplier-manufacturer-consumer): Software, Smartization and Servitizaiton allow multiplying innovation and business, but supply chains are different in product-service systems and in traditional products.
- Circular point of view (manufacturer-consumer-manufacturer): Software, Smartization and Servitization allows a stronger connection with the client but inputs from the client as well as their feedback are obtained in a different way (habits capturing, training, e-concepts tests, user communities, …).

Implementing product-service systems need to put into practice different skills. Creativity, experimentation, the desire to take risks and flexibilty are crucial aspects if we want to take the pace of innovation in this area. There is also a need to complement actual teams, mainly formed by people coming from the engineering, physics, computer science and mathematical fields, with people from the anthropological, design, arts, social sciences and linguistic fields. Only multidisciplinary teams will be able to think about new product-service systems and to put them to work in a successful manner.

Finally, it is important that existing industries do not perceive these changes as a threat but as an opportunity. Only in this way will these companies take full advantage of this new era, being active part of the development of new products and services, instead of only watching what others are doing and reacting too late. Product-service systems are a great opportunity that no industry can allow to miss.

Índice

The bumpy servitization road upstream in the value chain: Strategies, enablers and barriers

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Abstract

Companies are moving towards servitization when the offering of services becomes a new fundament for growth. Servitization or service innovation is considered a successful alternative to more "classic" yet highly competitive forms of product or technology innovations (Gebauer, Worch, & Truffer, 2012; Markides, 2006) and is often linked to the concept of business model innovation (see for instance, Kindstrom & Kowalkowski, 2014; Bezerra Barquet, de Oliveira, Amigo, Cunha, & Rozenfeld, 2013; Storbacka, Windahl, Nenonen, & Salonen, 2013). Also, increasing commoditization forces companies to deliver more value to customers (Matthyssens & Vandenbempt, 2008). Value addition often necessitates a move towards servitization.

Servitization is nowadays a prominent focus of capital goods manufacturers and original equipment manufacturers (OEM). These companies push towards new value in services and integrated solutions through higher degrees of customization and less tangible offerings. The literature (see for instance Ulaga & Loveland, 2014; Baines & Lightfoot, 2013; Visnjic Kastalli & Van Looy, 2013; Bezerra Barquet et al., 2013; Matthyssens & Vandenbempt, 2010, 2008) focuses on describing (1) how these companies move from a product offering to service offerings, (2) how these servitization strategies are often enabled by new technology, and (3) the identification of market and organizational enablers and barriers to servitization. Matthyssens & Vandenbempt (2010) for instance

describe different transition paths that machine builders can follow in order to evolve from offering basic after-sales services to becoming value partners. In the commoditized electro-technical industry a similar evolution can be found; Matthyssens & Vandenbempt (2008) describe concrete efforts of suppliers to make the transition from basic products to service-based solutions. Furthermore, Bezerra Barquet et al. (2013) propose a business model framework for the investigation of different scenarios to help adopt product-service systems (PSS). Concerning new technologies that enable servitization strategies, Baines & Lightfoot (2013) for instance reveal six technologies and practices that successfully servitised manufacturers employ in the delivery of advanced services, among which are the micro-vertical integration of supplier relationships and information and communication technologies (ICTs). Concerning market and organizational barriers, Matthyssens & Vandenbempt (2010) for instance describe a number of external and internal inhibitors, such as market fragmentation and customers' unwillingness to collaborate (external) and a lack of deep customer insight and existing attitudes (internal). Also, Ulaga & Loveland (2014) identify potential challenges to firms in their transition to service-led growth and describes four major transition issues regarding their industrial sales forces, among which the magnitude of change at the sales organization level and the unique elements of selling hybrid offerings versus industrial goods. Furthermore, Visnjic Kastalli & Van Looy (2013) analyse the implementation hurdles that lead to potential performance decline, the so-called 'servitization paradox', and investigated a company that is able to transcend these hurdles.

Yet, specific issues encountered by suppliers upstream in the value chain (first-tier, second-tier, etc.) while transforming towards servitization are often overlooked. According to Matthyssens, Vandenbempt & Weyns (2009), subcontractors in the steel and metalworking industry are convinced they can only survive if they find ways to continuously add value to their offerings, yet find it difficult to make an effective migration from a simple service provider to value-added solutions provider. The authors identified specific competence configurations related to 'ideal' value-added market positions, and revealed the need to manage co-evolution

with network partners. Secondly, besides upstream suppliers, little is also known about the process to servitization in small and medium-sized enterprises (SMEs). Kowalkowski, Witell, & Gustafsson (2013) suggest that there is no predefined transition process for service infusion in SMEs, which seldom have the resources to build new organizational units or create new specialities. Similar to the study by Matthyssens et al. (2009), Kowalkowski et al. (2013) found that SMEs could differentiate themselves through new value constellations within business networks. Thirdly, it is less studied how the servitization trend with capital goods manufacturers and OEMs impacts the business strategies of suppliers upstream in the supply chain. What does servitization mean when supplying components, production capacity and capabilities or submodules, and what is the organizational impact for these suppliers?

In sum, more research is needed on how and to what extent suppliers (to OEMs and capital goods manufacturers) are dealing with servitization. For this reason, we aim to research the strategies, enablers and barriers of (small and medium-sized) suppliers upstream in the value chain in their transition towards servitization. We specifically want to find an answer to the following research questions:

- What are the alternative strategies for small and medium-sized suppliers in their process towards servitization?
- What internal and external enablers and barriers do they encounter in the servitization process?
- How can they overcome these barriers and implement their strategies successfully?

For this research, we perform an embedded case study research (Yin, 2009) involving two types of small and medium-sized upstream suppliers. First, we include metalworking subcontractors and/or component suppliers, which are “internally induced” to evolve to service innovation towards their OEM customers. Second, we include foundries, which through innovative technologies (“externally induced”) such as 3D simulation and other knowledge-intensive business services (KIBS) are theoretically able to co-develop, co-engineer and co-produce new metal castings for their

customers. Through the authors' current research projects on "Foundries of the Future" and "Factories of the Future" for Belgium's largest employers' organisation representing the technology industry, we include 4 tot 6 SME suppliers in our research. Our interviews so far are in line with the literature overview above. Furthermore, foundries demonstrate problems in co-creating value with customers, irrespective of their size and notwithstanding new enabling technologies. In the component supplier industry similar problems occur. On the basis of these interviews, a preliminary pattern and typology seem to pop up from the data regarding suppliers' strategy, enablers and inhibitors towards servitization. Through the embedded case study approach we are able draw evidence from more than one unit of analysis to add breadth and depth to data collection. This approach is also preferred when relevant behaviours cannot be manipulated and the boundaries between the phenomenon of interest and context are not clear (Yin, 2009).

Keywords: Servitization, Co-creation of value, Suppliers, Service.

Índice

La integración de la cadena de suministro como elemento clave en la servitización: El caso de la industria manufacturera vasca

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Abstract

Objectives: Las relaciones empresariales desempeñan un papel crítico en el proceso de servitización de la industria manufacturera. La evolución de las necesidades de los clientes hace que la relación fabricante-cliente vaya más allá de la transacción comercial. El modelo de negocio tradicional basado en la expresión del valor a través de las características y funcionalidades del producto está quedando atrás en favor de propuestas de valor integrales. De esta manera, al producto ofertado se incorporan aspectos relativos al mantenimiento y servicio postventa, tiempos de entrega, actualización en función de futuros desarrollos… que suponen un valor añadido diferencial respecto a la competencia. El objetivo es fidelizar a los clientes existentes y captar nuevos para mantener o incrementar su competitividad. La capacidad de responder, si no adelantarse, a las necesidades y deseos de los clientes trasciende de la capacidad de una empresa. Así, la habilidad para generar mayor valor para el cliente, depende también de la adaptabilidad del resto de su cadena de suministro (CS) a las nuevas exigencias competitivas. En este sentido, las relaciones tanto con clientes como con proveedores se constituyen en un aspecto que puede facilitar la capacitación de la empresa para la servitización de su oferta.

Este trabajo estudia el papel que desempeña la integración de la CS en el desarrollo de capacidades que permitan a la empresa ofrecer un valor añadido a los productos que comercializa. Asimismo se

estudia el impacto de estas capacidades sobre los resultados empresariales.

En este estudio la integración de la CS se define como la colaboración estratégica de los procesos intra e inter-empresariales que dan lugar a una organización de la cadena más cohesionada. La integración se analiza desde una perspectiva multidimensional que integra la relación interna, con clientes y proveedores. La servitización se analiza desde la cultura empresarial orientada al cliente y al servicio donde se contemplan capacidades relativas al entendimiento y aprovechamiento de la información del mercado, la innovación en marketing y ventas, así como las relativas a la mejora de la flexibilidad y capacidad de respuesta al cliente. Por último, con los resultados empresariales se recoge el rendimiento operativo de la organización a partir de resultados de su posicionamiento en el mercado e indicadores económico-financieros. Esta visión más cuantitativa se complementa con la satisfacción de los clientes y trabajadores así como la percepción de la imagen de marca de la sociedad en general.

Methods: El trabajo se fundamenta en un modelo construido a partir del análisis de la literatura en dos campos de conocimiento: la gestión de la cadena de suministro y la servitización. El modelo consta de tres conceptos: la integración de la CS, la servitización y los resultados empresariales. El modelo se valida con la información recogida mediante un cuestionario distribuido entre empresas manufactureras vascas. El cuestionario consiste en un conjunto de 31 ítems con respuestas en base a una escala Likert de siete puntos. La validación del cuestionario se realizó mediante un análisis de fiabilidad y análisis factorial. Las hipótesis formuladas en el modelo de investigación fueron contrastadas mediante un modelo de ecuaciones estructurales por el método de mínimos cuadrados parciales. El análisis se ha llevado a cabo de manera agregada y desagregada, de manera que se puede identificar el efecto de cada dimensión de la integración sobre el desarrollo de capacidades competitivas basadas en la orientación al cliente y al servicio.

Results/Findings: Se obtuvieron 111 cuestionarios completos. Las empresas participantes provienen de diversos sectores: aeronáutico (14), automoción (30), metal (51) y otros sectores (16).

El análisis descriptivo de los datos muestra como las tres dimensiones presentan un nivel de integración desigual, la integración interna es la mayor de las tres y la integración con los proveedores la menor. En lo que respecta al análisis de las relaciones entre los elementos que conforman el modelo de investigación, se demuestra que la integración de la CS tiene un impacto positivo y significativo sobre las capacidades que facilitan la orientación al cliente y al servicio. Del mismo modo se demuestra la relación positiva y significativa entre estas capacidades y los resultados empresariales. En el estudio del modelo desagregando las dimensiones de integración de la CS se observa cómo las dimensiones con mayor peso son la integración interna y la integración con clientes.

Implications/Conclusions: Este trabajo contribuye a la investigación sobre la integración de la cadena de suministro, en concreto se analiza su efecto sobre las capacidades para desarrollar valor añadido al portfolio de productos, servitizando su oferta y en el impacto de estas capacidades sobre los resultados empresariales. El trabajo empírico sobre empresas manufactureras vascas permite ampliar el conocimiento sobre el grado de implicación interno, con proveedores y con clientes en los procesos empresariales. Los resultados son también interesantes para la investigación de la estrategia competitiva, dado que se demuestra cómo el desarrollo de estas capacidades contribuyen a mejorar los resultados empresariales. La servitización implica el cambio de una cultura manufacturera históricamente orientada al producto a otra en la que todo gira en torno al cliente y al servicio. Este cambio además de cultural es estructural pudiendo llevar a una nueva configuración del propio modelo de negocio. En este sentido, estudios que demuestren la potencialidad de estas estrategias para el desarrollo de ventajas competitivas pueden suponer una motivación más para comenzar el cambio.

Keywords: Integración de la cadena de suministro, capacidades, orientación al servicio.

Índice

Servitization as a strategy for the development of more eco-efficient products and services

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Abstract

According to the ISO 14040:2006 standard, life cycle is defined as the consecutive and interlinked stages of a product system, from raw material extraction to final disposal stages.

Therefore, we can say that the LCA is, today, a methodology of established and standardised evaluation according to the ISO 14040 series of standards and widely used in the legislative development in comparative studies and in environmental communication; as can be seen through its use within the Ecodesign methodology.

This Ecodesign methodology takes into account all the environmental aspects at all stages of the product development process, striving for minimising the environmental impact of products throughout their life cycle and identifying, in turn, priority areas for action to reduce it and, ultimately, evaluating the environmental improvement achieved.

The use of Ecodesign has spread in the industrial sector in the past 20 years with great results in improving the eco-efficiency of products placed on the market, primarily by reducing the impact associated with the phases of use (more energy efficient equipment, with less fuel, etc.) and end of life (better compatibility of materials at the end of life, ease of disassembly, recycling, etc.).

In turn, its principles have inspired and have been favoured by the development of a number of legislative instruments, based on the concept of extended producer responsibility.

However, due to the voluntary nature that the application of this methodology affects the mode of action of a company, those measures that go against the core of their business model principles have not had much application, rather the opposite. This is especially relevant in relation to the strategies for optimising product life, dematerialisation during manufacture or application of a product - service system, since greater durability of a product threatens the traditional business model based on product sales, especially in the case of markets already heavily settled.

In fact, a priority action objective in the redesign of equipment has been energy efficiency, influenced largely by the mandatory labelling of energy efficiency, with the aim of replacing existing equipment with equipment more energy efficient but with short lives. This is supposed to be a better option from an environmental point of view, because, with low energy efficiencies, the time to counteract environmentally the change of equipment is less than 4 years.

However, as pieces of equipment are more efficient, as the Figure 4 shows, the environmental impact of the use phase is decreasing compared to manufacturing and the number of years required for environmental counteraction of the change is increasing, exceeding 9-10 years.

That is why durability acquires an important role, and the momentum of the same threatens the traditional business model based on selling products. So, in order to further reduce the environmental impact of goods and services that are produced and consumed, a change in the business model of companies is necessary, where servitization acquires a relevant role through the use of more efficient products.

From the point of view of value creation through economic activity, a gradual growth from those low value-added products (such as raw materials) to those business solutions aimed at solving customer's problems can be seen.

This abstract presents the work carried out in the Basque Ecodesign Center, an initiative of public-private partnerships in the Basque Country between the Basque Government through Ihobe and eight

of the largest industrial companies in the Basque Country, in the field of servitization.

With the experience gained in the development of Ecodesign projects, since 2013 a methodology to carry out a change in the business model through the development of products and eco-efficient services based on the concept of servitization has been developed and applied.

As a starting point, it is essential to move from product Life Cycle Thinking to customer needs Life Cycle Thinking.

Therefore, the methodology developed is divided into four intervention areas:

1. Service eco-system
2. Contributed value
3. User needs
4. Life-Cycle

And this one consisting of five action stages:

1. Strategic analysis
2. Approach and definition of possible services
3. Conceptualisation of the solution to be developed
4. Implementation of the solution

To highlight some of the elements described, in the conceptualisation stage different aspects for the definition of the business model are analysed, based on an approach that takes as its starting point the Business Model Canvas axes, developed in 2010 by Alex Osterwalder, to which three new elements are incorporated: competitive positioning, the strategy for sustainable growth of the business and the environmental performance.

Finally, it must be noted that all these aspects in the implementation phase are analysed from the dual perspective brought by the Life Cycle Analysis (LCA) and Life Cycle Costing (LCC), allowing the proposed end solution to be the optimal, not only from an environmental standpoint, but also economic. For this, a joint evaluation and prioritisation tool is used.

Índice

Innovation in the cooperation between KIBS and small and medium-sized enterprises:

An explorative study

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Abstract

Objectives: In regional innovation systems KIBS are considered as key for the transfer and distribution of knowledge. Different empirical studies showed that KIBS are mainly used as transmitter of innovation by large enterprises.

SMEs have more difficult access to capital and a higher risk aversion to buy services from KIBS. It was explained with the expectation of the profit that would be created out of the cooperation between SMEs and KIBS. In case projects with KIBS fails, there is a risk that the whole company struggles by the financial loss. It's important to announce that all the research that is done on cooperation between KIBS and SMEs rely on surveys that were mostly conducted at KIBS. The demand perspective of SMEs was not extensive part of the studies. So it is to say that both contract partners could profit from this cooperation. The use of KIBS by Small and Medium-sized Enterprises is hardly analyzed with respect on their influence of innovativeness (Muller 2001).

Methods: Since the topic has not drawn too much attention in the servitization literature an explorative research design. Thus, the purpose of this paper is to introduce a qualitative study about the use of Knowledge-intensive Business Services (KIBS) by SMEs and the innovative effects of this cooperation. 15 in-depth interviews with semi-structured questions with SME-manager of industrial and

handy-craft enterprises are main part of in this research and should give answers to the question how SMEs that already cooperate with KIBS could get more innovative. Therefore the answers are analyzed by a qualitative content analysis.

Results/Findings: The interviews will be finished at the end of August. First results intend that KIBS affect SMEs in the following way:

- Companies use more KIBS-services from other institutions than private KIBS firms like public research institutes, industrial associations
- The willingness to cooperate is depends on the understanding of the KIBS-service. New knowledge is just acquired when cooperating SME has a knowledge basis in the field of the demanded KIBS.
- Communication is central for the cooperation with KIBS. If projects with KIBS fail, there is a poor transfer of knowledge between KIBS and SMEs.

Implications/conclusions: That the cooperation of KIBS and SME can result in fruitful ways the understanding of use KIBS is necessary. It requires from all interacting actors certain behavior. From the SME-Management perspective it's important to emphasize on the aspect of communication with KIBS. KIBS need to be aware that SME's need to understand the innovative influence out of the KIBS-Service. To conclude with the state perspective, the support for KIBS and SMEs brings only substantial profit if you can expect that the cooperation between KIBS and SME is not only for once.

Índice

A step forward in the criteria for the inclusion of services in the business model of the company: Is the specialization between the customer and supplier contrary to PSS?

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Abstract

Objectives: To Since its inception the term servitization (Vandemerwe & Rada 1988) has been associated with adding value to a company's offering through the inclusion of services and intangible goods.

This process can lead to profound changes in the organization through the adoption of radical innovations that involve the creation of very different value propositions, such as the PSS-Product-Service System. Its more complex version refers to an integrated product and service offering that delivers value for the client in the form of results or ability.

Some authors like Morelli (2003), Wong (2004) and Baines et al. (2007) consider these systems the convergence point in the evolution of both the servitization of goods (or products incorporating services) and the productization of services (or products incorporating services).

The concept of PSS is related to the pursuit of competitiveness through customer satisfaction based on changing business models from the first definition (Goedkoop et al. 1999).

These new business models include both products and services in their value proposition, and in turn tangible and intangible

elements; such hybrid configurations are becoming a key element for obtaining and sustaining competitive advantage. Therefore, the more mature the sector is, the more potential this concept has, as competitive rivalry usually hinders the creation of sustainable competitive advantage.

The idea of servitization was developed further by Neely et al (2011) who identified five underlying trends in the shift to services in relation to complex engineered products, which were: products to solutions, outputs to outcomes, transactions to relationships, suppliers to network partners and elements to ecosystems. This change does not involve substitution but complementarity; solutions are complementing products, relationships transactions, and so forth. Providers of complex engineered equipment must offer outcome or availability based contracts where the supplier guarantees the uptime and availability of the product. Consequently, companies go from being involved in 'transactions' to developing long-term relationships. An example referred to by many authors is Rolls-Royce engines and their pioneering approach "power by the hour".

Manzini et al (2001) draws attention to the implications of PSS design for the company, as it implies reasoning in terms of system in addition to breaking with business as usual.

Although PSS and servitization can offer interesting opportunities for a company in the search for value propositions, in certain situations it is better achieved through product innovation or operational excellence.

The aim of defining a value proposition is to add value to the market you are targeting. Propositions are combinations of benefits and tradeoffs that are offered to the customer in competition with propositions of a similar or different nature from other sources. The company should choose the combination of propositions that best fits its competitive business model.

This combination is not solely about adding services or benefits; sometimes it may be more effective to leave certain aspects to the clients to fulfill by themselves. Freije (1989) stresses that it should be left to the client to execute an activity that they can achieve to a

higher standard than the company can provide due to physical causes, better knowledge or best available resources. In recent decades there have been significant innovations in business models that are based on customer participation in the service such as IKEA or other low cost models.

Miles (2011) also emphasizes the role of the distribution of benefits between supplier and customer in innovation, highlighting that self-service is one of the most widespread methods, not only for their effects on costs, but also because it can improve quality and effectiveness in delivery to the customer. Focusing more on the process of innovation Von Hippel (2011) considers the increasing importance of users in driving innovation, not only when considering businesses but also individual consumers.

In this context this work focuses on an analysis of the criteria upon which specialization between supplier and customer is based, and also an examination of the circumstances that leads to PSS. Among the criteria to be considered are: best knowledge and specific technologies domain, the best ratio of costs and productivity, greater availability of the resources required, the difficulties of coordination of benefits (Freije and Freije, 2009), the difficulty and importance of trust between agents, the risks arising from the loss of uniformity in quality, and the appreciation of client participation or the potential individualized results for the client. The application of these criteria enables the identification of the most competitive combination, for the targeted market, from the perspective of customers. In turn, each criterion helps advance the relationship, between customer and supplier, to a higher degree of specialization and ultimately it has the potential to lead to a product-service system (PSS).

Methods/Results/Findings: Each of the seven aforementioned criteria will be developed in terms of their relationship to the degree of specialization, and conversely, those that will benefit from the configuration of a Product-Service System.

The objective of this paper is to develop a framework for defining the combination of products and services, tangible and intangible benefits, which will define the competitive advantage of the company, ie. the basis for establishing the business model. The

content of the work is currently conceptual in nature; this will be enriched by the discussion at the conference and will ultimately be empirically tested.

Implications/Conclusions: The research identifies critical issues regarding the definition of the company business model including the appropriateness of product-service system. Apart from the relevance of the systematic approach, it also enables a first step in its application to clients and may extend to other stakeholders.

Keywords: Servitization, PSS, Product-Service System, business model.

Índice

Obtaining competitive advantages through servitization process in project based firms

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Abstract

Objectives: Servitization Strategy is becoming increasingly important within business model structure in different sectors. However, most of the current literature focuses on the study of this phenomenon in manufacturing. Project-based companies (PBFs) have a great importance in developed economies and their impacts are present in many different industries as: construction, architecture, IT, oil & gas, energy, naval, etc. Business models in PBFs have its own particularities and differ from traditional Business models. The main objective of this paper is to contribute and increase the knowledge about the implementation process of servitization within PBFs and how these firms obtain competitive advantages through the services associated with projects. To achieve the objective of this study we will focus primarily on two main issues: first, we will make a thorough review of the literature in this type of companies to determine factors and characteristics that may favor a successful adoption of servitization. Secondly, based on existing frameworks for business models in PBFs, we will study the use of monitoring technology and new technologies of data gathering as associated services which can be included both during project development and during operation and maintenance phases. The ultimate achievement will be to find competitive advantages that could be

obtained through this process of monitoring and from the management of real-time data via cloud computing such as the benefits which may bring to both; customers and companies. Finally we attempt to study how the feedback process derived from data management supplied for these new technologies during each different phase of business projects positively affects subsequent development of future projects.

Methods: Firstly, a specific literature review in project-based firms, servitized business models, monitoring technology, cloud computing and internet of all things will be carried out. Then, we attempt to provide a strategic framework for future business development based on services in this kind of firms.

Results/Findings: In the first place, we expect to provide a list of characteristics for project-based firms which favoring servitization in this activity sector. Characteristics of these factors could let managers to better know if their firms present the necessary requirements to successfully face this process. In a second step, we are going to present all competitive advantages derived from the adoption of monitoring services in projects business. We also delve into studying how the management of the data obtained through this monitoring process improves the activities of design, development, maintenance and operation of the project. We attempt to show that an accurate data management will increasingly adjust the project to the environment and to the customer demands.

Implications/Conclusions: We propose that a proper implementation of servitization process in companies that base their activity on the development of projects generates positive differentiation from competitors. In order achieve it; a better understanding of the factors that favor successful servitization in PBFs will be a key. On the other hand, we try to show how the use new services based on monitoring processes and the use of new technologies able to gather real-time data during operation of the project will be a source of sustainable competitive advantages for this type of companies.

Keywords: Servitization, Project Management, Business models, Monitoring technology, Through-life management, Projet-based firms, Internet of all things.

Índice

The development of new business models from the automation of knowledge with virtual assistants and intelligent automation services

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Abstract

Objectives: This paper explores new business models emerging from the automation of knowledge with virtual assistants and intelligent automation services. The objective of this paper is twofold, firstly the author will analyze in detail the reasons why these systems can be considered radically innovative and different to current Technology Based Self-service Systems (TBSS) and secondly the author will analyze advanced business model innovations in the light of disruptive innovation.

Rationale: In the 1960s the potential of Technology based self-service systems to complement or to replace personal services performed by human service employees was starting to be explored at a time when services were considered less important in economic value creation than commodities (Regan, 1963). Since then TBSS has increased its role due to advances in technology growth and the consumer acceptance of these technological interfaces (Bitner et al., 2000).

Anselmsson (2001) explained TBSS as "Any activity or benefit based on hard technologies that service providers offer so that customers can perform the service, or parts of the service, by themselves" (Dabholkar, 1994). The difference with traditional service is the aspect of who performs the service, the employee or the customer (Anselmsson, 2001). In the case of TBSS systems the service provider is a machine used by the customer in order to perform the service

him/herself making it possible to replace the human service employees who were necessary in traditional service delivery (Bitner et al., 2000).

Research has recognized the benefits of TBSS for customers including time and cost savings, greater control over the service delivery, reducing waiting time, a higher perceived level of customization (Meuter & Bitner, 1998), enjoyment from using the technology (Dabholkar, 1994; 1996), efficiency, flexibility, spontaneous delight (Bitner et al., 2000) and ultimately greater satisfaction (Meuter et al., 2000). Research has also found the benefits of TBSS for companies. TBSS reduces costs and provides opportunities to increase the speed of delivery, precision, customization, productivity, market share, customer satisfaction and customer loyalty and differentiate through technological reputation (Meuter & Bitner, 1998).

Almost three years ago, on October 14, 2011, Siri (an intelligent personal assistant and knowledge navigator) was introduced by Apple as a feature on the Iphone 4S. Since that date all the major IT firms are developing some type of activities with Virtual Assistants. Developments in knowledge automation technologies such as natural language processing (NLP) or voice recognition are changing the ways in which companies are interacting with customers. The latest technologies of Virtual Assistant´s (Vas) such as Cortana, Google Now, Sher.pa or the already mentioned Siri incorporate NLP, semantic technologies, dialogue control, domain knowledge and visual appearance. As a consequence these more sophisticated VAs can understand concepts, can act based on multiple questions in one sentence, support proactive sales and marketing efforts (upselling, cross-selling), include analytics and feedback management. These systems are able to understand and more important “drive and execute” services for the customer. Furthermore, new business models are emerging from the automation of knowledge with virtual assistants and intelligent automation services.

Experts argue that there will be an increasing need for data analysis and management for making our lives more productive and

enjoyable. This trend will nurture the wide-spread adoption of the technologies that are emerging will enable us to manage data overload by offering reduction of information complexity, knowledge decision automation, reasoning capabilities, service personalization and forging these capabilities together with a multitude of Omni channel sensory inputs and outputs. Other IT fields such as the Internet of Things or Big Data will be related to virtual assistants and intelligent automation services. Soon a fleet of branded virtual assistants will help you for informational and transactional needs in all the sector including retail, health, banking, travel, entertainment etc. The VAs will recommend you special offers that meet your profile and personal tastes using AI and geolocation. Furthermore these systems will alert and help you avoid problems (like a virtual angel). For example the system will be able to alert you if you are going to cross a street without looking properly and the system estimates that you can be hit by an automotive. Some companies are already working with these business models offering personalized services (such as Zite or Sher.pa). These apps will remember your personal profile and detailed settings, and will learn your behavior.

Methods: This is an exploratory research aiming to identify the development of new business models from the automation of knowledge with virtual assistants and intelligent automation services. Firstly, a review of the literature was undertaken. Secondly, semi-structured interviews were held with senior managers of several firms in the Virtual Assistants and Natural language processing, business innovation model and digital strategy sectors/disciplines. Finally, empirical evidence from market sources was brought together.

Results/Findings: The developments in knowledge automation with virtual assistants and intelligent automation services do not conform to a self-service perspective, where the customer uses the machine to perform a service. Instead, intelligent systems serve customers in a similar way to human employees and some companies are already working with disruptive business models offering personalized services.

Implications/Conclusions: There is little empirical research on developments and impact of new business models from the automation of knowledge with virtual assistants and intelligent automation services. This paper contributes this literature and supports a strategy focused on business model innovation. It also contributes to an emerging literature on how to migrate from a self-service logic to an intelligent service logic.

Keywords: Disruptive technologies, business models, automation of knowledge work, Internet of Things, Big Data, technology acceptance.

Índice

How service design supports manufacturing servitization

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Abstract

This paper aims to discuss how Service Design could contribute to manufacturing Servitization processes. Several authors have suggested Service Design as a potential method to support product oriented industrial companies towards service logic positions. However, the specific implications of Service Design Thinking approach in manufacturing servitization processes have not been sufficiently studied.

In order to debate these implications, first this paper analyzes different Service Design approaches and the specific challenges on service's design and developing for product oriented companies. These challenges are mainly related to customer relationships, pricing and financial flows uncertainties, organizational and cultural shifts, and changes on design, development and delivery processes.

Second, some practical cases on Service Design in manufacturing developed by Mondragon Unibertsitatea's Design Innovation Center (DBZ) trough Real Live Learning Labs are described. In this Real Live Learning Labs, teams of design and engineering students, under the mentorship of university researchers and industry professionals have use Service Design to create new Industrial Product Service Systems (IPSS) concepts for Mondragon Group's industrial companies.

Although more research is needed, these first experimentations show that Service Design contributes to manufacturing servitization at strategic, operational and marketing levels: (i) establishing

processes that are able to design combined product-service solutions focused on customer interactions and not just on technological artifacts, (ii) supporting organizational cultural change towards service logic positions via motivation, co-creation and communication tools, and (iii) making tangible the service offering to both, the customer (external) and to the organization's staff (internal) through service systems visualization techniques.

Keywords: Service Design, Servitization, Industrial Product Service Systems, Service Logic.

Defining business model in a servitization scenario: A Spanish case study from a manufacturing company

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Abstract

Purpose: The paper aims to propose a comprehensive framework integrated by a model and tools that will facilitate the adaptation of traditional business models towards new service-based initiatives. This paper seeks to emphasise the relevance of collaborative networks for overcoming hierarchical manufacturing supply chains and the need of adapting current business models in the context of servitization and collaboration strategies.

Design/Methodology: The proposed framework integrates different approaches on servitization: the role of collaborative networks as a playground for service-based innovation and the servitization of products in manufacturing companies. Using a Spanish case study of a manufacturing company, from a European funded project (MSEE), this paper illustrates the implementation of such a framework where an explicit business model was developed for managing service-based innovation.

Findings: The framework discusses the identification of main dimenssions and elements of an ecosystem for a manufacturing servitization scenario, the governance of such ecosystem, its role in overcoming hierarchical manufacturing supply chains and the resulting innovation in their business models.

Practical implications: Whereas researchers can benefit from the development of a methodology that integrates different perspectives on servitization, practitioners can be encouraged to innovate in their business models when pursueing new service-based innovation and look at servitization from a collaboration-driven perspective.

Originality/Value: This paper contributes to knowledge with several concepts and models that help extending Service Science Management Engineering (SSME) concepts, which have been mostly devoted to support tertiary sector domains, to traditionally product-oriented companies and introducing the new concept of Manufacturing Service Ecosystems.

Keywords: servitization, manufacturing service ecosystems, collaboration, supply chain, new business models.

Índice

Enabler or inhibitor: Understanding the role of KPIs within the servitization process

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Abstract

Objetives: During the last decades, the telecommunications industry has witnessed important changes, due to both the emergence of technological opportunities and to significant regulatory decisions that led to deregulation and liberalization (Li & Whalley, 2002). The mobile telecom service industry is characterized by market saturation and demand heterogeneity forcing the companies to seek out new strategies (Corrocher & Lasio, 2013). The vendor landscape tried to react to those changes with mergers and acquisitions to complete their portfolio within a diversification strategy (Elfving & Urquhart, 2012). The competitive differentiators, e.g. portfolio, technology, quality and delivery range have further narrowed or even eroded (Elfving & Urquhart, 2013) and the relationship between vendors and operators is changing.

Taking into account the growing service dependence and the shifting roles of vendors and operators, a promising strategy lies in the path of servitization. Baines defined servitization as “the innovation of an organisations capabilities and processes to shift from selling products to selling integrated products and services that deliver value in use” (Baines, Lightfoot, Benedettini, & Kay, 2009). Within the last years, the understanding of servitization increased, different

phases within the development were distinguished and possible challenges and opportunities depicted (Vandermerwe & Rada, 1989; Oliva & Kallenberg, 2003; Gebauer & Friedli, 2005; Baines, Lightfoot, Peppard, Johnson, Tiwari, Shehab & Swink, 2009; Fundin, Witell & Gebauer, 2012). New guiding principles, structures and processes for production and support operations, which differ from traditional approaches, were elucidated as success factors for servitization (Oliva & Kallenberg, 2003). These are composed out of a mix of both service and production elements (Voss, 1992). However, as case studies show, product manufacture and service deliveries are largely decoupled within organizations (Baines et al., 2009).

One approach for the understanding of this detachment lies in the different organizational cultures of both product and service organizations. A product oriented culture leads to a specific mind-set and limits the ability of individuals what kind of change is needed (Nuutinen & Lappalainen, 2012). Gerry Johnson (1988) described organizational culture as a network of internal structures and processes, which continuously creates and enhances the self-perception of an organization. He introduced the concept of a cultural web, composed out of a number of elements that can be used to describe or influence organizational culture: Routine behaviors, organizational rituals, stories, organizational symbols, power structures, organizational structures and control and reward systems. The last aspect, control and reward systems, dictates what aspects of individuals and organizational performance and behavior are monitored and measured. Therefore, it shapes the perspective of individuals about what is important and desirable (Johnson, Scholes & Whittington, 2007). Moreover, it influences individual and group behavior to a considerable extent as long as they want to show desired behavior according to the rule system. A broader understanding of the impact of control and reward systems can be gained with the concept of organizational routines as “repetitive, recognizable patterns of interdependent actions, carried out by multiple actors” (Fledman & Pentland, 2003). KPIs as organizational routines can provide managers with a tool to support the change of a mind-set (Rerup & Feldman, 2011).

Therefor it is important to gain a better understanding about the effects of setting KPIs with respect to the behavior of organizational

members – whether they foster or hinder the servitization path. According to this background we are aiming at answering the research question: "What is the role of KPIs within the servitization path of an organization? When is it an enabling or limiting factor for the progression towards servitization?".

Methods: To answer the research question, a case study design (Yin, 1994) was chosen, integrating both qualitative and quantitative approaches. The study was conducted in the case company over 18 months during 2011-2013 and had a cross disciplinary approach, including behavioral sciences, operations research, organizational theory, and computer science. It started off with 20 semi-structured interviews with Line Managers (resource owners), Project Managers (customer project owners) and Global Resource Managers (resource coordinator) in services. From the interviews a number of emergent themes were extracted and used as basis for a survey aimed towards the same target group globally. In the survey a convenience sample from across the world of 478 resulted in 429 participants.

Results/Findings: While the case company's Service organization and Product organization utilized separate KPIs for their specific organization as dominant criteria in production and as dominant criteria in services. This did not appear to balance the organizational culture. The main paradigm was still that of a product provider. The challenges that occurred through this defining organizational culture were that the perceptions of contribution in terms of products vis-à-vis services had lagged behind actual historical changes in the make-up of the organization.

As a result a mind-set where products are pitted against services has been allowed to occur, effectively slowing down or hindering progression towards a perceived common goal and re-enforcing the self-referencing mechanism as a product company.

The goal of progressing on the servitization path to an integrated product and service provider was impeded.

Implications/Conclusions: KPIs play a very important role for organizations on the servitization path. It is necessary to generate common goals in general and KPIs in particular to moderate the self-referencing mechanism.

Keywords: Servitization, Performance Management, Key Performance Indicators (KPI), Organizational culture.

Índice

Tracing a service business logic in manufacturing firms

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Abstract

Intoduction: During the last decade, the theoretical perspective on service as a new marketing logic (Vargo & Lusch, 2004; Grönroos, 2006) has gained momentum. Diverging from the traditional goods logic, which viewed services as a category of market offerings, the new marketing logic views service as a value creation perspective (Edvardsson et al., 2005). Scholars have further argued that service logic is not only a perspective of marketing, but also potentially pertains to manufacturing firms with long production traditions (Grönroos, 2008; Grönroos & Helle, 2010; Vargo & Lusch, 2008; Ulaga & Loveland, 2013). In this sense, service logic is a business logic, that is, a provider perspective on value creation (Grönroos, 2008).

Although service business logic has been advocated for manufacturing firms, how it could be applied is only generally described (e.g. Grönroos & Helle, 2010; Karpen et al., 2012) and empirical research is sparse. The purpose of this paper is to describe how service business logic could be applied in a manufacturing firm, by studying service actions on the cultural, strategic, and tactical marketing level. The results of the service actions (and the co-creation of value with the customer) in terms of value created for the firm will also be discussed.

Theoretical Framework/Method: According to service business logic research, value is created in use (e.g. Normann & Ramírez, 1993; Ravald & Grönroos, 1996; Wikström, 1996; Vargo & Lusch, 2004;

Grönroos, 2006; Grönroos, 2008). This implies that the customer is always the value creator and the service provider can either facilitate the customer's value creation by offering resources, or co-create value by getting involved in the customer's process. Through firm-customer interactions, mutual value creation might take place (Payne et al., 2008; Grönroos, 2008; Grönroos, 2011); however, this is not always achieved. Previous research has shown that service offerings do not automatically augment the manufacturer's sales and revenues (Fang et al., 2008) or the firm's profit (Eggert et al., 2011).

Empirically the paper builds on a qualitative case study of a manufacturing firm in the pulp and paper industry that has managed to create a profitable and continuously growing service division. Twelve semi-structured interviews were conducted within the firm's service division with employees at various positions, such as general manager, sales manager, product manager, salesman and service staff member.

Findings: In the studied firm, several service actions were identified that could be summarized as six dimensions of service business logic. The applied dimensions could all be related to service business logic in terms of supporting the customers' value-creating processes and value generation for the firm itself. The identified applied dimensions of service business logic were: *a common understanding of service, close customer relationships, effective customer dialogue, a proactive mindset, an acknowledgement of service, and continuous service development.*

The six applied dimensions of service business logic that were identified all contribute to a service-oriented mindset on the cultural marketing level that is reflected strategically and tactically (Webster, 1992). The dimensions also relate to three conceptual dimensions identified in the service business logic literature, that is, knowing the customers' activities and processes, creating platforms for direct firm-customer interactions, and focusing on knowledge and skills (e.g. Vargo & Lusch, 2008; Grönroos & Gummerus, 2014). Moreover, their implementation generated value for the studied firm in three different ways: new business knowledge, additional sales, and profit from service.

Conclusions/Managerial Implications: A common understanding of service could be seen as fundamental to the other applied dimensions of service business logic. The view that service is when a customer problem is solved was reflected on all marketing levels of the firm and was considered a prerequisite to succeed with services. Practically, this could also be done by creating platforms for interactions, such as regular meetings and continuous marketing of service by all employees. Moreover, the acknowledgment of service proved important to create a service-oriented mindset of employees. It seems to be facilitated through separation, both regarding a separate service division and a separation of the product and the service offering. In the long run, this could be argued to be according to a goods business logic; however, it proved effective in acknowledging services and in achieving mutual value creation.

On the other hand, the value co-creation perspective that this view implies, has led to challenges as customers applied goods business logic. According to Grönroos (2008), customers that view services as resources will not be receptive to a service business logic. The manufacturing firm needs to adapt its offering to the customer's view on value creation. This study shows that only the tactical level needed to adapt to the customer's goods business logic, which was done, for example, through providing a physical outcome of a service, such as a report. By basically applying a service business logic and then adapting its tactical service actions to the business logic of its customer, the firm managed to generate value from the service.

This study addresses the knowledge gap regarding practical service business logic and it contributes to the research fields of service logic and services in manufacturing. By studying service logic from the perspective of a manufacturing firm, the research on service logic as a business logic is developed. By taking the perspective of the supplier and its own value generation as part of a service business logic, a perspective not much discussed in service logic is addressed. This is an important perspective, since many manufacturing firms struggle to get their service businesses profitable. The study shows that the applied dimensions of a service business logic led to value for the firm in terms of new business knowledge, additional sales, and profit on the service. Therefore, it

could be argued that applying service business logic among service employees in a manufacturing firm could be beneficial, since it enhances value generation opportunities also for the firm itself.

Keywords: Service business logic, value co-creation, mutual value creation, empirical research.

Índice

The servitization process: A proposal for changes to operations decisions and the business model

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Abstract

Objetives: El Servitization can be understood as the process used to increase value by adding services to products (Vandermerwe & Rada, 1988). It is a means to create value- added capacities that are distinctive and sustainable in the face of competition (Baines, et al., 2009b). Authors such as Neely, (2008) consider that the servitization process can be viewed as the development of an organisation's development capacities, in the sense of rather than offering only products, the organisation also offers product-service systems (Visnjic & Van Looy, 2013).

In times of crisis, such as that which is currently being experienced, the value chain of manufacturers' goods is becoming less attractive in so far as the demand for products has stagnated. In this scenario, companies are aware that their value lies in providing the services needed to allow the products that they manufacture to function and be maintained Wise & Baumgartner (1999). Davies et al. (2007) point out that services provide a continuous income, higher benefit margins and require fewer assets than manufacturing.

When successfully carrying out the servitization process, the company needs to redesign its business model. It is desirable for companies to change their service orientation, but this is not without its difficulties as it is also necessary for them to transform their business models.

Despite the fact that services are gaining importance in the industrial sector, the literature review carried out during the course of this work has shown that few studies offer guidelines and techniques with which to integrate goods and services into organisations (Baines et al., 2009a), or business models to facilitate the change from product orientation to service orientation. The functional area most directly implied at the heart of the organisation is the change in operations. With regard to the servitization process, it is necessary to ask the following questions: i) what changes must a company confront within the sphere of operations?; ii) which business models are most appropriate? and iii) which business architecture structures will facilitate this?.

The objective of our work is therefore to analyse the servitization process as presented in literature in order to develop a proposal for the installation of this process in a company for the purpose of operations decisions, and to develop a business model that will be characteristic of servitizized companies or of those which opt for 'servitization'.

Implications/Conclusions: The work presented herein therefore provides guidelines for companies that decide to transform their value chain by exploiting those of their business activities that have a high added value. From the theoretical point of view, this work contributes towards increasing the research in this area with a proposal for the changes that should be made to the principal Operations decisions in order to favour the servitization process. From the practical point of view, these decisions are integrated into the proposal in order to provide those companies that decide to adopt a servitization process with an innovative business model.

The paper is structured as follows. First, a literature review is carried out as regards servitization, decisions in the operations area and business models. We then go on to describe the servitization process from a theoretical standpoint. We next propose the structure for a business model that will favour the servitization process. Finally, we present our conclusions and the principal contributions of this work.

Keywords: Servitization, Operations Decisions, Business Models.

Índice

Managing global operations: Lead plant role as service provider

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Abstract

In the current global economy, with an increased international presence of all type of organisations, the design and management of global operations networks (GON) plays a vital role in organisational competitiveness. Whilst all type of organisations are facing significant challenges for managing increasingly complex global operations, current literature on global operations networks is still limited in its scope.

As a result of the internationalisation trend and in order to take the opportunities that exist in markets worldwide, companies of all types have now a global presence (Veerecke, 2007). This has created a new set of organisational challenges that require attention and answers from the academic community. As a consequence of the economic globalisation the design of global operations networks (GON) will increasingly need to cover multiple regions and cope with higher network complexity (Shi & Gregory, 1998; Ernest & Kim, 2002), connecting markets to global supply and manufacturing sources beyond any geographical border. However, the literature on global operations network design and management is still scarce and fragmented (Corti et al., 2009; Laiho & Blomqvist, 2010). Existing research highlights several limitations in knowledge including the need for a better understanding on the evolution and

coordination of the operations of individual production units within a network of manufacturing facilities (DuBois et al., 1993; Shi & Gregory, 1998; Shi & Gregory, 2005, Cheng et al., 2011) and the lack of models and techniques to aid practitioners formulating and developing operations strategy when designing or restructuring a GON (Vereecke & Van Dierdonck, 2002; Meijboom & Vos, 2004), which results in difficulties to renew competences and capabilities of individual facilities (Teece et al., 1997; Sweeney et al., 2007).

An interesting proposal was presented by Ferdows (1997a), who stated that the management of GON could be carried out based on the strategic plant role concept. Ferdows's work has been subsequently tested and further developed in an attempt to deploy the strategic plant role concept as a means to design and manage GON (Verecke & Van Dierdonck, 2002; Meijboom & Voordijk, 2003; Meijboom & Vos, 2003; Maritan et al., 2004; Feldmann et al., 2009; Feldmann, 2011; Cheng et al., 2011). However, there is still no evidence of its practical implementation within a GON (Mediavilla & Errasti, 2010) and, as a result, any attempt to design and/or restructure a GON is difficult to put into practice since the plant role concept is complex to formulate, deploy and prioritise (Meijboom & Vos, 2004). This is paradoxical as the higher the role the lower the chance for a plant to disappear from the GON (Vereecke et al., 2006). With the current degree of globalisation inefficient plants can no longer survive even in distant local markets (Mefford & Bruun, 1998).

Parallel to the internationalization phenomenon, more and more companies are bundling services with products and engaging in life-long product support to maximize consumer intimacy and access higher margin activities. This leads to more customization and complexity in supply chains, which in turn demands new manufacturing capabilities together with responsive supply models.

A growing number of products, in fact, are becoming commodities, while customers seek solutions rather than simple products Durable goods industries are experiencing a trend toward the same integration of product and service that manufacturing companies offer, defined as product-centric servitization (Vandermerwe & Rada, 1988; Baines et al., 2009a; Baines et al., 2009b). Thus, some

manufacturing companies are shifting their value proposition from the “sale of product” to the “sale of use” (Baines et al., 2007) in order to generate profits, growth, and increased market share.

The extended paper will present the application of Ferdows’s model for the analysis of strategic plant roles in a GON and extends the scope of this model by discussing a framework for deploying an improvement roadmap, which facilitates the strengthening of capabilities of individual plants and a gradual upgrade of their strategic role within a GON. Specifically these competences linked to service functions oriented externally (towards markets and customers) or internally (within the network) that the richest strategic plants roles (e.g. lead plants) should master will be presented.

The extended paper will firstly discuss the literature on international operations management, so as on manufacturing servitization, and will identify the current gaps in research. It then will present the methodological approach adopted to carry out the research before moving into providing a detailed description of the construct developed by the research team. The evaluation of the construct will be discussed using an action research study within a multinational white goods company. The extended paper concludes by highlighting the contribution of the research, its limitations and future research opportunities.

Keywords: Global Operations, Network, Plant role, lead.

Índice

Assessing the explanatory power of KIBS for the international competitiveness of industrial sectors

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Abstract

Various scholars from diverse research angles report about the virtues of KIBS for industrial competitiveness.

Several innovation studies demonstrate that KIBS are beneficial for firms' innovation capacity as they form both a supplement to internal R&D structures as well as external Science and Technology-based support structures (typically governed by public ownership). Similarly, global value chain studies argue that sectors that are heavy consumers of KIBS tend to occupy sweet spots in (cross-border) value chains. More from an economic geography standpoint: whether such services are sourced locally or are imported, influences in the eventual footlooseness of the sectors that consume KIBS. As such, KIBS form a relevant element in regional innovation systems: they contribute to retaining and (re)vitalizing specific segments in global value chain, and due to their superior closeness to SMEs they tend to be instrumental to a larger share of SMEs' innovation capacity than public research are. Finally, from the perspective of smart specialization, KIBS arguably function as (quasi) KET and pivots for industrial development, as they spur and diffuse know-how and information across sectors.

In line with the former it can be argued that if KIBS consumption is good for a sector's competitiveness, there should be a correlation between intensity of KIBS uptake and sectoral competitiveness in

the international realm. Meaning that KIBS consumption ought to be higher in those sectors where a territory occupies a relatively high share in world trade.

To test for correlation between «use of KIBS» and «(international) competitiveness», we make use of input-output tables from the Basque Country 2000-2015 and regional accounts regarding turnover and export per sector. Focus is placed on consumption of the following KIBS: ICT services, R&D services, architectural and engineering services, and marketing and publicity.

We find a strong fit between consumption of KIBS and international competitiveness parameters for the industrial manufacturing sectors screened.

Consequently, we postulate that the use of KIBS is beneficial for consuming industries. To have a sound KIBS basis in a territory contributes to having a healthy knowledge supply side in place and to serve knowledge needs of the industrial demand side. KIBS can thus contribute to avoid industrial footlooseness situations. At the same time, we assume that reverse causalities may be at play (international competitiveness boosting (local) KIBS consumption) and that laws of diminishing marginal utility apply, meaning that saturation of consumption may occur and that "more KIBS consumption" leads to "decreasing returns" from a certain point onwards.

Keywords: KIBS, industrial competitiveness, input-output analysis, buyer-supplier relations.

Índice

Relationship marketing in knowledge intensive business services: A relationship marketing model in B2B markets

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Abstract

Objectives: The purpose of this paper is to report the state of the art of the main theorists on relationship marketing, services and apply these areas to KIBS. Currently we live in the era of services, which has been presented theoretically by the logic that all organizations, markets and society are involved in the exchange of services (Vargo & Lusch, 2004). By this logic, marketing should pay much more attention to principles, theories and practices of services. This paper analyzes first, the main theories and concepts of services, the tools related to the management of services marketing and the servitization concept (Vandermerwe & Rada, 1988). If companies consider servitization and advanced business services as their main value offer, they should have an orientation towards relationship in order to know the needs of their clients. This knowledge of the need of the clients would help generating value and building long term relationship with them. So we also analyze the relationship marketing concept (Gummersson, 2005). Finally, we analyze the importance of Knowledge-intensive Business Services, and more precisely, KIBS in the B2B market.

Servitization is recognized as the process of creating value by adding services to products (Vandermerwe & Rada, 1988). There is a

growing interest in this topic by academia, business and government because there is a belief that a move towards servitization could create additional value for manufacturers (Hewitt, 2002; Muller & Doloreaux, 2007; Baines et al., 2008; Smith et al. 2014).

According to Nordin and Servadio (2012) scholars have studied servitization from different points of view during the last decades. One research stream is an internal perspective in the analysis to understand the servitization from the company's inside (Galbraith, 2002; Oliva & Kallenberg, 2003). A second stream is how service offering is carried out by manufacturers. The main point is still internal, in the sense that the purpose is to identify organizational competences and capabilities that have to be practiced in order to deliver services, but in addition, it links the internal activities with the external factors involved in the process of servitization (Davies et al., 2007; Shepherd & Ahmed, 2000; Gebauer et al., 2007; Spring & Araujo, 2009).

The third research stream it is defined as relational dimension of servitization (Hakansson & Snehota, 1989). The focus of the analysis is on the external activities and on understanding how and why manufacturers interact with different networks when delivering services and solutions. Nordin and Servadio (2012) have grouped the articles within this research stream into two subgroups: 1) the first category is based on supplier-focused articles; 2) the second category is composed by primarily customer-focuses articles. The latter is closely related to the idea that customers are considered as active actors that could co-create value in the servitization process (Vargo & Lusch, 2004, 2006; Grönroos, 2008).

Since the mid 1990s, there has been a significant increase in the attention paid to KIBS. However, in comparison to the manufacturing sectors, KIBS remain poorly studied by analysts of innovation and technological change, and their future development has rarely been considered in terms of policies and roles in their respective innovation and productive systems (Muller & Doloreux, 2007).

Only a limited number of papers have focused on the servitization process and the link to relationship marketing in Knowledge-intensive Business Services (KIBS) in B2B markets. In our paper we focus on this gap. The aim of our research is to relate relationship

marketing and services marketing in the context of KIBS providers and their clients in B2B markets in order to identify what are the antecedents to propose a model.

Methods: The methodology used in this article is classified as bibliographic through the review of the state of the art, present in books and articles. Our investigation consists of an extensive analysis of relationship marketing, services and KIBS literature in B2B markets.

Findings: The findings of this paper are that we establish the possible connections between the main subjects of study, services, relationship marketing and KIBS in B2B markets, as part of strategic management of organizations. Then we propose several propositions that could be part of a model that could be contrasted in further empirical research.

Implications: There are some important implications at different levels. At the managerial level, it could be a previous to analyze the implementation of relationship marketing business models in KIBS in B2B markets, taken into account customer expectations and perceptions. At the micro-economic level the identification of the antecedents of relationship marketing in KIBS in B2B markets could help companies to improve their competitiveness developing appropriate models. At the macro-economic level it could help policy makers deciding about policies in different territories and types of services.

Keywords: Services marketing, service-dominant logic, relational marketing, servitization, KIBS.

Índice

Price to win through value modelling for service offering

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Abstract

Purpose: To present an approach to determine the price companies should bid to win a contract to deliver product service systems, and make a profit.

Design/Methodology/Approach: Industrial case studies are used as the test bed. A combination of subjective probability and value modelling have been used in this research.

Findings: Current approaches to determine the price to win for a product oriented service contract have mainly focussed on the cost of the physical asset and its' specification. There is little research, where the 'value' the tangible and intangible aspects of a product service system to the customer is considered. The proposed approach provides the decision-maker with information on the value of their/and their competitors offering, therefore assists in selecting the price to bid for the service contract.

Practical implications: Our approach can be used by industry to model the key value drivers for their customers and provide information on the probability of winning and probability of making a profit. This research provides a step-by-step approach for

identifying uncertainties eliciting the value of the service being offered to the customer and modelling these to estimate the probability of winning.

Social Implications: This research provides practical guidance to decision makers and bid teams.,

Originality/Value: Highlights how the tangible and intangible aspects of a Product Service System can be quantified in monetary terms to assist in decision-making.

Keywords: Product Service Systems, Price to Win, Value Modelling, Subjective Probability, expert elicitation.

Índice

Smart healthcare services: A patient oriented cloud computing solution

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Abstract

Objetives: Unparalleled technological advances in information technologies and telecommunications, such as cloud computing, wireless networks, mobile computers and smart sensors are leading a new type of information infrastructure with potential to effectively support healthcare services. Nowadays, medical assistance like tracking the progress of a patient's health condition is not limited to be done inside a hospital, due to enhanced and cost effective modern technologies that permit patients to monitor their health records by themselves. At present, a patient can update, monitor, check and save its daily health status from anyplace. Patients data and records are not written in paper sheets and kept in shelves, but stored and saved into the cloud facilitating 24/7 remote access to physicians, patients, nurses, relatives and stakeholders. These smart health monitoring devices are quite effective and user friendly; they monitor the health status of a patient automatically almost without human interference, reducing the chances of human error by limiting the care staff role. These device capabilities enable remote diagnostic services, help patients to be more aware of their health conditions and advise them to take corrective actions before falling into more complications.

Methods: This study proposes a proof-of-concept design for a Cloud infrastructure that enhances patient oriented healthcare solutions.

Results/Findings: This Cloud-based healthcare infrastructure attempts to be doubly effective, from one side technically effective; monitoring, updating and storing information into the cloud, making it accessible whenever is needed, and from the other side economically effective; minimizing time wastes and manpower necessities.

Implications/Conclusions: This research provides a new and disruptive innovation in Healthcare sector; presenting a practical patient oriented cloud-based infrastructure, a new path in healthcare services.

Keywords: Servitization, Healthcare Management, Cloud Computing, Telemedicine, smart sensors.

Índice

A case study of servitization in the farming livestock sector: Organizational change and potential environmental improvement

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Abstract

Objetives: This paper explores the scope of servitization practices in the farming livestock sector in Galicia and tries to determine the contribution of providing joint services to improve the environmental performance of farming activities. Therefore, the objective of the paper is twofold: firstly, we propose a conceptual framework to clarify how servitization practices are present in mature sectors such as farming and what type of organizational change they involve; secondly, we try to shed light on the contribution of servitization to diminishing the environmental impact of economic activities.

Methods: The paper is based on a broad literature review and desk research in order to identify the generic elements of servicizing and their manifestation in the farming sector. In particular, this work is based on the European research project Servicizing Policies for Resources Efficient Economy (SPREE), which focuses on the potential of servicizing to diminish the environmental impacts of economic activities. Then, a case study of three Galician cooperatives offering farm machinery, heifer breeding and feeding services is carried out in order to illustrate the conceptual framework.

Additionally, the corporate carbon footprint (CF) according to the Compound Method Based on Financial Accounts (MC3) method is

used to assess the changes in the carbon footprint of the studied cooperatives. The MC3 (Doménech, 2007; Carballo Penela & Doménech, 2010) is a hybrid method to estimate the CF of companies and products based on the cradle-to-gate life cycle. In this sense, we compare the CF of the three livestock farms before and after joining to the cooperatives. The data is collected through a deep interview maintained with the cooperatives' manager and through ledger accounts.

Results/Findings: Servizicing, also called servitization, refers to a shift in the focus of a company from selling products to satisfying the customer needs with the support of a hybrid of products and services. In the last recent years servicizing has also been defined in the engineering and management literature as a business strategy towards dematerialization, therefore, as a strategy able to combine profitability and environmental protection objectives (Mont, 2000).

It is suggested that customers can benefit from contracting services instead of purchasing products because they avoid a high initial expenditure in acquiring fixed assets, they gain flexibility in the use of the assets and they can also obtain a more customized result. Service providers can also get some advantages: from resource efficiency due to the intensive use of assets to knowledge advantages due to the close relationship with customers (Baines et al., 2007; Beuren, Gomes Ferreira, & Cauchick Miguel, 2013). Moreover, it is expected that based on servicizing models, companies find more incentives to adopt eco-innovative solutions.

Farming cooperatives represent a way of servicing certain activities to individual farms. Farm machinery cooperatives have existed for long in some European countries. However, other forms of sharing services, such as those regarding heifer breeding and livestock feeding have been more recently developed, in answer to competitive pressures emerged in a more liberalized agricultural sector. From our point of view, cooperatives represent a good example of servitization in this mature sector.

Based on the SPREE definition of servicizing and building upon the examples found in the agri-food sector, we identify the generic elements of servicizing:

- Product-service: servicizing involves a combination of products and services;
- Enabling platform: servicizing implies different possibilities of product use (from owning to sharing and to providing a final result) and this requires different networks of actors;
- Functional result: the customer need is satisfied with the function of the product rather than the product itself.

Overall, cooperatives are a way of sharing equipment and tools, as well as facilities. Apart from opportunities to take advantage of economies of scale, these associations between farmers can offer several services and contribute to the overall sustainability of their members and communities. Although there is not an inherent relation between servicizing and a better environmental performance, the CF analysis shows that servitization practices could help the analyzed cooperatives to achieve a lower footprint.

Implications/Conclusions: This paper offers two main contributions: firstly, a conceptual framework to understand servitization practices in the farming sector is developed. This result is relevant for farmers and policy makers interested in contributing to the improvement of farming efficiency, especially in the context of highly competitive agricultures; secondly, we enrich the literature on servitization with an empirical case study of the environmental impact of those practices, based on a proved methodology such as the MC3 method and a valid indicator, the carbon footprint. This result is also relevant for policy makers who are interested in diminishing the environmental impacts linked to farming activities.

Keywords: Servicizing, cooperatives, farming sector, carbon footprint.

Índice

The strategy map of servitization: Learning from previous research and ongoing implementation experiences

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Abstract

Objetives: While seeking for higher returns, manufacturers have been moving from stand-alone products to integrated solutions (Matthyssens and Vandenbempt 2008; Sawhney 2006). The servitization process (Vandermerwe & Rada, 1988) is typically far from simple (Auguste et al. , 2006; Kindström & Kowalkowski, 2009) as companies need to develop or acquire new resources and competences (Brady et al., 2005; Ceci & Masini, 2011; Paiola, Saccani, Perona, & Gebauer, 2013) while adjusting the organizational structure (Davies, et al., 2006; Galbraith, 2002; Oliva & Kallenberg, 2003), altering behavioural aspects in the organizational culture (Gebauer & Friedli, 2005), and changing their mind-set (Galbraith, 2002). Establishing both relationship marketing and relational interactions has been also highlighted by multiple studies (Kohtamäki, Partanen, Parida, & Wincent, 2013; Tuli, Kohli, & Bharadwaj, 2007).

Consequently, while moving from offering stand-alone products towards offering services companies must design and implement strategic initiatives to redefine their processes and routines to realign human resources, IT and R&D to the demands of their customers (Kaplan & Norton, 2006), which in turn will also have an effect on the resource base and the organizational identity (Jacobides & Winter, 2005). Even more, because the strategic

convergence gradually reduces the differentiating power of the servitization strategy over time (Mathieu, 2001), the specific activities and practices designed by companies for implementing the strategy, rather than the strategy itself, emerge as the real sources of competitive advantage (Kaplan & Norton, 2006).

Despite the existence of a large number of studies, we are lacking the knowledge on how manufacturers implement a servitization strategy. To advance this understanding, our study uses the strategy map framework (Kaplan & Norton, 2000). The map includes four strategic levels: the financial perspective, the customer perspective, the internal process perspective, and the learning and growth perspective and focuses on the strategic logic leading to the firm success. As suggested by Porter (1996), the competitive advantage is rooted in a particular activity system of discrete but interconnected activities supported by a set of dynamic resources and capabilities (Porter, 1991) and driven by different structural determinants of cost or buyer value (e.g. scale, accumulative learning, linkages between activities, the capacity utilization, the level of vertical integration, etc.). Therefore, at the bottom of the pyramid, different specific strategic initiatives reflecting managerial innovation (Gebauer, 2011) and choices must be implement to conFigure and take advantage of these structural drivers. Thus, whereas the discrete activity becomes “the basic unit of competitive advantage”, “a firm’s strategy defines its configuration of activities and how they interrelate” (Porter, 1991: 102), which is the ultimate origin of the competitive advantage (Porter, 1996).

Companies moving from offering products toward services are a case in point. Although many authors have noticed the importance of such micro-level approach (Gebauer, 2011; Storbacka, Windahl, Nenonen, & Salonen, 2013; Storbacka, 2011), this perspective is not always explicitly included as an analytical dimension in the analysis of the sources of competitive advantage of the advanced industrial service offerings. This study aims to fill the identified gap by giving a detailed overview of what the servitization business logic means in terms of the required changes in micro-level strategic initiatives, practices and processes (Baines & Lightfoot, 2014; Storbacka, 2011). We aim to identify what type of micro-level strategic initiatives do

companies implement to create sustainable competitive advantage when moving from product- to service-based business logics?

Methods: Our study is built on an abductive process where theory, fieldwork and empirical data co-evolve (Dubois & Gadde, 2002). After an in-depth literature review, the first empirical part of our research draws on evidence collected from an on-going research project covering a five-year period (2011–2015) that involves a total of 19 manufacturing companies headquartered in Finland from metal and machinery industry. These companies offer comprehensive industrial solutions for their customers, which include industrial services. We selected the informants for this study based on their personal working-life experiences with manufacturing and industrial services, their development and/or implementation in the supplier/customer – relationships in these companies. Altogether, the project comprised 36 in-depth interviews. Based on these results we designed the questionnaire to study five cases in depth. Thus, our research maps the servitization strategy based on a multiple-case study (Eisenhardt & Graebner, 2007; Eisenhardt, 1989). We used a straightforward "purposeful" sampling as selection method. The chosen companies represent some of the biggest players in their representative markets and have been implementing active servitization strategies while continuously redesigning their service offering. Therefore, they are proper cases for illustrating the notion under consideration and clear opportunities for uncommon research access (Eisenhardt & Graebner, 2007; Yin, 1994).

Results/Findings: The implementation of the servitization strategy consists of various interconnected micro-practices both inside the manufacturing company and wider in the customer collaboration and company's network. We classify the identified practices (over 50) based on the four levels suggested by the strategic map. Thus, our study illustrates and discusses how these practices can be integrated to achieve better performance. We show how the successful implementation of servitization strategy is a multi-dimensional and multi-authored (Buchanan & Dawson, 2007) process being 'multi-faceted with separate individual logics at play' (Salonen, 2011: 689).

Implications/Conclusions: Based on an in-depth literature review, we contribute by illustrating the servitization strategy of five large corporations while mapping it by using the strategy map (Kaplan & Norton, 2000). Our study is the first to develop the concept for 'servitization strategy map'. From a practical standpoint, this study brings knowledge for the managers and other key players within various functions (operations management, sales, marketing, product development, service personnel) of successful implementation practices for further development. Therefore our study also helps the companies in the initial phase of the servitization to analyse, benchmark, and develop their firms' servitization strategy to facilitate long-term value creation and appropriation.

Keywords: Strategy Map, Servitization, Industrial Services, Business Models.

Índice

Towards a knowledge-based view on service innovation: The case of retrofit business

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Abstract

Purpose: In this study, we investigate how knowledge-intensive services create value in the context of product-focused businesses. The aim of this paper is twofold: first to depict the retrofit case study as a knowledge-intensive (skill-based) service and second, to create and formally describe models for skill-based services in manufacturing firms and their interactions with scale-based services.

Design/Methodology/Approach: The research design of this study follows an inductive case study approach on skill-based services and scale-based services in a European manufacturing giant context. Given the nature of our research question, a qualitative approach offers deeper insights and richer data.

Findings: Based on findings from the studied case firm, we propose, formalize and describe skill-based services that (1) brings proactivity to the service business (2) strengthens the firm reputation and establishes long-term relationships with customers (3) interacts with other services hence paving the way for spill-over businesses.

Implications: Managers who turn their attention to services in product-focused businesses, should not be caught blinded by the quick-wins of scale-based service business but also provide resources and attention to the skill-based services, as the interplay and synergies between these different service businesses could be critical to the firms.

Keywords: knowledge-based view, skill-based services, strategy, manufacturing.

Índice

Customer value perceptions and business models: The case of O&M services in Swedish wind energy industry

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Abstract

The general product-dominant industry logic of the 20th century's logic is gradually getting substituted by service-dominant logic (Maglio & Spohrer, 2013; Chesbrough, 2010). According to Maglio and Spohrer (2013), such service science approach signifies that any economic activity is based on exchange of services between entities, while products are just transmission vehicles for applying human competence.

Many capital-intensive industries such as airplane and shipbuilding industries have already experienced such transition, and companies in these industries have learnt how to use their distinct and qualitative after-sales and maintenance services to differentiate themselves (Cohen & Whang, 1997). In quite some cases of durable goods manufacturers, after-sales service and sales of spare parts exceed the margins of the product itself (Cohen & Whang, 1997; Kuo & Wang, 2012). For instance, the airplane industry has developed an effective and economically sustainable way of organizing maintenance to prolong the lifetime of an airplane through such activities as setting up a list of obligatory maintenance, using high safety

margins when designing an airplane, developing modular systems and diagnosing systems for every flight (Dekker & Scarf, 1998).

However, many researchers emphasize that it is a rather challenging process for manufacturing companies to servitize. Visnjic and Van Looy's (2013) notice that it is difficult for manufacturing companies (which in their essence thrive for efficiency) to adapt to service logic. Oliva and Kallenberg (2003) discuss that manufacturing companies may underestimate service potential of their product.

A good illustration of servitization challanges is the rapidly growing wind energy industry in general and particularly in Sweden. While the industry is growing rapidly problems occur with ensuring high quality of O&M (operation and maintenance) services, which has negative consequences for wind turbine customers (Duncker, Klötzer & Larsson, 2010). According to Vindstat (2014), the availability of wind turbines in Sweden has been steadily decreasing from 99% in 2006 down to 95% in 2013, which means that O&M is not managed well. Such difficulties with O&M put the whole industry in quite a challenging position and may undermine profitability, especially when electricity prices are going low in Sweden. This growing problem can be related to the manufacturer's focus. Lema et al. (2011) point out, during the rapid growth of the industry wind turbine producers have been focusing more on manufacturing and installation phases of wind power projects, i.e. producing, selling and delivering new units, as the main point for business growth. Similar idea is expressed by Bertling Tjärnberg and Wennerhag (2012) who say that the wind energy industry has been focusing on implementing and building farms rather than focusing on providing complete product and service solutions.

In the current conditions in wind energy industry, business model innovation in O&M services is needed. While initial step in business model innovation is identifying what is valuable for customer (e.g. Johnson et al., 2008; Johnson, 2010; Teece, 2010; Chesbrough, 2010; Osterwalder & Pigneur, 2010; Frankenberger et al., 2013), it is not clear what is of customer value in industrial markets context (Keränen & Jalkala, 2013), how to identify it and what is valuable for industrial customer in O&M overall and in wind energy industry in particular. Thus, the purpose of this paper is twofold. First, we aim

to explore how and why customer value perceptions differ in the industrial context of wind energy industry in Sweden. Second, we aim to explore what implications customer value perceptions in industrial context have for the process of business model innovation.

An inductive based approach was employed in this paper. We have used multiple case study approach studying four cases of O&M services customers in wind energy industry in Sweden. Semi structured interviews were conducted with representatives from each company. The parts of their business models connected to wind turbine O&M were mapped, as well as their customer value perceptions were outlined. The connection between customer value and business model components was analyzed within each case and then the results were compared across the cases.

Our results show that industrial customers' business models serve as cognitive filters in managers' decision making process. Customer value formation process, part of which is an assessment of what the customer will perceive as pains and gains, benefits and sacrifices, is also of a cognitive nature. Thus, customer's business model, and more specifically its components (e.g. key activities, key resources), and the intentions for their development form specific underlying criteria in value formation process /value proposition assessment which determine perceptions of customer value.

The specific underlying criteria in value proposition assessment in O&M in wind energy industry in Sweden, found in this study, are existing competence, characteristics of the fleet, involvement in O&M activities, and the intentions for further development of O&M involvement. Those are consistent with previous research in the field of industrial marketing on customer value which brings up criteria such as customer characteristics, frame of references, specific use situation, values and goals. Our findings show that such specific underlying criteria can be successfully derived by systematically mapping and analyzing the different elements of a customer's business model. Therefore, this research answers the call of Keränen and Jalkala (2013) for finding holistic framework for understanding customers' value formation process in industrial context.

Differences in customer value among O&M customers in wind energy industry in Sweden were identified in their perceptions of customer value of O&M service and relationship with service providers. Such value drivers as alternative solutions, responsiveness, price, flexibility, technical competence, trust, product customization (Lapierre, 2000) were identified in connection to different parts of O&M value proposition (contracts, SCADA system, reports, and education). The importance and value created by each value driver is customer specific. Customer value of relationship differs in what kind of relationship the customers of O&M services want to have. These different preferences can be aligned with the relationship spectrum including transactional, value adding and collaborative relationships (Day, 2000). Even though the differences in perceived customer value were identified, it is important to emphasize that the core customer value is to get the highest possible energy production of wind turbine.

The implications of this study are specific for managers in wind energy industry in Sweden but can also be used as more general inspiration for managers that work with business model innovation. First, service providers can use their customers' business models to systematically map, analyze and identify customer value which in turn can be used to segment the market based on the customers' characteristics of the fleet, existing competence, involvement in O&M and intentions for further development of involvement in O&M. This way of identification of customer segments and adapting the business model accordingly could lead to higher perceived customer value by each target segment.

Second, service providers can create more dynamic contracts which allow the contract content to change over time as the customer gets more knowledge, the wind turbines get older and their condition changes.

Third, service providers must recognize that some of their customers have extensive service and maintenance knowledge from other industries and seek more collaborative relationship rather than purely transactional. Thus, service providers shall be prepared to involve those customers when innovating their business model (e.g. formulating value proposition, partner channels, partner

relationships). Finally, service providers shall consider working with a portfolio of business models suited to the perceived customer value as derived by the industrial customer's business model for each target customer group in order to reach higher customer satisfaction.

Keywords: customer value perception, business model, wind energy, operation and maintenance.

Índice

Contemporary operations strategies of UK container ports in the era of servitization: A conceptual framework

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Abstract

Purpose: This paper aims to create the initial interconnection between two distinct literature streams in order to propose a conceptual framework that investigates the effects of Port Centric Logistics (PCL), a contemporary strategy followed by UK container ports, on their operations strategy.

In a challenging business environment, organisations have tried to manage revenues whilst sustaining relationships with increasingly sophisticated customers (Gebauer et al. 2008) and overcoming saturation barriers in core product markets (Sawhney et al. 2004). As a response an increased provision of value added services (VAS) in order to enhance the core product offerings of organisations has been noticed (Gebauer et al. 2006). Vandermerwe and Rada (1988) defined this phenomenon as "servitisation".

The adoption of a servitisation strategy affects organisations in multiple ways. Particularly, the successful implementation of servitisation requires changing strategy, operations, value chains, technologies, and employees supporting cultural shifts in the organisational blueprint, and system integration capabilities (Gebauer et al. 2006, Zahir et al. 2013). To transition towards increased service provision firms need to build the appropriate

organisational capabilities and culture, as critical for the successful implementation of a servitisation strategy (Neely et al. 2011).

From a literature review on servitisation four distinct groups of drivers relevant to the transition of manufacturers to service providers were identified. These drivers are involved with financial, strategic, marketing (Baines et al. 2009) and environmental implications (Zahir et al. 2013). It should be mentioned that the literature on servitisation focuses on manufacturers. Thus, a research gap on services providers which enhance their offerings with the provision of VAS exists. An example of such organisations is the port sector.

Increasing economic globalisation, and subsequent reshaping of markets determines the contemporary business environment of ports (Notteboom 2007). As a response ports changed their traditional role, which was cargo accommodation between sea and land transportation, by the provision of VAS and a focus on supply chain integration (Demirbas et al. 2014). Consequently the contemporary understanding of ports as business networks or clusters of interdepended organisations which cooperate for the holistic development of the system (van der Lugt et al. 2013), emerged.

However, UK container ports were focused solely on the traditional provision of cargo and ship handling services. As a result UK container ports lost their competitiveness to European mainland ports which were promoted as logistics platforms (Pettit and Beresford 2009). However, during the early 2000s UK port operators realised that increased benefits could be derived by the on-site provision of warehousing and logistics VAS, in addition to their core offerings. Mangan et al. (2008) define this strategic shift of ports as Port Centric Logistics (PCL).

Despite some critique PCL is referred to by many authors as a contemporary ports' strategy. Additionally, UK retailers and port sectors embraced the concept. PCL has been introduced as a way for regional ports to differentiate and compete with major ports in the South of UK. However, latter developments at major southern container ports indicate that PCL is a dominant UK port development strategy (Wilmsmeier and Monios 2013).

In this paper PCL is viewed as a lagged strategic response of UK ports to practices already applied at other parts of the world. Additionally, this paper aims to relate PCL with the concept of servitisation by a systematic analysis of the PLC literature through the lens of the servitisation drivers. Furthermore, this paper intends to view PCL as a strategic decision that can enable UK ports to reform their operations strategy, which according to Slack and Lewis (2008) can enable an organisation to gain competitive advantage (CA) and superiority in their environment.

Design: The design of this research is divided in two phases. The initial phase involves the development of a conceptual framework, while the second is the validation of this framework. In particular the proposed conceptual framework is designed according to the findings of a two stage literature review. A classification of four groups of drivers for servitised manufacturing organisations is derived by the first stage of the literature review. These drivers namely are financial, strategic, marketing and environmental. For each of these drivers a particular set of propositions was created. The classification developed so far is used as the basis of a systematic review and analysis of the existing academic literature on PCL. For the purpose of this review the four step methodology proposed by Seuring and Müller (2008) was followed. Each of the propositions of the first phase was adopted according to PCL literature. From this process the nine propositions that comprise this conceptual framework were created.

The study adopts the view of ports' tangible assets as resources upon which services are delivered (Penrose 1959, Spring and Araujo 2013). Additionally, the view that services are valuable intangible resources of a firm characterised by increased heterogeneity and inimitability due to the lack of a distinct market for services (Herrmann 2005, Molloy et al. 2011) and the fact that they are the result of each company's mix of formal and informal procedures (Slack and Lewis 2008) is also adopted.

The validation of the proposed framework will be conducted by two rounds of interviews. The initial interview phase involves managers from the ports that have already adopted PCL strategy. The second phase involves port users, such as 3PLs and retailers. This practice

will enable the identification of similarities and differences among the perception of PCL effects between different entities within a port network.

Findings: The analysis of the two literature streams identified considerable similarities between the two concepts. Nine propositions have been created that support the consideration of PCL as a servitisation strategy of UK container ports. According to those propositions PCL enables a port to experience increased profit margins and additional stable revenue streams due to the provision of VAS. Furthermore, PCL has the potential to enhance the value capabilities of a port and thus achieve competitive advantage and sustainable competitive advantage by the provision of VAS which are inimitable and rare intangible resources of a firm. Theoretically, PCL can also be perceived as a differentiation strategy for ports. However, recent developments characterise PCL as a common strategy of UK container ports and not a differentiation strategy. Moreover, several marketing related advantages are anticipated by the adoption of PCL strategy. These advantages are related with the ability of a port to enhance the spectrum of its offering's by the provision of logistics VAS at the points of import. Thus responding to the increased demand of those services and tailoring its offerings as solutions to each specific customer. Additionally, PCL is anticipated to create customer loyalty and supplier dependency that will develop transactions into long term relationships. Finally, PCL is expected to result in environmental benefits for ports and its users based on increased container load utilisation and reduction in road kilometres.

The validation of the framework will enable the evaluation of the proposed framework and the realisation of the intention of this paper to support that PCL positively affects the operations strategy of a port in order to gain CA and superiority in its environment. Particularly, Slack and Lewis (2008) argue that operations strategy is determined by the decisions that frame the long term capabilities of all the operations and its contribution to the organisational strategy, through the merge of the market requirements with operations resources.

Keywords: Servitization, Port Centric Logistics, Operations strategy.

Índice

Servitization and firm performance: The impact of internal and external service capabilities over the firm life cycle

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Abstract

Objetives: Although prior research on servitization emphasizes its strategic role in product-dominant firms, there is only scarce empirical evidence on how servitization influences firm performance. Moreover, this extant evidence is often vague and suggests a complex relationship between servitization and firm performance. There is also a lack of understanding on how different environmental and firm contingencies influence this relationship.

The purpose of our paper is to improve the understanding of the relationship between servitization and firm performance by studying how firm-level capabilities related to service provision influence firm performance, and how the impact of these capabilities are moderated by firm life cycle. We propose that product-dominant firms need to develop capabilities for service provision, and to modify these capabilities over the life cycle of the firm.

Methods: Based on prior literature on servitization, strategic management and service operations management, we first introduce the concepts of internal and external service capabilities. These two concepts are related to service operations management and service marketing perspectives, respectively. Again, drawing on extant literature, we develop two hypotheses on how service capabilities influence the performance of product-dominant firms,

and two hypotheses on how firm life cycle moderates the relationships between service capabilities and firm performance.

We tested the hypotheses on a sample of firms from the Finnish software industry. Given the lack of prior empirical research, we developed new scales for measuring internal and external service capabilities. To avoid common method bias, we used data from publicly available sources for control variables and firm performance. Using OLS regression on a dataset with 222 observations, we tested the impact of service capabilities on both return on sales and return on assets.

Results/Findings: Exploratory and confirmatory factor analyses of the internal and external service capability scales supported the division of service capabilities into these two components. The regression analyses for both measures of firm performance provided support for three out of four hypotheses. This means that external service capability has a positive effect on firm performance and that this relationship becomes weaker over the life cycle of the firm. In contrast to our hypotheses, the observed impact of internal service capability on firm performance had a negative effect on firm performance. But, the negative influence of internal service capability becomes weaker over the firm life cycle. To confirm our conclusions about the moderating role of firm life cycle, we also generated diagrams over the interaction terms for various values of firm life cycle.

Implications/Conclusions: Our study provides empirical evidence on the strategic impact of servitization on firm performance. First, by theorizing about service capabilities, our study suggests that product-dominant firms need to invest in firm-level capabilities for service provision. As indicated by our empirical analysis, these capabilities have an impact on firm performance that does not depend on the detailed structure of the firm's offering. Service capabilities are thus beneficial to all servitized firms irrespective of their specific offering.

Second, by proposing that service capabilities can be divided into internal and external components, our study highlights that firm capabilities related to servitization are not monolithic but more fine-

grained, as the impact of different type of capabilities can have opposite effects on firm performance.

Third, our results suggest that firm life cycle moderates the impact of service capabilities on firm performance. This implies that service capabilities are not static but need to be adapted as the firm and its competitive environment changes, and that firm life cycle is a moderator that influences the impact of servitization. Our findings suggest that external service capability is more crucial in early stages of the firm life cycle, while internal service capability becomes important later as the firm and its market mature.

Our paper also contributes to research on servitization by providing additional empirical evidence of servitization outside the traditional industrial firms by focusing on software firms. This adds to our understanding of the phenomenon and possible impact of industry-specific factors on the phenomenon.

Managerially, our study clearly suggests the importance of developing service-related capabilities in product-dominant firms. By dividing service capabilities into internal and external components, we suggest that these firms need to be more specific on what kind of capabilities they develop. Furthermore, our results also indicate the importance of matching the balance between these two different service capabilities with the life cycle of the firm and its market, as a mismatch can have a negative impact on firm performance.

Keywords: Servitization, Capabilities, Firm life cycle, Firm performance.

Índice

Smart Co-creators vs. e-retailers: An analysis of power in the digital value chain

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Abstract

Objetives: *Business Model* refers to the design of the value creation mechanism, delivery to consumers and capture or appropriation of their surplus (Teece, 2010). Supply chains as descriptors of business models provide processes of value creation and value delivery which are often performed by a number of different companies. The supply chain in creative sectors (i.e. books, music, motion pictures) contains three agents relevant to this study: authors/artist, publishers, and retailers. Authors/ artists are originators and creators of content. Publishers hold and manage the property rights of content. Retailers offer the content to end users using a broad range of sales channels (Vendrell-Herrero et al., 2013). Recent research has proven that authors obtain greater benefit when employing such intermediation services (Broekhuizen, Lampelb & Rietveld, 2013; Hracs, 2013). Therefore, in this research the authors and publishers are considered as co-creators of value.

In creative industries *Servitization* is a natural business model response (Adner, 2002) to disruptive digital innovation e.g. MP3 technology, internet etc. (Tidd, Bessant & Pavitt, 2005). Retailers of

creative content diversified from product-centric business models to providing bundles of physical and digital formats, requiring new forms of contracts with the publishers (Parry, Bustinza & Vendrell-Herrero, 2012). The resultant digital offerings have changed the value expectation and perception of consumers and industry revenues have decreased (Bustinza et al., 2013). Servitization opened the market to new entrants exploring novel value delivery mechanisms, such Spotify in the music industry, Netflix for film and Amazon who began in books diversified across most sectors. Whilst there have been many failures (Rosenzweig, Laseter & Roth, 2011) a small number of these explorative new entrants have been very successful, increasing their profits (i.e. the price of Amazon shares increased from $40 to $300 during the last decade) and their power[1] in comparison to traditional retailers in physical product value chains. In contrast the profitability of publishers (Myrthianos et al., 2014) and artists (Byrne, 2012) is decreasing in the digital arena.

Evidence signals increasing rivalry and shifts in power within the process of value capture in the digital value chain. Cox (1999) defines power as an unbalanced relationship in which one company in the value chain has the capacity to appropriate most of the value generated. Employing this definition within the publishing sector this work sheds light to the business market conflict in two different ways. First, the work models the pricing strategy of publishers and e-retailers and derives theoretical propositions for their competing strategies. Second, the article develops novel empirical applications with extensive consumer dataset to validate the theoretical propositions. A final validation is provided by industry through interview and feedback on the strategies and propositions.

Methods/Context: There is an increasing debate with regards to the pricing strategies of retailers in the publishing sector. Previous literature has focused on complementarity between device and content (Yu, Hu & Fan, 2011) or pricing strategies of digital format to libraries (Besen & Kirby, 2014), but understanding of consumer

[1] See this article in New York Times describing the rivalry in the digital value chain http://mobile.nytimes.com/blogs/bits/2014/05/23/amazon-escalates-its-battle-against-hachette/?hp

surplus and worth value (Lepak, Smith & Taylor, 2007) in terms of consumer surplus for different agents in the supply chain remains unresolved. The first objective is therefore to draw a detailed value chain for eBooks (see appendix). The supply chain reflects the inherent conflict between creators, publishers and retailers within the market. Retailers are willing to make greater discounts providing they have large portfolios and know that the willingness to purchase will increase in line with frequency of visits and purchases on their website. E-retailers look to protect their business model by setting barriers to entry for competitors by employing their scale to reduce the price of key offers. The price reduction strategy may benefit the e-retailer, but creators and publishers benefit from prices that maximize profits. Therefore, when the e-retailers hold the power (Armstrong, 2006) the market price will be lower than the profit-maximizing price, and when the publisher or creator holds the power (Rysman, 2009), the price will be close to the profit-maximizing price.

Market price can be directly observed but a good understanding of consumer surplus and the profit-maximizing price requires evidence from the demand function. To accomplish this, authors gained access to a unique and independent book publishing industry dataset comprising 8,000 consumer surveys for UK and US in 2013. Exploiting this information the demand functions for eBooks compared to physical books was estimated to act as the anchor (Jones-Lee, 1989). The demand functions are developed through a Payment Card, where the consumer is asked to choose between a fixed price of the physical book and its eBook version which is offered at varied price points from below to above the reference physical product's price. The stepwise variations are presented sequentially until the consumer switches (or not) from one offering to the other. The switching point price difference is then used to determine the consumers' willingness to pay for the new offering - see Ryan and Watson (2009) for more details- and the demand functions.

Results/Findings: Retailers have full access to transactional data, which allow them to make informed decisions based on real consumption patterns (Parry, Vendrell-Herrero & Bustinza, 2014). Retailers don't share this detailed information with publishers, as it

is both a source of competitive advantage and power in the supply chain. Publishers have developed their own data collection methods, investing in extensive surveys. The evidence provided comes from a publisher's consumer survey and is based on a quasi-natural experiment, focusing exclusively on the demand functions for novels and distinguishing between two forms of novels: classic and modern. The main difference of these forms of novels is who owns the property rights: modern novels (i.e. Harry Potter) have well defined property rights and this provides the publisher greater power in the relationship and allows them to set the prices; classic novels (i.e. Romeo and Juliet) have property rights which frequently not adequately defined, if they exist at all, and hence the retailer has much greater power in price setting.

Analysis of publisher surveys suggests that the demand function can be predicted with high precision with the payment card method ($R2 = 97\%$). With the demand function it is feasible to estimate the price that maximizes revenues. Industry also provides the average profit margin for physical and digital books. With this information we proceed to estimate the point that maximizes profits of the physical and digital bundles of books. The findings validate the theoretical proposition above, suggesting that while classic novels in eBook format are discounted 50% in US and 20% in UK respect to the profit-maximizing point; modern novels are not discounted at all.

Implications/Conclusions: This article models the differences in strategy and power between e-retailers and e-publishers when setting the prices for eBooks. Findings suggest that there is an important degree of rivalry between them. This result is relevant for practitioners in creative industries and competency courts, and provides a better academic comprehension of how empowerment distorts B2B relations throughout the value chain (Cox, 1999).

The work also has important caveats, for instance there is no evidence from the market of heavily pirated content (i.e music or textbooks). Future work also should correct for hypothetical bias in surveys, eliciting demand functions in the lab (Camacho-Cuenca et al., 2004).

Keywords: Power, Business models, Digitalization, Consumer surplus, value chain.

Índice

Digital business models and national competitiveness

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Abstract

Objetives: The Resource-based View suggests that resource bundles may be combined to create value propositions and capture value (Mills, Platts & Bourne, 2003; Vargo & Lusch, 2004, 2008) a process which may be framed using business model theory (Teece, 2010). A firm may provide a number of different product-service offerings using their portfolio of resources, creating Product-Service Systems (PSS) (Neely, 2008). PSS introduction requires an epistemological shift in value, from understanding the 'value in exchange' of product ownership business models to understanding 'value in use' created through access to resources in a service system business models (Macdonald et al., 2011; Barnett et al., 2013; Thenent et al., 2014).

Analysis of PSS and digital business models usually takes a qualitative perspective, and hence literature on PSS is open to further theoretical development through quantitative approaches providing robust assessment of benefits and drawbacks (Tukker, 2013). Studies are limited due to a scarcity of reliable consumer databases which allow analysis of service-oriented business models (Sampson, 2012). This paper contributes to theory by filling a gap in

literature through the development of a methodology that establishes the link between customer demand and the product and digital service portfolio offered across 10 different countries. The objective of this paper is to respond empirically to the following research questions:

(1) Are current digital business models satisfying consumer needs?

(2) What is the linkage between digital business models and national competitiveness?

Context/Method: A unique music industry dataset comprising information for 10 countries in 2010 is used. The work exploits a combination of real market sales data from IFPI and data from almost 20,000 customer surveys provided by a major music-licensing firm (Bustinza et al., 2013). Information related to consumers permit the estimation of demand functions based on logistic regressions. The demand functions are estimated for two groups – tangible product (taken to be all physical sales) and intangible-digital service (taken to be all digital sales) – as very rarely will a consumer purchase the same content in different formats (Koukova et al., 2012). Music demand is modelled as a function of individual consumer's specific characteristics, consumption behaviour, and country specific effects.

The estimated demand functions or country-average willingness to purchase music are compared graphically with the structure of music offered – from a continuum of pure product offering to a diverse portfolio of digital services – in each country. This analysis allows the estimation of the business model challenge for each country. That is, the gap between what the industry offers and what the consumer desires or expect. The measure of business model challenge can then be correlated with indexes from the competitiveness forum (Sala-i-Martin et al., 2012).

Results: The logistic regressions explain between 15 to 20 per cent of the decision to purchase digital or physical music format respectively. The estimated demand functions show that the average likelihood to purchase digital music is highly heterogeneous across countries. There is larger preference for digital music in

Anglo-Saxon countries including UK, US or Australia. Latin countries like France, Italy and Spain have the lowest preference for digital music. Similar heterogeneity is found for physical format suggesting that Anglo-Saxon countries are more willing to purchase music.

The preference of consumers for digital format is normalized by dividing it by the preference for physical format. This produces a homogenization of preferences around the globe, demanding between 50% and 60% of total music offering in digital format. At the moment of performing the study the sales of the industry were still product-centric, generating a common business model challenge for all countries; namely the development of a larger portfolio of digital offering. The country with the lowest business model challenge in 2010 is US and the highest are Japan and Spain.

The business model challenge negatively correlates with overall competitiveness, and measures of digital technology introduction such as connectivity and computers per capita.

Implications/Conclusions: This paper provides a new empirical methodology to understand the opportunity gap between business models value propositions. The case study work is sector specific but the results and methods can be considered for use in other creative industries such as publishing or motion pictures (Parry, Bustinza & Vendrell-Herrero, 2014). Results are also relevant for the private sector. The success of a product-service combination is determined by good understanding of market demand. Appropriate resource bundles can then be co-produced and dialog with customers undertaken to educate partners as to the value of the proposed offer (Vargo & Lusch, 2008).

Our measure of business model challenge is negatively correlated with national competiveness. This does not demonstrate causation; however, it suggests that there may be relevance for governments embarking on soft innovation policies, incentivising and encouraging the development of product service portfolios in the private sector. Some initiatives have been developed in that direction (see European Commission, 2011) but this is still in its inception stages.

Keywords: Business model, Digitalization, Music industry, Product-Service portfolio, National Competitiveness.

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Índice

Extending manufacturing towards service-oriented business models: The T-REX technological levers that support this extension

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Abstract

The European project (T-REX[2]: Lifecycle extension through product redesign and repair, renovation, reuse, recycle strategies for usage&reusage-oriented business models) is targeting the development of specific technologies and tools (grouped into four different 'levers') that will empower the companies (specially SMEs) in the development of advanced service-oriented business models for new Product-Service Systems (PSS) offering, or in other words, to promote a shift from value in exchange to value in use for customer needs satisfaction.

To support such transition, in the capital goods industries, from the "traditional" business models to the "new" service-oriented business model four different 'levers' will be developed: a platform to develop new service-oriented Business Models (BM), improved design of products considering their lifecycle (Design for X techniques), re-engineering of traditional support services (Services Engineering) and integrated local Condition Monitoring (CM) systems and tools for assets and fleets Prognostic Health Management (PHM), customizable to industry requirements in order to increase availability and reduce Life Cycle Cost.

[2] http://t-rex-fp7.eu

Therefore, T-REX aims to develop and experiment conceptual tools within three practical case studies focused on industrial partners target sectors, i.e. in the forklift trucks, the machine tools and the robot solutions domains.

Final results will try to reduce operational maintenance service costs, increase reuse of components and extend the life cycle, with a global reduction in the Life Cycle Cost in the range of 25-30%.

Keywords: Reuse, Repair, Rental, Maintenance, Manufacturing; Servitization; service-oriented business models.

Introduction

The current economic downturn and the global economy competitiveness are pushing many sectors related to manufacturing industry to adapt to an ever-changing business environment looking for new ways to diversify their business (Takata, 2013). In particular, there is a trend for manufactures producing and selling durable products towards selling the usage of the product (e.g. renting, pay-x-use) or even selling the product performance (e.g. pay-x-performance). All these emerging new trends fall within the concept of 'servitization' of manufacturing (Vandermerwe and Rada, 1988; Wise and Baumgartner, 1999).

However, these new business, even tough with a low-level of maturity (i.e. renting lacking a more comprehensive perspective), completely change the manufacturer's perspective over the costs and revenues arising during the product lifecycle. The relevance of concepts such as Total Cost of Ownership (TCO), life cycle extension or maintenance management strongly increases (Takata et al, 2014), and thus the reduction of costs related to the product usage and maintenance is mandatory in order to achieve a profitable business, even at the expenses of higher costs related to materials, production processes, and supporting technologies. Over time, this new business led to a more distributed and stable revenues coming from a wider after-sales services portfolio related to the operation and

maintenance of the equipments. In addition, such models entail environmental benefits too through increased duration, renovation and reuse of product modules.

This is an important change, and there is today a limited diffusion of new business models, especially on manufacturing SMEs. Despite the expected benefits at a company and societal level, the transition towards such models is slow and mainly concerning large multinationals manufacturers. Smaller firms often lack managerial vision, competence and resources to revolution their Strategy, Organization (internal and inter-firm), Product Design, Maintenance/Repair/Renovation Services and Economic Performance Measurement Systems (towards customer lifetime value). More often than not, capital goods manufacturers act as pure suppliers of pieces of equipment while they neglect the opportunities stemming from a more service-oriented approach. Thus, they tend to lose control over their installed base, and fail to achieve the customer intimacy that is quintessential to devise and offer customized products and services.

One way to overcome this is to empower companies, and specially SMEs, with technologies that can aid them to understand the benefit of each business alternative, as well as to assist in the deployment of these new models. In particular, the main concept is to work on integrated product-service solutions or Product-Service Systems (PSS), promoting the shift from value in exchange to value in use for customer needs satisfaction (Tischner et al., 2002; Tukker, 2004).

As a consequence, we think main stress should be put on reducing the Life Cycle Cost of the Product-Service Systems and extending their lifecycle in order to maximize profits, but also to increase customer utility and the lifecycle value of their offerings.

T-REX project

The points cited above are the main motivation of T-REX[3] project. This project has started in October 2013 to support companies to

[3] Lifecycle extension through product redesign and repair, renovation, reuse, recycle strategies for usage&reusage oriented business models

satisfy current customer needs, enhance the company's performance, enabling to diversify its business and achieve a competitive advantage. In particular, defining and implementing a new Product-Service Systems (PSS) offering is a demanding process that must be supported by four 'levers', the first focused on innovation of new service-oriented Business Model (BM) configuration and the remaining based on products-services lifecycle extension and Life Cycle Cost reduction, with the use of technologies related to Design for X (DfX), Services Engineering (SE) and Condition Monitoring & Fleet Management (CM/FM). The objective of these levers is to support the application of service-oriented business models, especially within SMEs, in a context of a lack of a business model approach that guides companies in the servitization process.

Therefore, T-REX project aims to support such transition by developing and experimenting conceptual tools within three practical case studies in the transportation (forklift trucks), machinery (machine tools) and automation (robot solutions) domains. In order to cope with these objectives it has been required to develop a business platform whose main elements are:

- A Business Model suited for the new landscape that changes the way products are offered and customer relationships managed;
- Product design techniques to extend the lifecycle, to foster upgrading and renovation, and to support serviceability;
- Service design methods for the (re-)engineering of existing services;
- Integrated local condition monitoring capacities and tools for asset Health management, customizable to the industry requirement;

T-REX consortium is composed of 10 partners from 5 different countries. The industrial partners are key players in their European target sectors, and are supported by research universities/centres and technology providers with specific background in each area of this project.

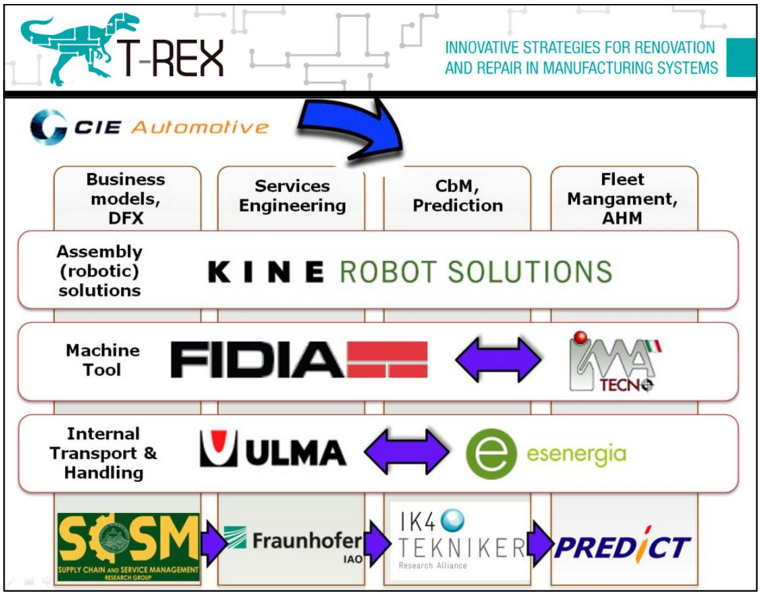

Figure 1. T-REX consortium and its main activities

Background and preliminary research

Maybe the main characteristic for the proposed new service-oriented business models is that they do not necessarily require the transfer of product ownership from the manufacturer to the customer, with the consequent transferring of business risk from the customer to the manufacturer (Oliva and Kallenberg, 2003; Baines et al., 2009). The customer pays for using an asset, rather than its purchase, and so reduces risks and costs traditionally associated with ownership. In fact, in the new business model all the costs arising in the product's lifetime, from early conception to disposal, are suffered by the manufacturer and must be covered by the periodical bills delivered to the user, according respectively to the product's usage or its performance in field. This is precisely why pay-x-use or pay-x-performance agreements have to be based on a sound Life Cycle Costing (LCC) or Total Cost of Ownership (TCO) approach. From this standpoint, it is in the manufacturer interest to provide for as long a product's lifetime as possible since any

product‘s replacement would decrease sales (according to the product‘s unavailability or loss of performance) and increase costs (according to the product‘s production variable costs).

New business models that do not transfer the product ownership offer and opportunity to redesign the products, the (after-sales) services and the (after-sales services) supply chain, as well as manufacturer-customer (ongoing) relationship and (lifecycle) revenue models. The main differences arising from this new point of view have been collected in the following table.

To gain preliminary insights in this topic and better understand the level of service orientation of business models in capital goods industries and their actual market strategies, an exploratory survey has been carried out on 95 European companies that operate in three main sectors addressed by T-REX project (Saccani et al., 2014): Transportation (forklift trucks), Machinery (machine-tools), and Automation (robot systems).

For the present study, the Supply Chain and Service Management (SCSM) research group of the University of Brescia has developed a research framework consisting in an extension of the Business Model Canvas (Osterwalder and Pigneur, 2010) as a methodology to define new service-oriented business models. This model has two more variables which take into account contextual factors that influence the business model development and its relations with the company strategy. The model was also enriched with two additional layers (Adrodegari et al., 2014): drivers (e.g. internal or external elements that drive firms to develop new business model) and obstacles (e.g. internal or external elements that slow down the adoption of new business model). The rest of the nine variables considered in the model are the same building blocks of the Canvas, this is, value preposition, key activities, key resources, partnerships, channels, customer relationships, customer segmentations, revenue model and cost structure.

	"traditional" business models	"new" business models
Product design	- Product is designed for the minimum cost - Lifetime should be enough	- Product cost is less important. The relevant is the Total Cost of Ownership. - The product is conFigured for the application. - Product lifetime is enlarged.
Services, supply chain and customer relationships	- Product developer establishes conservative preventive maintenance policies. Maintenance is made in house or BY third parties - After-sales services, mainly technical assistance and spare parts, are sources of revenue for the manufacturer (or third parties)	- Product developer make extra effort to minimize maintenance cost: leveraging on techniques and tools to optimise preventive and emphasize on prediction - Services allow to increase the product availability
Customer relations and Cash flows	- Product sales as a one-off transaction - In the usage and end-of-life phase interactions between the manufacturer and the customer may not occur - If they occur their monetary value is often negligible compared with the product value - Product developer is not aware of the conditions in which the product is in operation - Dismantling is in charge of the user	- Product-Service Systems provision as a relational, long-term process - Stable and continuous cash flows from customer to manufacturer over the product lifecycle, of a smaller entity compared to product sales - Cash flows cover both the product and service component of the offer - Product developer is aware of operating conditions - Information from the product is collected to increase product availability (e.g. Condition based Monitoring), increase service efficiency (e.g. remote control/diagnosis) and transform the feedback from the field in input to the design of new products and services - End of life is in charge of the producer. Some modules could be re-used

Table 1. "traditional" vs. "new" business models

Initial findings and Ongoing work

Descriptive analyses have been performed on collected answers in order to identify existing outstanding gaps/barriers and drivers in the development or adoption of the new service-oriented business models, complementing this research with exploratory partners'

case studies analyses in the three target sectors and with a literature analysis of other best-in-class case histories. Gaps were classified in four different categories (i.e. market and business related risks, financial risks, and technological risks, divided into external threats and internal development weaknesses), paying particular attention on how they can affect the development of the 'levers'. Lastly, a set of actions intended to overcome all these barriers were identified, linking them to the corresponding description of the 'lever' that is going to support/solve them. The main findings emerged from the empirical research can be summarized as:

- The adoption of service-oriented business models is low in the studied industries, in particular with regards to the machine tools and robotics sectors; revenue models are dominated by product sales, with a contribution of services close to 20% dominated by corrective maintenance and spare parts sales. Rental or "pay-per-x" contracts are an almost negligible revenue source.
- Service offerings are still mainly anchored to traditional services.
- The transportation industry is a step ahead the machinery and automation one in the journey towards new usage-oriented business models.
- Service is an important part of company's business and its importance will increase in future. However, most companies have not yet formalized the service development activities, with no explicit strategy, responsibilities, budget, formal processes and methods in place.
- Product design practices aimed at modularity and reliability are in place in a number of companies, while products/components reuse, recoverability and serviceability are rarely supported since the product design phase by formal techniques.
- Fleet operation and maintenance practices are carried out by companies on less than 50% of the installed base, generally through direct field engineers.
- Information systems and automation have a great unexploited potential.
- Customer relationships are still dominated by a traditional approach. They are transaction-based, and customers' culture

is perceived as an obstacle to develop and offer "pay-per-x" contracts.

The aim of T-REX project is to support such transition by developing and experimenting conceptual tools within three practical case studies focused on industrial partners target sectors, i.e. in the forklift trucks, the machine tools and the robot solutions domains.

Based on these preliminary findings, a revision of the three T-REX case studies has been performed in order to identify the ideal level that each company should achieve in the development of its usage-oriented business model. In addition a General Framework to select, develop, implement and validate these service-oriented business models has been designed considering the particular actions to be deployed by each lever to support products (DfX) and services (SE) design, Condition Monitoring and Fleet Management (CM/FM).

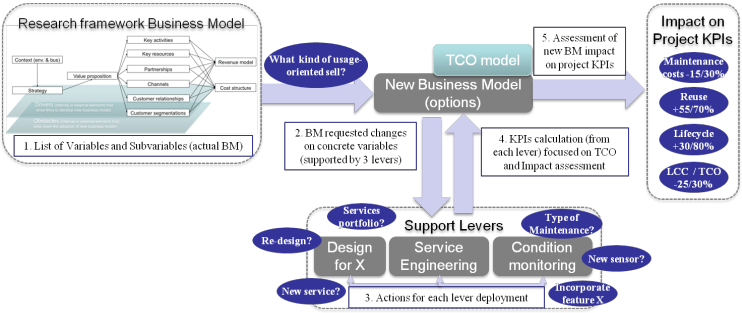

Figure 2. T-REX General Framework for new service-oriented Business Models deployment

This General Framework states five steps where the collaboration between BM development and technology levers is structured, and that are being handled within T-REX project:

- List of variables and subvariables: To assess the actual characteristics of the organization (according to the current research findings) and to identify possible needs or chances to develop new business (Business Model design).

- BM requested changes: Design of the three support levers to cope with new business models needs as well as to plan possible interoperability between all of them.
- Actions for each lever deployment: To select which are the best alternatives, regarding levers application, and the required actions to be carried out.
- Key Performance Indicators (KPIs) calculation: To implement selected solution and to calculate indicators that will also be linked to the Total Cost of Ownership (TCO) assessment based on the new business model findings.
- Assessment of new BM impact on project KPIs: To assess additional project KPIs related to costs reduction and lifecycle and reuse extension.

This framework has more importance as the complexity of the technical systems increases, widening possible scenarios for after-sales services where maintenance, repair, renovation, reuse and recycling of such systems take on growing importance.

Within this framework, the design of products, services and production systems can benefit from the adoption of a modular approach as a lever to enhance the reparability, renovation and upgrade of products and systems. Modularity is enabled itself by specific design methodologies that adopt the Design for X (DfX) approach.

The key role played by services during a product life emphasizes the need to consider their usage since the concept phase. The design of the support processes needs to be developed in parallel with the design of the product. Services Engineering (SE) has emerged as a new research area, which is concerned with the systematic development and design of service products attempting to efficiently utilise existing engineering know-how.

At the very end, the goal is to have a structured framework to deliver project objectives related to the new BMs, which are as high as:

- Decreasing maintenance service costs by 15-30%.
- Increasing reuse of components and modules for 55-70%.
- Extending assets lifecycle on 30-80%.

If such results are achieved, it will be also translated to a global reduction in the Life Cycle Cost (LCC) in the range of 25-30%.

The maintenance lever

Manufacturing equipment maintenance has evolved from breakdown maintenance to time-based and predictive/proactive maintenance, and finally to proactive maintenance based on prediction and prognostics. Condition based Maintenance (CbM) can be only performed when a failure can be predicted by means of Condition Monitoring (CM). CbM capabilities are extended by Prognostic Health Management (PHM) approach, where systems are working to overcome unscheduled maintenance problems by integrating all the condition monitoring, health assessment and prognostics into an open modular architecture, and then further supporting the operator by adding intelligent decision support tools (Bengtsson et al., 2009). This approach is even more significant when considering renovation and reuse within fleet wide dimension (Fleet-Wide PHM).

Partial results arising from the survey study suggests that the practices regarding fleet operation and maintenance (CM/FM) are lower than regarding other levers such as Design for X (DfX) or Services Engineering (SE). This implies a lot of room for improvement, especially in domains such as manufacturing or automation (e.g. robotics), taking also into account the perceived importance of some practices among T-REX use case participants, such as remote diagnostics.

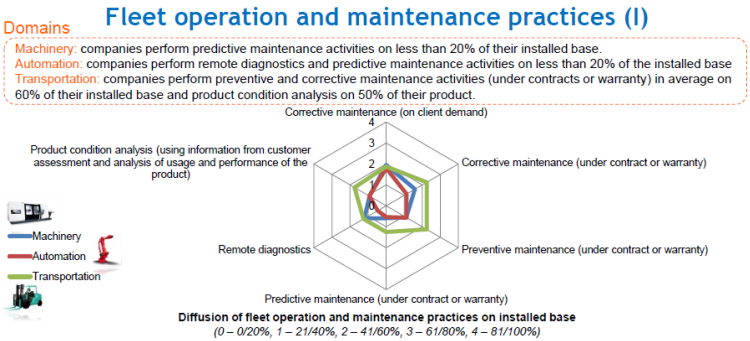

Figure 3. Fleet operation and maintenance practices (Saccani et al., 2014)

Having this in mind, the improvement of maintenance practices is based on two key pillars (Jardine et al, 2013): the existence of new technologies that helps in the inclusion of these practices, and the appearance of new simulation tools capable of providing a complete understanding on different maintenance strategies requirements and impacts.

Concerning the identification of best alternatives, Arnaiz et al. (2013) shows the development of a continuous improvement cycle concerning maintenance activities, including a simulation tool to evaluate condition-based technologies. Common techniques, standards and tools for different strategies evaluation are applied to take cost-effective decisions, mainly relaying in the incorporation of new technological embedded monitoring devices and faults prediction/prevention technologies as support for remote maintenance (e-maintenance). A graphic that shows an example of how, for a particular component, manual activities related to monthly inspections or preventive yearly replacements are not the right approaches while corrective and monitoring strategies have lower costs over its lifecycle.

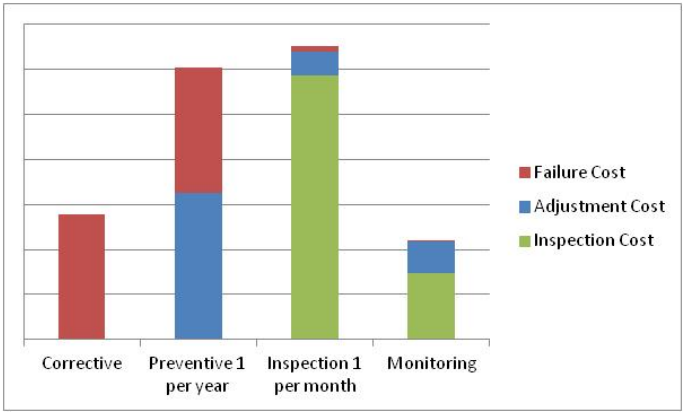

Figure 4. Results of a cost-effectiveness analysis where maintenance strategies are compared (Arnaiz et al., 2013)

This is coherent with the latest results on the perceived importance of certain tools, such as use of smart sensors or condition monitoring tools is perceived for an adequate maintenance service provision (Holgado, 2014). At the same time, the EC is promoting the use of smart devices and systems based on ICT when renovating or upgrading existing products for new assets management methods along its entire lifecycle. Maintenance importance is remarked in twofold: on one hand to make new business profitable, and in the other hand to expand maintenance service portfolio in industrial sectors.

Conclusions

Even though T-REX project has started recently, preliminary findings of the project are coming from:

- Developing a Research Framework consisting in an extension of the Business Model Canvas to guide the data collection and the analysis of the empirical research.
- Conducting an extensive Survey among European industrial companies on actual marketing strategies and on the current adoption of usage-oriented Business Models in the domains of transportation, machinery, and automation.

- Analysing Survey answers, together with other best-in-class case studies and industry reports as well as in-depth study of T-REX industrial partners target sectors (forklift trucks, machine-tools, and robot systems).
- Analysing persisting Gaps and Obstacles to find out how firms should reconfigure their Business Model in order to make it more usage-oriented.
- Defining a General Framework for new service-oriented Business Models deployment and identifying five deferent business model typologies in order to give insights on how companies can shift from ownership-oriented to service-oriented Business Models.
- Designing of techniques, tools and guidelines for the development of new Business Models and for the new services portfolio definition.
- Defining Condition Monitoring specifications for the three domains (machine tools, forklift trucks and robot systems), designing of embedded monitoring devices and defining of architecture for the fleet-wide remote Asset Health Management.
- Identifying suitable new service-oriented Business Models for each of T-REX target sectors and selecting accordingly use cases to demonstrate expected outcomes.

This process should provide any managerial team the necessary insights to identify, develop and implement new service-oriented business in a successful way, by considering in advance all the required models and technologies to support such transition.

Acknowledgments

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References

Adrodegari, F., Alghisi A., & Saccani N. (2014). Towards service-oriented business models: a survey of capital goods companies. *Proceedings of the 21st EUROMA conference*, Palermo (Italy), 20-25th June 2014.

Arnaiz, A., Konde, E., & Alarcón, J. (2013). Continuous Improvement on Information and On-line Maintenance Technologies for Increased Cost-effectiveness. *Procedia CIRP*, 11, 193-198.

http://dx.doi.org/10.1016/j.procir.2013.07.038

Baines, T.S., Lightfoot, H.W., Benedettini, O., & Kay, J.M. (2009). The servitization of manufacturing: a review of literature and reflection on future challenges. *Journal of Manufacturing Technology Management*, 20(5), 547-567.

http://dx.doi.org/10.1108/17410380910960984

Bengtsson, M., & Salonen, A. (2009). On the Need for Research on Holistic Maintenance. *Proc. 22nd International Congress on Condition Monitoring and Diagnostic Engineering Management*; p. 165-172.

Holgado, M. (2014). Report on the results of the survey *Technological choices for maintenance service provision*. Extract of Maria Holgado's PhD thesis results. 29th September 2014, Milan, Italy.

Jardine, A.K., & Tsang, A.H. (2013). *Maintenance, replacement, and reliability: Theory and applications*. CRC press.

Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management*, 14(2), 160-172.

http://dx.doi.org/10.1108/09564230310474138

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. John Wiley & Sons, Inc., Hoboken, New Jersey.

Saccani, N., Adrodeghari, F., & Alghisi, A. (2014). *European Survey on the adoption of usage-oriented Business Models: main findings*. Extract from project deliverable D1.1 of T-REX project. March 2014. Brescia. Italy

Takata, S., Kimura, F., van Houten, F.J.A.M., Westkamper, E., Shpitalni, M., Ceglarek, D., & Lee, J. (2004). Maintenance: Changing Role in Life Cycle Management. *Annals of the CIRP*, 53/2 (2004/8), 643-655. http://dx.doi.org/10.1016/S0007-8506(07)60033-X

Takata, S. (2013). Maintenance-centered Circular Manufacturing. *Procedia CIRP*, 11, 23-31. http://dx.doi.org/10.1016/j.procir.2013.07.066

Tischner, U., Verkuijl, M., & Tukker, A. (2002). *Product service systems: Best practice document*. SusProNet, 133.

Tukker, A. (2004). Eight types of product–service system: Eight ways to sustainability? Experiences from SusProNet. *Business Strategy and the Environment*, 13(4), 246-260. http://dx.doi.org/10.1002/bse.414

Vandermerwe, S., & Rada, J. (1988). Servitization of Business: Adding Value by Adding Services. *European Management Journal*, 6, 314-324. http://dx.doi.org/10.1016/0263-2373(88)90033-3

Wise, R., & Baumgartner, P. (1999). Go downstream: the new profit imperative in manufacturing. *Harvard Business Review*, September/October, 133-141.

Índice

Mobilise Europe: How to support innovation in mobile services

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Introduction: Objectives and rationale of EMMIA initiative

The future is mobile, this unbroken trend shows all over: through increasing numbers of services booked via mobile platforms, through the new apps published in mobile app stores and through downloaded applications on smartphones and tablet PC, not to talk of mobile hardware itself. Question is what are Europe's efforts to gain a fair share within this thriving market? The last success story seems to have been the roll-out of the GSM standard of mobile phoning more than 20 years ago.

One of the efforts of the European Union to improve on the situation is the investments in space infrastructures like (1) the European Global Navigation Satellite System Galileo and (2) the European Earth Observation program COPERNICUS. Both services,

the navigation services of high accuracy as well as Earth Observation program –which in the future will be frequently updated and provide accessible images delivered by COPERNICUS' new Sentinel satellites (they will cover a wide spectrum of radar, optical and infrared frequency images on resolutions around 10 m, worldwide)- will be free of charge. This lowers entry barriers for intelligent location-based services added on top of data users are eventually ready to pay for. At the same time it creates an abundance of opportunities for knowledge-based small and medium-sized enterprises and start-ups ready to design custom-made services on top of existing and well maintained infrastructures. These could be mobility infrastructures linked to public transport or publicly made available data of cities and regions, "big data", or like in the case of COPERNICUS satellite image data – on top of which services could be delivered anywhere and at any time via a (future) network of dense and fast mobile internet lines also in rural areas.

In order to bring Europe back on track in the field of mobile services the European Commission, Directorate-General Enterprise and Industry designed an own support program for this emerging industry, the European Mobile & Mobility Industries Alliance (EMMIA).

Essential elements of this support initiative EMMIA are the so-called Concrete Actions and more in particular the Large-Scale Demonstrators: "L-SD". These are projects which are aimed at solving a specific regional problem like e.g. lacking offers for "mobile" tourists in rural areas. A concept suggests then a solution, builds a prototype and then looks to convince other regions to invest in a solution, which already has proven successful. Therefore, L-SDs lower the entry barriers for new investors, in this case European regions engaged in tourism activities. There have been three waves of calls for large scale demonstrator projects, one linked to "space applications" in tourism, one on location-based services linked to mixed Galileo and COPERNICUS applications and one onto air-quality and intelligent transport systems based on COPERNICUS applications.

Below is a graphic of the different strands of the European Mobile & Mobility Industries Alliance, EMMIA.

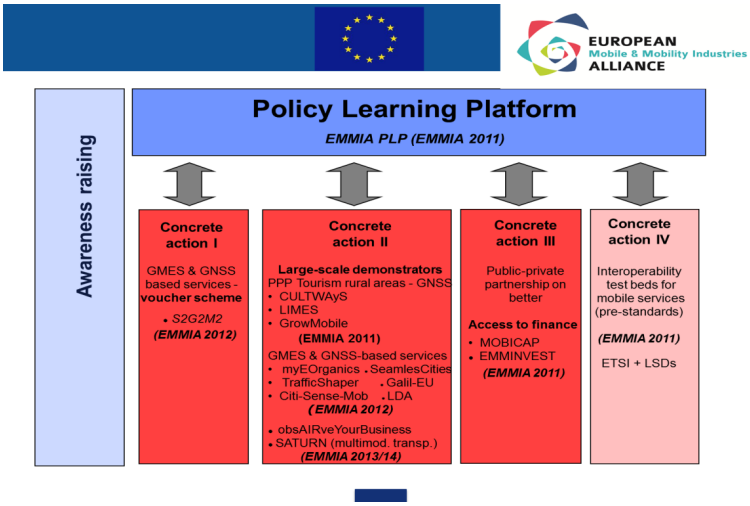

Figure 1. Graphics of the different support strands of the European Mobile & Mobility Industries Alliance (EMMIA) ordered according to dates of calls

There are also Concrete Actions focusing on the financing of mobile services, on voucher schemes for "mobile entrepreneurs" as well as on services linked to ETSI, the European Telecommunications Standards Institute, which holds essential standards like GSM and 4G.

Below, three L-SDs projects will be shortly introduced: obsAIRveYourBusiness, Traffic Shaper and myEOrganics.

The EMMIA Policy Learning Platform (EMMIA PLP) gathers inputs from the projects run within the EMMIA initiative and from its members. It also interacts with the involved agencies, like ESA and GSA, the European Space Agency in Paris and the European Global Navigation Satellite System Agency in Prague and the European Commission initiating and supporting this program.

European Mobile & Mobility Industries Alliance – The Policy Learning Platform

Methods

Designing policies on top of infrastructures, integrating potential solutions for barriers to overcome and lessons learnt from implementing concrete projects, like large-demonstrators, into future policies is what the EMMIA Policy Learning Platform of the European Mobile & Mobility Industries Alliance is about. This proved effective in previous regional innovation support programs like ProINNO and Europe INNOVA, also initiated by the European Commission's DG Enterprise and Industry.

The EMMIA PLP is run as an open innovation platform supplementing, improving and validating inputs and results gathered from European model regions in mobile services.

Below is a graph of the methodology developed by the platform to extract and validate policy recommendations.

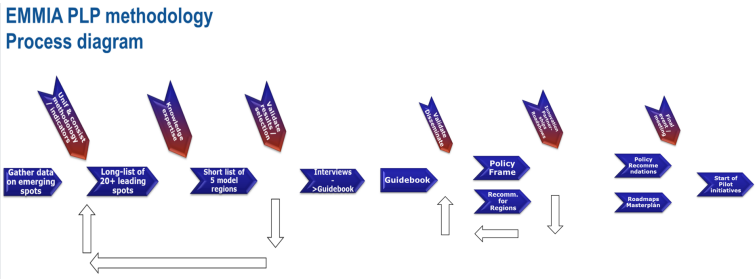

Figure 2. EMMIA PLP methodology developed to extract and validate policy recommendations for Europe' regions engaged in mobile services

Each time new information is extracted e.g. from interviews, from innovation partnerships, from roadshows, another validation step is done through a meeting and/or discussion with the experts directly or via a platform meeting. Loops in the process guarantee that feedback and comments are fed back and used to improve on the

quality of the outputs like policy recommendations or further new pilot initiatives.

More than hundred interviews of key stakeholders were done in order to learn on some of the policies Europe's mobile future might best be guided by. For this purpose start-up supporter, regional development agencies, entrepreneurs, company CEOs and program holders in five selected model cities/regions, namely Berlin, Barcelona, Estonia, London and Malmö were interviewed. In six interactive meetings the currently about 20 regional members of the PLP met and exchanged ideas and views from experiences gained out of a mix of concrete EMMIA actions - like large-scale demonstrators, finance and innovation vouchers programs, cluster support measures or individual programs – set-up to create intelligent jobs in the mobile industry. Some of the large-scale demonstrator initiatives within EMMIA are closer looked at below.

In order to make the recommendations more adapted to real life situations policy recommendations were sought to be extracted in order to deal with different target groups of regions. EMMIA PLP decided to make the recommendations specific to the maturity level of the support eco-system of the region: How well are mobile services supported in a region, what infrastructures are there to support such an industry. Are there sufficient fast mobile access lines covering the entire region? Are there mobile service industries, who are its actors and supporters? Are there test labs where to check on new devices or software? Are there social and professional networks allowing to address the right people for technical, funding or partner search aspects? Are there own support programs for start-ups in this sector? These are just a few criteria finding entry in putting different regions in different maturity grades for support of mobile industry.

Results/findings

Based on the above reasoning EMMIA PLP extracted and validated policy recommendations for three levels of maturity in regional support of mobile services: excellence, climbing and challenger level: Depending on the support eco-system for mobile services

present in a region different sets of recommendations were discussed together with the region. Here below is a sketch of examples of such recommendations.

Figure 3. EMMIA PLP policy recommendations according to three different maturity levels of a region in the support of mobile service

Usually a region approaches EMMIA PLP and asks, is it sufficient what we do, and what else could we do as a region in order to be part of today's mobile trend, in order to benefit from intelligent jobs in this emerging mobile service industry?

For this purpose the "EMMIA Policy Learning Platform Partnerships" were developed.

These are regions active or planning to invest in mobile services. They answered a Call for Expression of Interest to join EMMIA PLP in an assessment, recommendation and dissemination process. So each region went through a first joint workshop of local regional key stakeholders in mobile & mobility industry (supporters) assessing what the region offers, what are the infrastructures and networks present, who are the supporters, etc. In a second workshop EMMIA PLP experts gave their feedback and first recommendations. In a third public workshop under the presence of EMMIA PLP the region

makes suggestions to a wider audience telling about future plans and commitments to this industry.

The three partnerships actually concluded in 2014 were three regions at different maturity levels: excellence level, climbing and challenger level corresponding according to EMMIA PLP's opinion to the regions of Dublin/Cork in Ireland, to Luxembourg as a country and to Kyustendil, a region in the West of Bulgaria, respectively.

A second instrument developed, the EMMIA PLP Roadshows, are targeted to already existing conference schemes to host an EMMIA session, in order to convince target groups of regional stakeholders to engage in further investments in mobile services and technologies.

The recent findings are published in the Guide "mobilise europe" to be found on the initiative's website. The next updated version is expected in November 2014 shortly after the Rome event of EMMIA PLP on Fri., 21 Nov. 2014: http://www.mobilise-europe.mobi/emmia-final-event

Implications - example Ireland

How might the policy analysis developed in the Regions that EMMIA studied be transferred and used in other regions? EMMIA initiated a pilot exercise in form of the EMMIA PLP Innovation Partnership in Ireland that is still ongoing. Ireland is barely a qualifier for the leading regions of Europe in mobile and mobility applications, despite having started to spin out remote sensing companies in the mid-eighties, (ERA/Maptec). So six of those EMMIA recommendations for leading and for promising Regions that are considered relevant for further discussions do apply to policies and actions in Ireland; these are: secure access to capital, attract big brands, creating policies around the public sector, building access to knowledge, recognising the importance of indirect factors (such as emigration and immigration), building-up access to knowledge, are under scrutiny by interrogating a cadre of seasoned entrepreneurs, funders, technology researchers, and programme managers in Innovation, as well as new entrepreneurs in the mobility space. Consideration of these factors may be useful to entrepreneurs

operating under the implementation of the Irish Government's National Statement on Entrepreneurship in Ireland, 2014, as well as to other regions.

Conclusions

EMMIA PLP is an open platform. Regions are free to join and to take advantage of the experiences of the platform and the network of expertise, see the offers to join on www.mobilise-europe.eu. The platform is grateful for opportunities to discuss its findings and to host sessions on the lessons learned within EMMIA: all in all 15 private-public partnerships originated up to now from this initiative helping to push Europe's competitiveness in mobile services and mobility. The platform's service offer, the "EMMIA PLP Innovation Partnership", will continue to be offered by the EMMIA PLP partner www.ENCADRE.net.

European Mobile & Mobility Industries Alliance – obsAIRveYourBusiness

obsAIRveYourBusiness is set up within the EMMIA 2013 phase. Following the systemic approach of the large-scale demonstrator, as developed by the Enterprise and Industry Directorate of the European Commission, the overall objective of the obsAIRveYourBusiness project is the development and testing of a mobile application to forecast air quality in cities. The air quality service delivers near real-time information to mobile apps and builds on experiences from the obsAIRve project and the European Copernicus programme.

Up to now the selling of air quality data to cities has not been an easy job, which often failed. One reason was that the level of spatial resolution level of info made available was often insufficient for users. I.e., a citizen will only use such a service if the service tells the air quality (forecast) in the immediate surroundings, where (s)he lives and works. If this criterion is not fulfilled, the interest of potential user groups and the utility of the service provided lowers rapidly.

Innovation has always an entry barrier, this application is used to lower the barrier for cities and regions to join the air quality forecast partnership offered within obsAIRveYourBusiness. One part is a functioning prototype app on a smartphone, but equivalently important the actual process of matching a city's interests, capabilities and requirements with the capabilities of a modelling software, and the variety of city data available for principal integration of data into such prediction models is targeted. This interaction is closely watched by an innovation support agency, Airparif together with Paris Agglomeration (about 11.000.000 inhabitants), and DLR, Oberpfaffenhofen, together with the (smaller) City of Augsburg (about 300.000 inhabitants).

obsAIRveYourBusiness builds on the work and transfers knowledge of the experienced air quality control consortium members of obsAIRve initiative funded from November 2011 to October 2013 by the GMES/COPERNICUS Unit of DG ENTR. Technologically, the added value of obsAIRveYourBusiness is an increase of the resolution of the air quality modelling within certain selected cities and regions in Europe, with a resolution down to 1 km x 1 km. The air quality is described by the CAQI Index (Common Air Quality Index) including weights of the O3, PM10 aerosols and NO2 concentrations. Like for obsAIRve, satellite data from the Copernicus predecessors MACC II and Pasodoble enter the model simulations, which is replaced by more accurate Sentinel data.

In order to achieve this user-driven forecast accuracy, relevant input data referring to the selected and interesting areas of focus - cities and neighbouring regions – are integrated into the forecast models. This could be 3D contour data of buildings in a city or region. Bigger buildings and their constellations are known to influence the micro climates and especially air turbulence, thus influencing the spread of aerosols and gases. In parallel data on traffic flows or other regularly operating emission sources like e.g. chemical factories allow to increase the accuracy of the forecasts. These are only a two examples of possible data which might be delivered by cities and regional authorities and which will be scrutinized in a first round of meetings matching user requirements from the city sides and the capabilities of the forecast models ad provided by the consortium partners DLR and Airparif.

Cities have obligations to guarantee a certain air quality to their citizens. In times of transparency of public data those data will be made available right at the living and working environment of the citizens via a smartphone app. Data will be regularly updated showing, depending on the location of the citizens of the participating city or regions, the up- to-date air quality data. Time span of update and local accuracy depend on the data provided by the cities and regions.

The scientific quality of the service will be assessed continuously. Based on experiences gathered within previous air quality modelling projects such as Pasodoble and standards laid out in the international modelling community (e.g. through FAIRMODE), evaluation strategies common to all models within the project will be defined. In view of further extensions of the service this allows to set and document quality standards. Evaluation will be based on available data, especially station data as provided by the Copernicus in-situ component. Inclusion of satellite data into the quality control strategy will be foreseen as relevant data from Copernicus becomes available after the launch of the Sentinel-5 Precursor satellite. Example of a regional-scale air quality forecast (of NO_2 in this case) from Pasodoble using POLYPHEMUS/DLR. A graphical sketch of the obsAIRveYourBusiness principle is shown below in Figure 4.

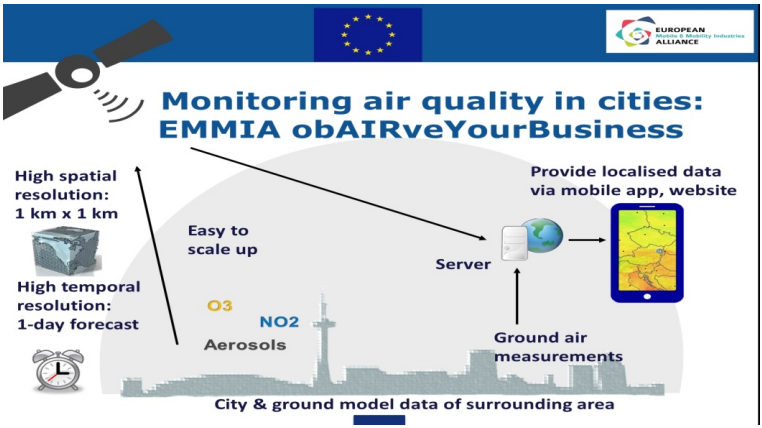

Figure 4. Sketch of EMMIA obsAIRveYourBusiness Large-scale Demonstrator using global navigation as well as COPERNICUS inputs

Beyond the target user group envisaged within the obsAIRveYourBusiness project - cities, regions and their citizens – potential is seen in using the processes optimised here to be used by weather services and health insurance companies focusing on respiratory diseases or more effective air pollution warnings in order to better serve e.g. allergy and asthma patients.

A user forum offers possibilities to link users and providers of health and environmental services based on GNSS, Copernicus and mobile internet. Based on results from the forums and feedback from stakeholders, policy recommendations are put together with the aim to allow scaling up of the obsAIRveYourBusiness service or similar services to European scale.

European Mobile & Mobility Industries Alliance – myEOrganics

The myEOrganics activity is part of the (European Mobile and Mobility Industries Alliance) EMMIA initiative. myEOrganics has been set up within the second phase of EMMIA and aims at developing a mobile service to support certifying bodies in attesting

organic farming. Within this framework, the technical implementation of the service and investigation in policy measures is performed, in order to support the related industry to exploit this new service on regional and European level. This will be achieved by the large scale demonstrator approach.

High-resolution earth observation satellite data are utilized to determine the organic rate of a field. Thus making the distinction between non-organically (i.e. commercial) and organically grown crop. With the help of geo-referencing, this data can be used in situ on a mobile application by certification personnel during their audits.

Furthermore myEOrganics serves as a blueprint for similar activities and supports the emerging industry linked to innovative mobile services for farming and possibly other areas like forest monitoring, agriculture insurance, etc.

The key objectives of the project are therefore:

- Demonstrate the potential of mobile technologies for organic certification.
- Highlight the potential for scalability and customization of the service.
- Identify and provide a stimulus to emerging industries with an innovative mobility concept in the area of agriculture and forestry.

The myEOrganics service also aims at bettering food security and optimizing the certification process of organic farming. With these objectives, the project also contributes to the societal challenges of sustainable agriculture, and supports EU's Common Agricultural Policy (CAP), see sketch of set-up in Figure 5.

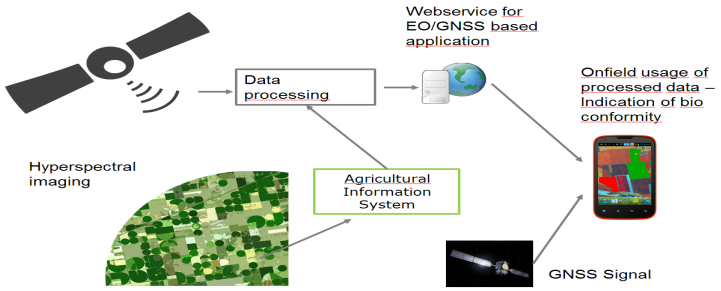

Figure 5. Sketch of EMMIA myEOrganics Large-scale Demonstrator using global navigation as well as COPERNICUS inputs

The technical part of myEOrganics is based on the R&D results gathered within the innovation study "EOrganic" funded by ESA. The hypothesis was, as organic and conventional crops are treated differently, their reflectance characteristics as observed by satellites are also different. Within EOrganic, satellite images were evaluated and it was determined whether it is possible to spot these differences and by this support the certification process. The concept was tested on winter wheat and corn grown during 2 vegetation periods and in 2 geographical regions. Several spectral indicators based on biophysical justification and crop management practices could be identified to differentiate between conventional and organic methods. Accuracy rates of 80% to 90% in discriminating organic from conventional fields were achieved.

Today, the certification industry sectors make a limited and superficial use of mobile technology and smartphone services, especially in the field of organic certification. The demonstrator is targeted to organic agriculture certification and addresses specific challenges in this field and provides a new innovative tool, making in-field inspections more efficient and effective. It offers incentives for developing, testing and implementing new approaches for organic certification.

Fields are physically visited during inspection prior to certification. Mobile technology enables the inspector during (or in preparation of) these visits to:

- Have an overview of the farmers' fields with different attributes based on discriminating EO indicators relevant for the certification schemes (organic, payment for environmental services, carbon compensation areas, etc.).
- Record the fields inspected with indications as to specific observations relevant for the control and/or certification schemes (transcript from voice recording, typed notes, photos for proof of conformity or non-conformity).

The integration of mobile technology will require a proper data base where:

- Farmers can feed in their fields online, either on an individual basis or in integrating existing geo-localisation of fields such as those available through farmers' coops and/or administrations.
- Confidentiality on one hand and the authorization to use existing field geo-localisation data bases on the other hand are well taken care of, given the existing legal framework on the protection of personal data.
- Data can be exchanged and/or transferred to other sets of data used in certification schemes such as E-Cert, a standard administration software used by certifiers.

The project highlights how successful service innovation especially in emerging markets can lead to new service sectors and industries; and therefore being a key example of economic growth. The project provides a range of information and services under the theme of organic agriculture and food safety highlighting the potential of mobile technologies for this area.

European Mobile & Mobility Industries Alliance – Traffic Shaper

The project as a whole shall demonstrate how GNSS and GMES technologies have the potential to meet real life transportation needs, leading to positive impacts in addressing smart, green and integrated road transport.

Specifically, the project aims at reducing traffic congestions using real time traffic data that will support the driver decisions in reaching its destination. The mobile application will support the drivers in choosing the best route of their destination elaborating alternative routes. The innovative element of the demonstrator relies in suggesting different alternative routes to the different online users.

Furthermore, there is significant potential for the Traffic Shaper to highlight the scope for evolution and emergence of new industries in the area of intelligent transport systems. A new generation of service industry utilising user-generated information will meet demanded service needs whilst having a positive impact on the logistics infrastructure of a town/city. In turn, the continued improvement to the infrastructure generates benefits both in terms of the environmental and economic impact. Therefore, the implementation will demonstrate the need, technical capabilities and impact of innovative mobile services based on GNSS, GMES and crowdsourced data to contribute to smart, green and integrated transport, in turn creating the ideal conditions for a new service industry to evolve. The following figure shows this process, detailing each stage and how the need is justified by the results.

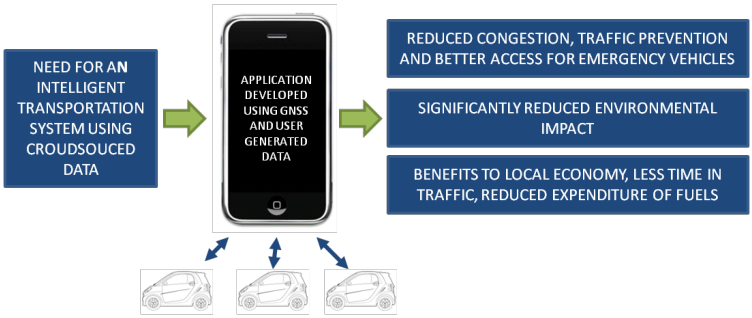

Figure 6. Process of supporting the emergence of new mobile technologies in a metropolitan area

The architecture of the traffic shaper system is reported in Figure 7. It is composed of: a back-end, which calculates and provides to the users the best path to reach a destination; and a front-end, used by the users to interact with the backend. In particular, two different frontends have been developed:

- The administration GUI, which is a web interface for the system administration purposes;
- The mobile app: a tool that permits the user to exploit the traffic shaper functionalities, by means of intelligent navigation feature.

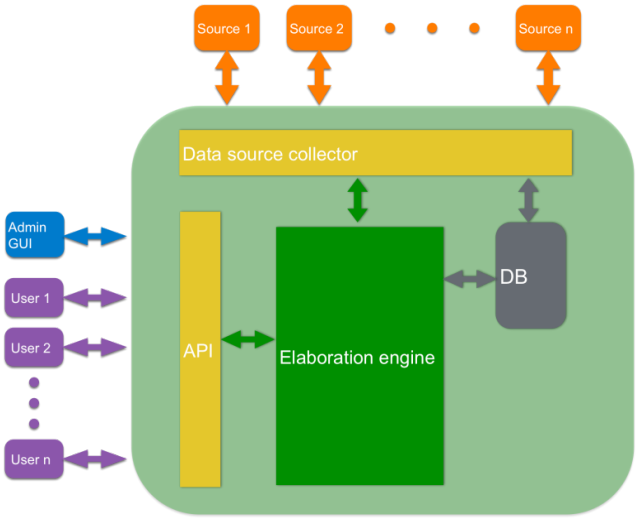

Figure 7. System architecture

The back-end system is the “brain” of the Traffic Shaper project and it is composed by: the “elaboration engine”, the database and the interfaces needed to interact with the external world, in particular with the users and the traffic data sources. The architecture depicted in Figure 7 is composed by the following modules:

- Data source collector elaborates the users requests collecting the necessary information for the system execution;
- Data source elaboration unit collects the traffic-road conditions data and it adapts them to our platform's format. The outcome the previous step is filtered and utilized as an input for the route elaboration engine;
- Elaboration engine takes as input the previous elaborated information (users routes, the traffic road condition) and it calculates the best route for each user;
- API permits to exchange data between the backend and the mobile app and the user administration GUI;
- Sources (1, n) are the data sources: as mentioned in this first phase we develop three different data sources: TomTom,

Twitter and GPS tracker. At the beginning of the second stage we will introduce a set of high-resolution atmospheric data set related to air quality.

The Mobile application is the final user tool that permits to discover all the traffic shaper features; in particular it is possible to request a path inserting a starting point and an arrival point. The implemented app is foreseen only for Android smartphone.

The app communicates with system back-end via RESTful API. In this first stage it is an alpha release and the features implemented are the following:

- User registration and authentication;
- Route selection: the user can request a specific route inserting the start point and the arrival point;
- Route visualization: once the user request a route, the application visualizes the backend response, i.e. the best calculated route, directly on screen as a red line on Google Maps;
- Reporting traffic condition: the user can also be “active”, helping to know where is a traffic congestion or an accident;
- User tracker: the app sends automatically information about user’s position to the backend. These features can be activated or deactivated by the user.

Figure 8. Mobile application

Acknowledgements

This work is partially supported by the European Union through the European Mobile & Mobility Industries Alliance within the Competitiveness and Innovation Programme (CIP) fostering small and medium-sized enterprises.

Índice

Servitization in Basque manufacturing firms: Applicability of literature conclusions and design of a new framework for decision making

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Abstract

Adding services to the product-based offer is one of the business development strategies that is gaining growing attention. Manufacturing firms are increasingly servitized in response to market factors, and research into the subject has intensified dramatically in the last decade (Baines & Lightfood, 2013).

This is also the case of the Basque Country, where both companies and government are increasingly discussing this issue; however knowledge is still limited. Business and government practitioners are familiar with just a small part of the servitization knowledge base and are far from where the research is produced and shared.

From our perspective of business strategy consultancy, we aim to provide new insights into servitization, under the following approach:

- Focus on summarizing existing knowledge from a practical point of view, more than creating new knowledge.
- Orientation to the industries and sort of companies which are more common in the Basque Country.

Main conclusions of our research are presented in this paper in nine key findings and two deliverables. Additional conclusions are available upon request.

The study is still in progress. Full results will be available in November.

Keywords: servitization strategy, servitization process, barriers to servitization, organizational transformation, Basque industry.

Theoretical framework

Two theoretical initial considerations have to be made.

First, a framework of six development paths has been used to understand the different directions that companies follow in servitization (see Figure 1). Every path groups together similar, or connected services, and differs from other paths in the key aspect of value proposition. While these six paths do not cover every single service offering in manufacturing, they do explain a high proportion of actual business practices.

Second, the research is based on the assumption that thinking and speaking specifically about servitization is correct and interesting for companies. We have observed that servitization can be considered a facet, or even a consequence, of other strategic decisions, such as commercial development, diversification, internationalization or vertical integration. Many business managers do not feel comfortable discussing servitization, even though their companies are developing services as an essential component of business strategy.

Based on the literature and our experience as consultants, we think that services play a relevant role in a manufacturing company since they may involve a change in the business model. This change in the business model is typically determined by one or more of the following factors: people, place and customization.

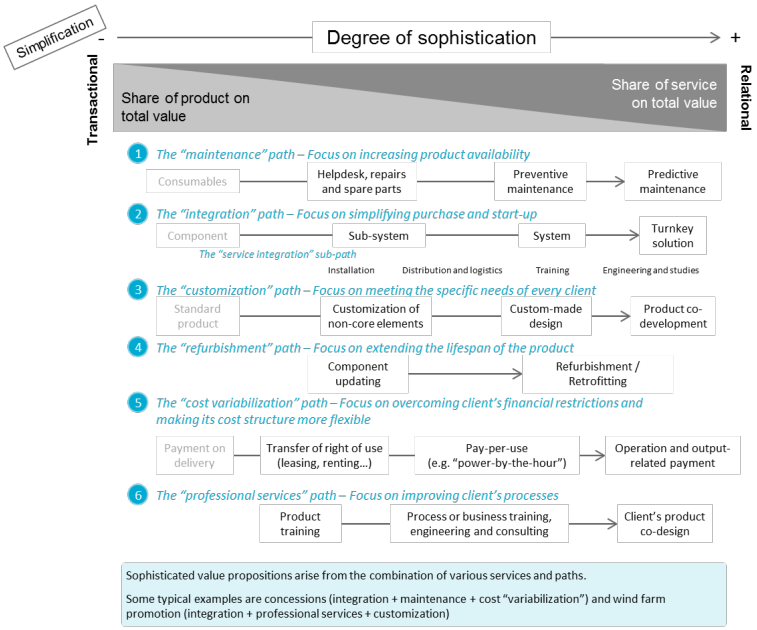

Figure 1. The six main development paths in servitization (B+I Strategy)

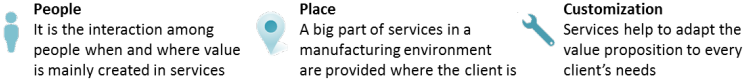

Figure 2. The three factors that characterize services in a manufacturing environment (B+I Strategy)

Methodology

The research study was structured into four working packages:

- Building a theoretical base. For this purpose, an in-depth literature review was conducted.
- Understanding the situation of Basque companies. This package comprises statistical analysis, exploitation of B+I's

knowledge derived from our experience advising manufacturing companies, interviews with a selection of companies and cluster associations, and a survey.

- Creating new insights, in conclusion to all of the above.
- Dissemination and discussion. Ongoing discussion with a B+I group of experienced consultants, review by experts in servitization and participation in conferences.

The main components of this methodology are described here.

Literature review

An in-depth literature review was conducted. The leading authors in the field, as shown in the references of this paper, have been taken into consideration.

Survey

In September 2014, an online questionnaire was sent to a database comprised of 250 Spanish manufacturing companies, with 47 valid responses from Basque manufacturing companies having been received to date.

In this paper we present the main conclusions, although further data exploitation is planned.

The profile of the sample is as follows:

Turnover (in € million):	
Group	**#**
< 20	14
20 - 50	10
50 - 100	11
100 - 500	9
> 500	3

Number of employees	
Group	**#**
0 - 49	7
50 - 99	6
100 - 249	15
250 - 499	5
> 500	14

Degree of internationalization	
Group	**#**
Sales concentrated on the Spanish market	8
Sales concentrated on the European market	9
Competes in the global market, but sales concentrated on a reduced number of countries	11
Competes in the global market, and sales are dispersed worldwide	19

Industry	
Group (more than one option is possible)	**#**
Metals	8
Automotive	12
Equipment for the energy industry (power grid, wind energy, oil&gas…)	9
Machinery	10
Other	38

Headquarters	
Group	**#**
Basque Country or Spain	43
Another country	4

Dissemination and discussion

Conclusions of our research are being validated from different perspectives:

- First, discussion with the B+I team of consultants, who contributed their knowledge after several years in strategy consultancy. This was a critical step to validating the conclusions of literature analysis and its usefulness for decision-making in companies.
- Second, review by experts in servitization. We plan to have this paper reviewed by several experts in the field in the coming weeks.
- Third, discussion with companies and cluster associations. This task is ongoing at present.
- Fourth, participation in conferences. In September Igor Revilla took part in the 7th International Service Operations Management Forum in Tilburg (the Netherlands); in November the conclusions of our research will be presented in the International Conference on Business Servitization in Bilbao (Spain); and in 2015 we plan to take part in the 35th SMS Annual International Conference.

Profile of the Basque manufacturing industry

A brief characterization of the Basque manufacturing industry is needed to properly understand some findings that are presented below. We have found four key characteristics of our industry that must be taken into consideration in any discussion around servitization: firm size; industrial specialization (clusters); position in the value chain; and competitive strategy rationale.

According to Confebask (2014), based on statitics by Eurostat and Eustat, big companies account for 0.7% of total number of manufacturing firms in the Basque Country, which is similar to the weight of this segment in the euro area (0.7%), and lower than in Germany (1.9%). What is more relevant is that the average size of that group of big companies is smaller in the Basque Country than in

other reference regions, including Germany, France, Spain and the whole Eurozone. In conclusion, small size is characteristic of the Basque manufacturing industry.

Theses statistics are supported by our knowledge of Basque companies and their markets. Companies headquartered in the Basque Country are smaller than the leaders in the markets where they compete. This is true for some of the biggest manufacturing companies in our region, such as CAF, and especially applicable to the next group of companies that compete in the global market with a turnover around, or below € 500 M.

Regarding industrial specialization, Figure 3 shows that main manufacturing clusters in in the Basque Country in terms of exports are: metals; automotive; manufacturing technologies (which includes machine tools); and heavy machinery (mainly rail rolling stock). Other relevant clusters in the Basque Country, not properly reflected in this chart, are aerospace and equipment for the energy sector. Basque manufacturing industry shows a relative specialization in capital goods, where servitization principles are applicable to a large extent.

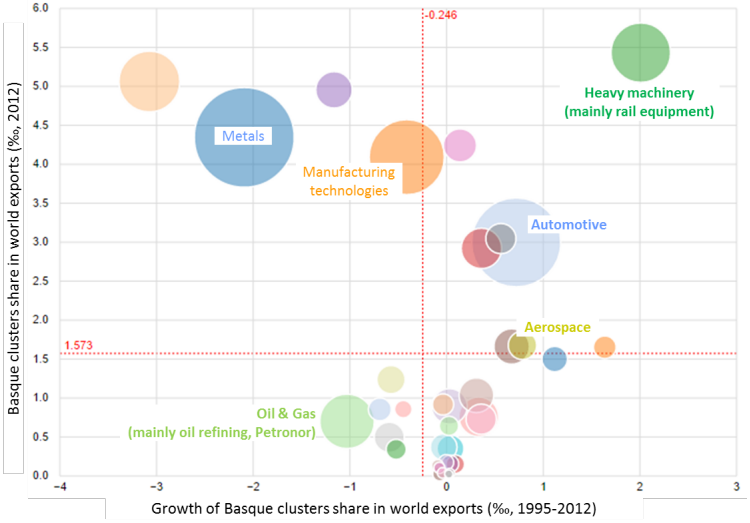

Figure 3. Industry clusters in the Basque Country (Orkestra)

Another distinctive feature of the Basque manufacturing industry is that many companies do not have a direct link to the owner or user of the product manufactured, because they act as component suppliers of OEM or sell through integrators or distributors. This position in the value chain is correlated with firm size and industrial specialization, and determines the potential and form of servitization to a large extent. The Basque automotive component industry is a paradigmatic example, because some key services such as maintenance and integration are delivered by OEM or big tier 1.

This idea is illustrated in Figure 4 and supported by our survey to Basque manufacturing companies. 40% of respondents declare that they sell exclusively or mainly through distributors, integrators, or assemblers, while only 19% sell mainly to the owner or the end user of the product.

Among the most competitive Basque industry clusters, only machine tool and rail industries are close to the owner or user of the product sold.

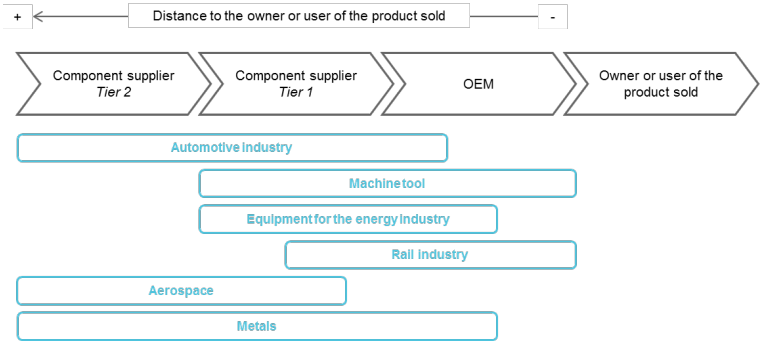

Figure 4. Position in the value chain of main Basque manufacturing clusters (B+I Strategy)

Finally, competitive strategy rationale conditions the servitization strategy of Basque companies. B+I Strategy has observed that product customization and flexibility to adapt to client's needs is very often used as the main argument to differentiate from market

technology leaders and low cost competitors. On the one hand, customization requires greater focus on the client by every department (sales, engineering, production…), so from this point of view many Basque companies have already changed their mindset and are no longer exclusively product organizations. On the other hand, high levels of adaptation to the client make it difficult to offer new services proactively, and even to get paid for them.

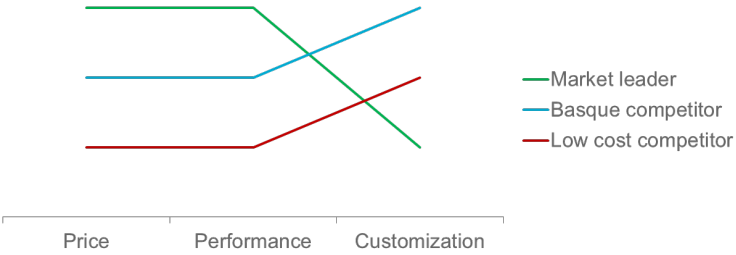

Figure 5. Competitive strategy based on customization (simplification) (B+I Strategy)

Results/Findings

For each research finding, conclusions are first presented, and then the evidence that support such conclusions coming both from literature and our observations in Basque companies.

Finding 1. Servitization is an important issue for Basque manufacturing firms, but not for all of them.

Manufacturing firms are increasingly servitized, according to the literature and available statistics. Experts predict that this trend will continue in the future, as drivers of servitization are still gaining strength.

The trend is more intense in industrialized economies, where companies face strong pressure to move towards high value-added activities.

Statistics do not provide a precise picture of servitization in the Basque Country, but from our survey we can conclude that: a) services will be more relevant in what firms offer than they are now; b) while many companies are thinking and talking about servitization, many others are not; and c) a significant proportion of Basque manufacturing companies still consider themselves a 'product company'.

Literature review
- 60% of British manufacturing firms surveyed reported revenue growth from 2006 to 2011 derived from servitization. (Barclays Corporate and Cambridge Service Alliance, 2011). - Share of service-related jobs in the manufacturing sector has increased in the period 2008-2012 from 36% to 42% in the UE and from 32% to 38% in Spain. (Veugelers, 2013). - Share of services in sales in Basque manufacturing firms increased from 0.8% in 1995 to 1.1% in 2007, according to official statistics. (Ruiz de Olano, 2010).

Our observations in Basque manufacturing firms
- 75% of respondents agree fully or to some extent with the statement: *"In the future, services will be more relevant in our offer than they are now."* - 62% of respondents agree fully or to some extent with the statement: "*The need to develop our service offer to enhance our competitiveness is under discussion in our organization."* - 30% of respondents state that their company is clearly a 'product company' and 47% 'a product company that adds services to its offer', while 19% position themselves closer to a 'service company."

Finding 2. Development paths are limited by its nature, as opposed to other strategies.

Unlike other strategic alternatives such as diversification or internationalization, servitization strategies are limited to a small number of development paths. The six development paths described above explain a high proportion of actual business practices.

The paths that we have labelled as 'maintenance', 'integration', 'customization' and 'professional services' are quite common among Basque firms, while 'refurbishment' and 'cost variabilization' and are only present in 30% and 11% of the companies surveyed respectively.

It must also be highlighted that companies surveyed display a service portfolio with a low to medium level of sophistication. In the integration path, on the other hand, 36% of companies reach what we consider a high level of sophistication (turnkey solutions).

Literature review
- Most common services in manufacturing firms over 100 employees-worldwide (offered by at least 10% of firms) are: design and development (22%), systems and solutions (16%), retail and distribution (12%), and maintenance and support (12%). (Neely, 2008). - Most common services in a sample of 200 British manufacturing firms (offered by at least 30% of firms): maintenance/repairs (70%), spare parts (53%), training/helpdesk (51%), and upgrades (41%). (Barclays Corporate and Cambridge Service Alliance, 2011).

Our observations in Basque manufacturing firms
- Percentages of respondents that have initiated each one of the six development paths: o Maintenance: 66% o Integration: 79% o Customization: 77% o Refurbishment / Retrofitting: 30% o Cost variabilization: 11% o Professional services: 68% - Out of these six development paths, no other service is relevant in the offering of companies surveyed. The most mentioned ones are warranties and financing, which can be considered as part of some of the six paths. - In general, companies surveyed show a service portfolio with a low to medium level of sophistication. In the integration path, on the other hand, 36% of companies reach a high level of sophistication (turnkey solutions). - Average scores of responses to "How broad / good (quality) / innovative is your service offering in relation to your competitors?" (*Scale: 1-clearly less; to 5-clearly more)* o Broad: 3.15 o Good (quality): 3.49 o Innovative: 3.17

Finding 3. Most Basque firms initiated the servitization process with the aim of supporting the product business, but the purpose evolved and now the goal of developing a new business line is also important.

In order to simplify, servitization pursues two overarching goals: 1) supporting the product business; and 2) developing a new business. Although servitization strategies usually bring both objectives together, firms concentrate on one or the other depending on the moment and circumstances.

An in-depth analysis of more specific objectives, as well as understanding the degree of proactivity in the servitization process, shows greater differences among companies. These specific objectives determine the servitization strategy to a large extent.

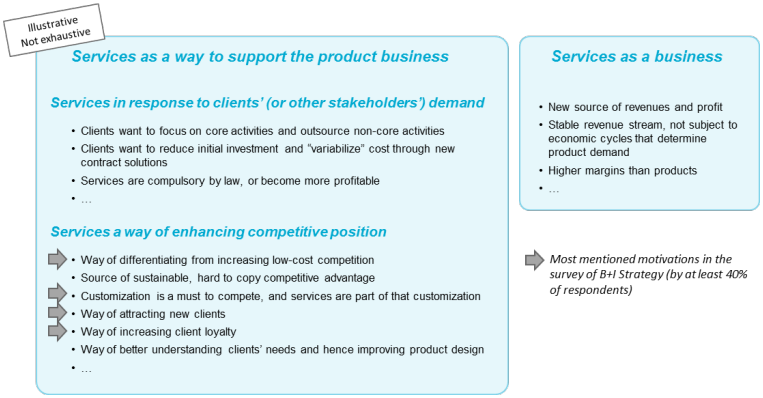

Figure 6. Servitization goals (B+I Strategy based on literature)

Literature review
- A broad spectrum of motivations and objectives for servitization strategy can be found for instance in (Baines & Lightfoot, 2013; Neely, 2008; Veugelers, 2013). - In research conducted with British companies, defensive motivations for servitization tended to be identified as more significant than the offensive motivations. However, further analysis showed that firms tended to provide services for a mix of offensive and defensive reasons. (Tether & Bascavusoglu-Moreau, 2012).

Our observations in Basque manufacturing firms
- "When your company started to develop the service offer, to which extent was the strategy focused on supporting the product business?" 61% of respondents state that the main goal was to support the product business. - "And currently? Has the approach evolved?" The percentage shown above drops to 43%, while 30% state that the strategy is simultaneously focused on both goals. - Among the specific objectives that servitization strategies can pursue, five are mentioned by at least 40% of respondents: o A means of differentiating from increasing low-cost competition; o A means of increasing client loyalty; o Customization is a must to compete, and services are part of that customization; o A means of attracting new clients.

Finding 4. Although servitization strategies often fail in terms of economic performance, the impact on competitiveness should never be underestimated.

Servitization does not always lead to value creation. In fact, some researchers argue that is not the case for most companies, and in our survey only 40% of firms declare they are satisfied with the impact of servitization on economic performance.

What can be easily observed in most companies developing the service offering is the improvement of several competitiveness factors. The following are the intangible benefits of servitization most mentioned in our survey:

- Brand image improvement;
- Improved client orientation of the whole organization;
- Client satisfaction.

In putting all the ideas presented together, new questions arise: Why is competitiveness enhancement not having an impact on economic performance? Will it in the future? Or, is it helping to keep profits stable in this negative economic environment, although companies are not aware of it?

Literature review
- Services are positively associated with exports. (Lodefalk, 2012). - "Simply, for most companies, the pain has not been worth the gain." (Krishnamurthy, Johansson & Schlissberg, 2003). - Only 21% of the firms responding reported success, in terms of revenue growth, profit margins, stock performance, etc. (Baveja, Gilbert & Ledingham, 2004). - Some literature suggests that servitized manufacturing firms achieve lower margins than pure manufacturing firms (Anderson et al., 1997; Grönroos & Ojasalo, 2004; Neely, 2008, Turunen & Neely, 2012). - The most ambitious service strategies are the ones that provide manufacturing companies with the greatest benefits, but they are also the riskiest because of costs associated with implementation. (Mathieu, 2001). - It is likely more a question of execution of a servitization strategy (how well the company builds the right organizational capabilities and culture), rather than the act of servitizing, that leads to improved financial performance. (Neely, Beneditinni & Visnjic, 2011). - Regarding the impact that servitization has on competitiveness, see (Hanski, Kunttu, Räikönen & Reunanen; Neely, 2013; Reichheld, 1996).

Our observations in Basque manufacturing firms
- Level of satisfaction with the impact of servitization on the firm's performance and competitiveness. Average scores on a scale of 1-5: 1-no satisfied at all; 5-very satisfied: o Impact on economic performance: 3.3 o Impact on client satisfaction: 3.7 o Impact on orientation to client of the whole organization: 3.8 o Driver for innovation and business model review: 3.0 o Hard-to-copy competitive advantage: 3.0 o Product design improvement thanks to better feedback from the client: 3.4 o Impact on brand image: 3.9 o Development of advanced knowledge of the industry: 3.3

Finding 5. Both servitization strategy, and the likelihood of its success, are conditioned by several factors, and the knowledge of what those influencing factors are, and how they exert that influence, is growing. In the Basque Country, relevant factors seem to be: firm size; industrial specialization; position in the value chain of our companies; and their competitive strategy rationale.

The degree of servitization is determined to some extent by:

- The sector where the company operates. The level of servitization varies a lot among industries, but no clear patterns can be concluded from the literature. Some researchers (Oliva & Kallenberg, 2003) suggest that mature industries in terms of growth and technological innovation, such as machine manufacturing, seem to show a greater propensity to servitization.
- The technology level of the company. In general, the service offering of high-tech firms is broader and more innovative, and contribute a higher proportion of total revenues.

And apparently servitization is more likely to boost profits in the following situations:

- Once the company reaches a critical mass of service sales (around 20-30%, according to some researchers).
- When services are strongly connected with the core activities of the product business.
- In small firms.
- When it is dealt with proactively.

It is important to note that, according to Fang, Palmatier and Steenkamp (2008), that the correlation between the availability of resources and value generation in a servitization strategy is just slightly positive. However, from our experience working with manufacturing companies, we have observed that the investment and time required to create an international service network is a huge barrier for Basque manufacturing companies seeking to servitize. In our survey, this barrier is mentioned by 40% of respondents as one of the five most relevant barriers to servitization.

Literature review
- The level of servitization varies widely among industries, but no clear patterns can be concluded from the literature. (See Lodefalk, 2010; Santamaría, Nieto & Miles, 2012; UK Engineering Employers Federation, 2009). - Mature industries in terms of growth and technological innovation, such as machine manufacturing, seem to show higher propensity to servitization. (Oliva & Kallenberg, 2003). - In general, the service offering of high-tech firms is broader and more innovative, and contribute a higher proportion of total revenues. (Kirner, Lay & Kinkel, 2008). - In Spain, both low-tech and high-tech firms tend to be more innovative in their service offering than medium-tech firms. (Santamaría, Nieto & Miles, 2012).

- The impact of a servitization strategy on firm value (as measured by Tobin's q) remains relatively flat, or slightly negative, until the firm reaches a critical mass of service sales (20%–30%), after which it has an increasingly positive effect. (Lodefalk, 2010).

- Service transition strategies are more effective at enhancing value when the service offerings are related more to the firm's core business and when firms have more available resources (i.e., resource slack). (Fang, Palmatier & Steenkamp, 2008).

- The impact of adding services to core products on the firm value amplifies as industry turbulence increases, but diminishes when the firm's core products are in high-growth industries. (Fang, Palmatier & Steenkamp, 2008).

- Those firms which had servitized by offering additional services which were not closely related to their core offering were those which had subsequently gone out of business. (Benedittini & Neely, 2010).

- In smaller firms, servitization appears to pay off, while in larger firms it proves more problematic. (Neely, 2008).

Our observations in Basque manufacturing firms

- In our survey smaller companies tend to face higher difficulties at creating an international network than bigger ones, but the correlation is low.

- In our survey 43% of respondents state that they sell exclusively or mainly through distributors, integrators, or assemblers, while only 14% sell mainly to the owner or user of the product.

- *Further data exploitation is planned in order to discover new relationships within the company profile, its servitization strategy and degree of success.*

Finding 6. Manufacturing firms worldwide face similar challenges in their servitization processes. Organizational and cultural issues are critical.

In spite of the huge potential of services, the development in many manufacturing companies is low, or the process is turning out to be slower than expected. Does this mean that servitization is more complex than other strategic development activities? Not according to Moscoso & Lago (2008) who argue that the failure rate in servitization is similar to those which can be found in other strategic options such as developing a new product, or entering a new market.

The following are the most common barriers and mistakes in servitization processes, grouped by their nature. The most mentioned barriers in our survey (with at least 10% of respondents) are highlighted.

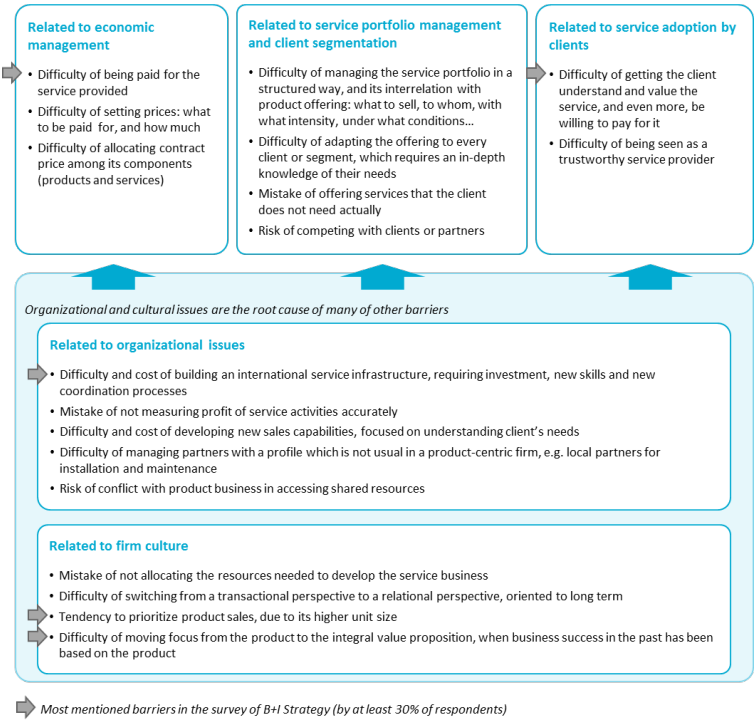

Figure 7. Common barriers and mistakes in servitization (B+I strategy based on literature)

Literature review
- A broad spectrum of barriers to servitization can be found in Hou & Neely, 2013; Kinnunen (2011); Aurich & Öhman (2012); Ritzen et. al (2002); Brax (2005); Mont (2001); Wong (2004); Martinez et. al (2010); Oliva & Kallenberg (2003); and Gebauer et. al (2009).

Our observations in Basque manufacturing firms
- The following are the most mentioned barriers in our survey (with at least 30% of respondents): o It is hard to be paid for the service provided; o The client does not understand the value of the service and shows little propensity to pay; o Creating the required international structure is costly and difficult to manage; o We tend to prioritize the product business; o We tend to focus the value rationale on the product instead of the offering as a whole.

Finding 7. Successful servitization strategies are based on a proper understanding of clients' needs and segmentation, so a special effort is required in Basque companies

Client segmentation, which is important for any value proposition, becomes crucial when the component of service is at the core of the offering. This conclusion of the literature is especially relevant for Basque manufacturing firms, who in our experience, do not generally have sound practices of client research and understanding. One of the reasons for this is their position in the value chain, as described earlier in this paper, but also the role of 'follower' that many of our companies adopt in their competitive strategy.

Literature review
- To a great degree, success in delivering solutions depends on the ability to adopt customer-centric organization principles. Customer segmentation is one of them. (Galbraith, 2002). - Client segmentation is an important element of the service logic business model. (Viljakainen, Toivonen & Aikala, 2013).

Our observations in Basque manufacturing firms
- B+I team has observed that knowledge of clients' needs and understanding of their behaviour is not a strength of Basque manufacturing companies. One reason for this is their position in the value chain, as described earlier in this paper, but also the role of 'follower' that many of our companies adopt in their competitive strategy. - Among the companies surveyed, those that tend to better adapt the offering to each client or segment are those that: o Have a specialized organizational service unit; o Consider that services are a core part of their business.

Finding 8. The organizational transformation required by the servitization strategy is a problematic issue for every manufacturing firm. Creating a service business unit is a usual recommendation, but the most appropriate solution for any specific company depends on multiple factors.

For every manufacturing company, or at least for a vast majority of them, servitization adds managerial complexity. There are three reasons behind this:

- Service activity in manufacturing firms is complex by its nature;
- When compared to product business models, service business models are very different making the combination complex to manage;

- This mix of product and service businesses in the same organization is even more complex when the service activity is exploratory (and this is the case for most servitizing companies), and hence has to coexist with the traditional exploitative business of product.

In order to begin to tackle this complexity, the organization has to be adapted by answering the following questions:

- Should we create a new business unit (profit centre) specialized in services? In general, the literature suggests doing so as a solution to avoid the natural tendency to sell products to the detriment of services, and at the same time reduce the complexity derived from managing two different businesses jointly. In contrast to this general opinion, Kowalkowski, Witell and Gustafsson (2012) argue that SMEs (with fewer than 250 employees) probably lack the critical mass that a service business requires. In addition, a separate service organization adds complexity and creates higher coordination costs and limits flexibility. In our survey, half the companies have a service unit, and in general these firms are more satisfied with the results of the servitization strategy.

- What sort of organization is more appropriate for services? Some researchers recommend initially adopting an organic structure aimed at fostering innovation while allowing agility, and later evolve to a mechanistic structure. Avoiding pure models is also a general recommendation in order to reduce potential conflicts between traditional (product) and new (service) organizations.

- Which new capabilities should we develop? Service businesses require some competences that are very different to the traditional competences in manufacturing companies. The most important capabilities according to our survey are: client relationship capabilities; the ability to detect new business opportunities; and the knowledge of client's business and processes.

- Which coordination tools are needed to coordinate service and product businesses? Some of the tools extracted from the literature are analytics (P&L account with different perspectives); integral planning of product and service portfolio; performance indicators and aligned incentives; process of assembly and disassembly of teams; and criteria for price distribution among units involved in contract fulfilment. Our survey shows that the average level of satisfaction among Basque companies with existing coordination tools is neutral (neither positive nor negative).

Literature review
- Manufacturing firms deal with relevant complexity in their services. Service delivery issues that require the development of new and service-specific skills appear to be particularly important sources of complexity. Complexity appears to be a characteristic of the services offered, rather than a consequence of the different approaches to complexity that may be taken by individual firms. (Benedittini & Neely, 2012). - Service and product business differ greatly from one another. While production units can perform as 'closed systems', service units need to be more open and flexible. (Turunen & Neely, 2012). - A great cultural gap exists between a product-centric business and a service-centric business. That is the reason why the organizational transition in a servitizing firm is so complex. (Galbraith, 2002; Kinnunen, 2011). - Regarding the recommendation of creating service business unit, see (Turunen & Neely, 2012; Oliva & Kallenberg, 2003). - SMEs (with fewer than 250 employees) probably lack the critical mass that a service business requires. In addition, a separate service organization adds complexity and creates higher coordination costs and limits flexibility. (Kowalkowski, Witell & Gustafsson, 2012).

Our observations in Basque manufacturing firms
- 49% of companies surveyed have a service unit in their organization, and in 70% this unit participates in the steering committee. - Companies with a service unit tend to: o Better adapt the service offering to every client or segment; o Be more satisfied with the results of the servitization strategy. - Among the capabilities needed to support the servitization strategy, the following are those most mentioned in our survey (with at least 40% of respondents) : o Client relationship capabilities; o The ability to detect new business opportunities; o The client's business knowledge; o The client's processes in-depth knowledge. - The degree of agreement with some questions regarding coordination tools. *Average scores of responses (on a scale of 1-5: 1-strongly disagree; 5-strongly agree):* o Our accounting systems show a clear and full vision of services in our business, in terms of revenues, cost and profit: 3.2 o We do an integral and coordinated planning of product and service portfolio: 3.4 o Product units have the required incentives to support the service business: 2.8

Finding 9. It is recommended to manage servitization as a gradual process, moving from known activities to new activities that are relatively close.

Sudden 'jumps' to unknown activities just slightly connected to known activities are a common reason for failure in servitization, as well as initiating development in different paths or dimensions at the same time.

Nevertheless, according to our survey this is not a common problem among Basque companies. Only 10% of respondents state that "We

have tried to move forward too quickly, jumping to services just slightly connected to our core activities or facing several development paths at the same time."

For example, in capital equipment manufacturing the first natural step is to develop a basic service offering for the installed product base, then spread it out to all the clients of the company, and finally expand the offering with advanced services.

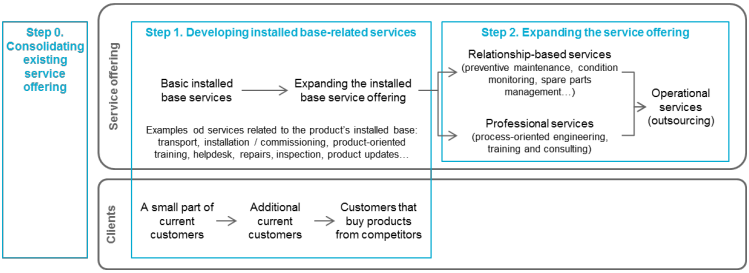

Figure 8. Standard servitization process in a capital equipment manufacturer (B+I Strategy based on Oliva & Kallenberg (2003); Reinartz & Ulaga (2008) and Kastalli, Van Looy y Neely (2013))

Literature review
- See Oliva & Kallenberg, 2003; Reinartz & Ulaga, 2008; Visnjic, Van Looy & Neely, 2013).

Our observations in Basque manufacturing firms
- Only 10% of respondents state that "We have tried to move forward too quickly, jumping to services just slightly connected to our core activities or facing several development paths at the same time".

Deliverable 1. A new framework for strategic decision making.

Based on the conclusions of our research, we have designed a new framework for strategic decision making in servitization especially intended for the sort of manufacturing companies that are most common in the Basque Country, i.e. internationalized, medium-sized (with of turnover of up to several hundred million Euros) and not necessarily with a close relationship with the owner of the product.

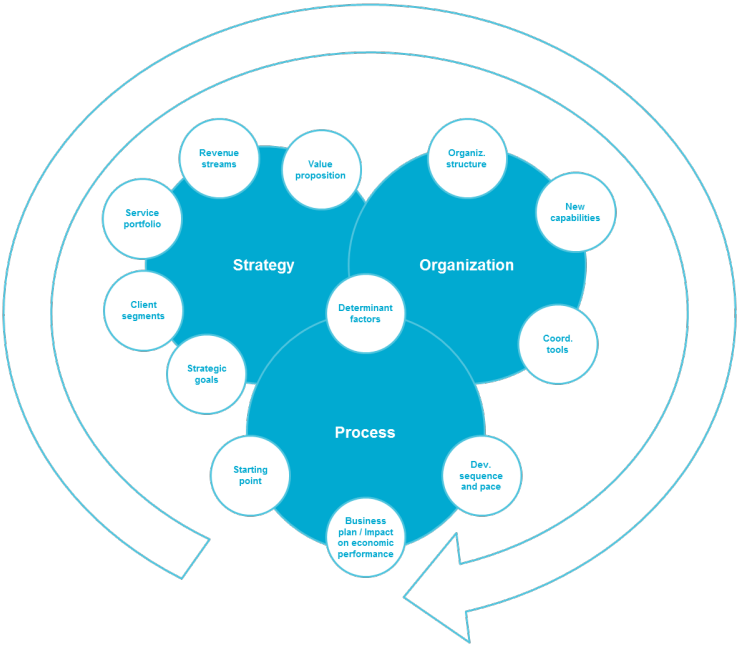

Figure 9. B+I framework for strategic decision making in servitization (B+I Strategy)

The framework has some characteristics that are relevant for manufacturing companies:

- It is rigorous and accurate. Its design is based on a research project which was conducted expressly for this purpose while combining it with an in-depth literature review, as

well as a survey of manufacturing companies. We also contribute our experience in providing support to manufacturing companies in their strategic thinking processes, along with an ongoing discussion to determine the critical questions for decision-making and find alternative answers to those questions.

- It is useful. From existing frameworks and recommendations, which in many cases are based on the study of big MNCs, we have extracted all the lessons learned that are more suitable for Basque manufacturing companies, and for all the companies that share the profile described. Based on our experience working with this type of firms, the framework highlights, for instance, client segmentation and a comprehensive vision of the value proposition.
- It is comprehensive. It considers the three dimensions, or perspectives, of servitization: strategy, organization and process. Organizational issues gain relevance because it is precisely where many servitization strategies fail.

B+I framework goes through every relevant question that a servitizing company must think about, as described below:

Figure 10. Key questions addressed in the framework (B+I Strategy)

Deliverable 2. Some practical recommendations.

As a complement to the framework, we make the following recommendations to manufacturing firms:

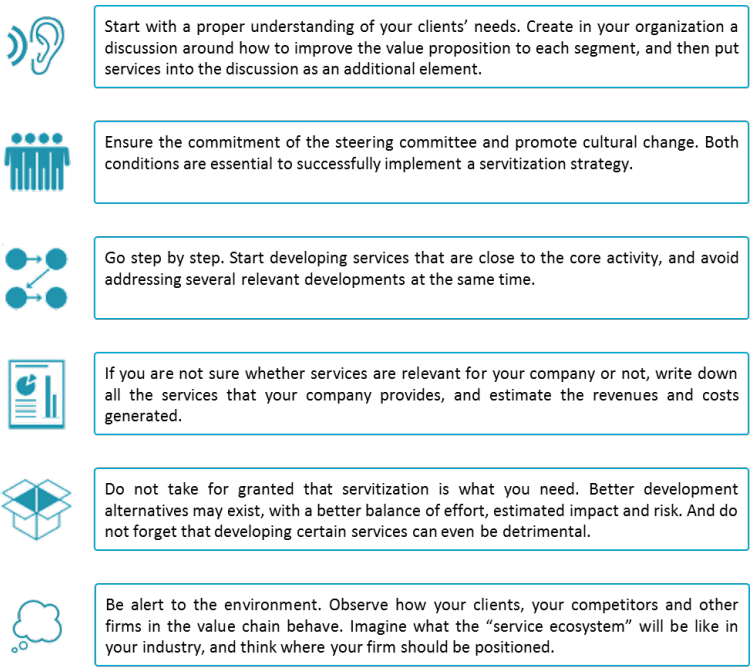

Figure 11. Practical recommendations (B+I Strategy)

Implications

Our research provides Basque manufacturing firms with new insights for decision-making regarding servitization.

Basque institutions will also benefit from this research. It will help them to understand the challenges that companies are facing.

Finally, our research shows that correct understanding of local clusters and the profile of companies (not adequately shown by

official statistics) is needed before applying general conclusions to any specific region.

References

Baines, T., & Lightfoot, H. (2013). *Made to serve – How manufacturers can compete through servitization and product-service systems*. John Wiley & Sons. UK.

Barclays Corporate and Cambridge Service Alliance (2011). *Servitisation and the future of manufacturing*. Report released by Barclays Plc, in association with the Cambridge Service Alliance.

Baveja, S.S., Gilbert, J. & Ledingham, D. (2004). From products to services: why it's not so simple. *Harvard Management Update,* 9(4), 3-6.

Benedettini, O., & Neely, A. (2010). Why do servitized firms fail. *In 17th International Annual EurOMA Conference–Managing Operations in Service Economies*. Porto. Portugal. 6-9 June.

Benedettini, O., & Neely, A. (2012). Factors Influencing Service Complexity: The Perspective of Servitized Manufacturers. *Paper presented at the EurOMA Conference 2012*. Cambridge Service Alliance 2012.

Confebask (2014). *Razones para una política de fomento del tamaño empresarial en Euskadi*. Study for the Basque Government. May 2014.

Fang, E., Palmatier, R.W., och Steenkamp, & J-BEM. (2008). Effect of service transition strategies on firm value. *Journal of Marketing,* 72(4), 1-14. http://dx.doi.org/10.1509/jmkg.72.5.1

Galbraith, J.R. (2002). *Organizing to Deliver Solutions*. Organizational Dynamics. May. http://dx.doi.org/10.1016/S0090-2616(02)00101-8

Hanski, J., Kunttu, S., Räikönen, M., & Reunanen, M. *Development of knowledge-intensive product-service systems*. Outcomes from the Maintenance KIBS project.

Hou, J., & Neely, A. (2013). *Barriers of servitization: Results of a systematic literature review*. Cambridge: University of Cambridge, Cambridge Service Alliance.

Kinnunen, R-E. (2011). *Servitization of Manufacturing Companies – Framework for Analyzing Servitization Capabilities*. Master Thesis, Department of Information and Service Economy, School of Economics, Aalto University

Kirner, E., Lay, G., & Kinkel, S. (2008). The relevance of services for high-, medium- and low-tech firms – an empirical analysis in German industry. In Hirsch-Kreinsen, H. & Jacobson, D. Eds. (2008). *Industrial Dynamics, Entrepreneurship and Innovation.* Edward Elgar, Cheltenham. UK. pp. 175-198

Kowalkowski, C., Witell, L., & Gustafsson, A. (2012). Any Way Goes: Identifying Value Constellations for Service Infusion in SMEs. *Industrial Marketing Management*.

Krishnamurthy, C., Johansson, J.E., & Schlissberg, H. (2003). *Solutions Selling - Is the pain worth the gain?* In McKinsey & Company. Ed. (2003). Marketing & Sales Practice.

Lodefalk, M. (2010). *Servicification of European manufacturing - Evidence from Swedish micro level data*. Örebro University. Swedish Business School working paper. 3.

Lodefalk, M. (2012). *The role of services for manufacturing firm exports*. Örebro University, manuscript.

Mathieu, V. (2001). Service strategies within the manufacturing sector: benefits, costs and partnership. *International Journal of Service Industry Management,* 12(5), 451-475. http://dx.doi.org/10.1108/EUM0000000006093

Moscoso, P., & Lago, A. (2008). La expansión de productos a servicios, un movimiento estratégico obligado pero con riesgos. *Harvard Deusto Business Review,* 166, 34-43.

Neely, A. (2008). Exploring the financial consequences of the servitization of manufacturing. *Operations Management Research,* 1(2), 103-118. http://dx.doi.org/10.1007/s12063-009-0015-5

Neely, A. (2013). *Why Servitize: Alternative Rationales*. http://andyneely.blogspot.com.au/search?updated-min=2013-01-01T00:00:00-08:00&updated-max=2014-01-01T00:00:00-08:00&max-results=3. Accessed: Tuesday, 5 March 2013.

Neely, A., Beneditinni, O., & Visnjic, I. (2011). The servitization of manufacturing: Further evidence. *Academic paper presented at the 18th European Operations Management Association Conference*, Cambridge, July 2011.

Neely, A., Mcfarlane, D., & Visnjic, I. (2011). Complex service systems – Identifying drivers, characteristics and success factors. *In 18th European Operations Management Association Conference*. Cambridge. UK.

Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management,* 14(2), 160-172.

http://dx.doi.org/10.1108/09564230310474138

Reichheld, F.F. (1996). *The loyalty effect: The hidden force behind growth profits and lasting value*. Boston: Harvard Business School Press.

Reinartz, W., & Ulaga, W. (2008). How to Sell Services More Profitably. *Harvard Business Review,* 86(5), 90-97.

Ruiz de Olano, D. (2010). De productos a servicios, el reto de las empresas industriales. El caso del País Vasco. *Boletín de Estudios Económicos,* LXV(200), 343-361.

Santamaría, L., Nieto, J.M., & Miles, I. (2012). Service innovation in manufacturing firms: Evidence from Spain. *Technovation,* 32(2), 144-155. http://dx.doi.org/10.1016/j.technovation.2011.08.006

Tether, B., & Bascavusoglu-Moreau, E. (2011). *Servitization: The Extent of and Motivations for Service Provision amongst UK based Manufacturers.* Working paper. Manchester Business School. University of Manchester. Manchester. UK.

Turunen, T., & Neely, A. (2012). *Organising servitization: an in-depth case study.* Working paper. University of Cambridge.

Veugelers, R. (2013). *Manufacturing Europe's future*. Bruegel Blueprint Series. Volume XXI. Bruegel. Brussels. Belgium.

Viljakainen, A. Toivonen, M., & Aikala, M. (2013). *Industry transformation towards service logic: A business model approach*. Cambridge Service Alliance, Working Paper Series. 12/2013.

Visnjic, I., Van Looy, B., & Neely, A. (2013). Steering manufacturing firms towards service business model innovation. Embracing indicators that reflect market performance. *California Management Review,* 56(1), 100-123. http://dx.doi.org/10.1525/cmr.2013.56.1.100

Nota Bene

The literature review in this paper draws heavily on the literature review in Roos, G. (2015). Servitization as Innovation in Manufacturing—A Review of the Literature. Chapter 19 in Agarwal, R., Selen, W., Roos, G., & Green, R. (eds.). (2015). The Handbook of Service Innovation. Springer-Verlag. ISBN 978-1-4471-6589-7. London. pp. 397-430. In Press.

Author Index Índice

Organized by Orkestra-Basque Institute of Competitiveness and backed by the Deusto Business School, some 75 researchers, practitioners and policy makers gathered to present and discuss contemporary trends and phenomena in the realm of servitization. The 3rd edition had as overarching theme: “Servitization and advanced business services as levers for competitiveness”, and the day-and-a-half programme attracted participants from across the globe (European member states, North America, Oceania).

Apart from the presentation of papers –whose abstracts are gathered in the present document, there were keynote speeches from Prof. Tim Baines (Aston Business School - Birmingham, UK, and an authority in the field of business servitization) and Mr. Julen Barrutia, as representative of CAF (a railway system designer and manufacturer with its home base in the Basque Country, and an early adopter of servitization principles in its business model).

We are confident that this bundle of abstracts provides interested readers with baseline information on the works presented and discussed at the 3rd IBS conference, and with contact details of the respective authors for eventual follow-up contact.

We also trust that the legacy of 3rd edition of the International Business Servitization Conference leaves a positive legacy in the form of solid fundaments for further networking among the servitization research community and a fertile ground for next editions of this conference series.

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