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The evolution of KIBS between standardization and customization: the rise of Combinatory KIBS

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Abstract

Studies on service management have broadly discussed the relationship between customization and standardization in services. Studies on modularity have enriched the debate by identifying an additional form of service provision able to couple the advantages of these two alternative approaches. However, at the theoretical and empirical level little attention has been given to explore how service firms adopt standardization and modularity on the one hand, and whether they are able to combine different types of services in their offering, on the other hand. This question is particularly interesting in the domain of Knowledge-Intensive Business Services (KIBS). Literature on KIBS has stressed

the high level of service customization KIBS can offer to their business customers, within a collaborative and interactive framework for innovation. However, scholars dedicated little attention on how KIBS develop their service offering and whether the customization is the only strategy they adopt. The aim of the paper is to explore the business service portfolio of KIBS to identify business service management strategies KIBS develop between bespoke services and standardization. Empirical analysis on about 500 Italian KIBS specializing in design and communication, ICT services and professional services show that there are KIBS providing fully standardized services and also the rise of combinatory KIBS able to mix bespoke and standard services with business characteristics similar to the other KIBS profiles.

1. Introduction

Literature on service management has depicted services as customized outputs, where the level of customization is intrinsically related to its intangible dimension (Zeithaml *et al.*, 1985). However, few studies also discussed the standardization processes within services, by considering how service providers can gain efficiency through standardization and increase their low level of productivity (Baumol's disease, Baumol and Bowen, 1966), consistently with the domain of goods (e.g., Enis, Roering, 1981). As it occurred in manufacturing, also service firms can overcome their limitation by investing in standard services and standard service delivery processes. As demonstrated by McDonalds (Ritzer, 1993), standardization leads to economies of scale and productivity. Customers may suffer from a limitation in their choices, but gain from an economic point of view (lower prices).

Between customization and standardization Sundbo (1994, 2002) has proposed a third strategic path focused on modularity (see also Voss and Hsuan, 2009). The service provider develops standard modules that can be combined by the customer. This leads to higher rates of productivity based on standardization of modules, but at the same time this strategy offers customers the opportunity to adapt the service to their needs. This perspective overcomes the traditional dichotomy between customized and standard services, and many empirical analyses show that this variety of service offering is widespread among service specialization and also within the same service firm (Baldwin, Clark, 1997; Hipp *et al.*, 2000; Tether *et al.*, 2001). However, a theoretical and empirical gap still exist in describing more precisely how service firms approach standardization and whether their offering can also combine customized, modular and standard services.

Within the service domain, an interesting area where to explore this research question is the KIBS specialization. A growing number of studies explored knowledge-intensive business services, better known as KIBS (e.g., Muller and Doloreux, 2009). From the literature, it emerges the profile of a firm oriented to offer up-to-date knowledge to their customers, whose business orientation increases the level of their request compared to services for the final market. KIBS are also particularly important since they contribute to customers' innovation processes, providing different knowledge dimensions from analytic to synthetic and symbolic knowledge (Strambach, 2008). While on the one hand KIBS can act as sources or carriers of knowledge (Miles *et al.*, 1995), on the other hand, collaboration with customers through interaction is a peculiar KIBS' characteristic described in the literature. The level of service customization KIBS provides is consistent with its market request, where business customer asks for services tailored to their needs.

A detailed analysis of standardization processes in general and in KIBS in particular is still underdeveloped. Among the studies on KIBS the seminal research by Tether *et al.* (2001) provides a first tentative to going beyond the customization lenses in observing KIBS, classifying KIBS according to the level of turnover based on customization. Nevertheless, little has been said on modularity in the KIBS domain. Moreover, a gap still exists in the analysis of business service portfolio in the KIBS domain. The aim of the paper is to explore the business service portfolio of KIBS to identify business service management strategies KIBS develop between bespoke services and standardization. The second section of the paper theoretically discusses studies focusing on customization and standardization in services in general and specifically within KIBS. The third section presents an empirical analysis of about 500 Italian KIBS specializing in

design and communication, ICT services and professional services and discusses the results. A conclusive section is then proposed.

2. Theoretical framework: customization vs. standardization in services and KIBS

2.1 Interaction, co-production and service customization

The idea that services are necessarily customized has been developed a long time ago. We can identify a date for its birth in 1981, when the American Marketing Association focused its congress on services. In such occasion, two opposite perspectives face each other, based on the studies of Enis e Roering (1981) on the one side and of Lovelock (1981) on the other side. The former view confirms the application of the general marketing principles developed in the manufacturing domain also for services. The latter view instead maintains that services are quite different from goods and, hence, the need for a complete different marketing approach in services. It is specifically this second perspective to prevail not only within the marketing field, but also in management studies (Normann, 1984; Eiglier and Langeard, 1987), consistently with the strong development of tertiary activities and their increasing economic relevance.

According to the scholars supporting this viewpoint, the distinction between services and goods is based on the peculiarities of services, on their special characteristics. The first characteristic refers to the intangible dimension of services, as the primary difference with goods. From this characteristic other three ones then follow (Zeithaml *et al.*, 1985):

- a. Services cannot be standardized, and hence it emerges their heterogeneity;
- b. Services are perishable and hence they cannot be stored;
- c. Services require simultaneity and hence it emerges the indivisibility between service production and consumption.

All these aspects are strictly interconnected and together they shape the specificity in the service production, where the service provider and the customer interact to co-produce the output (Mills, 1986). Service customization is based on such process. From a certain point of view it can be considered the positive side of the non-standardization of services: the impossibility to produce and offer two identical copies of services is a constraint that becomes an opportunity, whenever an effective interaction between service provider and customer leads to the production, or better to the co-production, of two service versions, each one perfectly fitting the needs of two different customers.

Hence, customization as a peculiar trait of services would be justified by the service intangibility. However, this source of service characteristics has been criticized by many studies and particularly by the Shostack's bright analysis (1982). By analyzing a large variety of products based on their attributes and benefits, the author highlights that the majority of them are not completely tangible or completely intangible. Rather they are a combination of both elements. It is interesting to note that, among the most intangible services explored by Shostack, he cited those provided by advertising agencies and consulting firms, that nowadays are included in the category of knowledge-intensive business services (KIBS).

About two decades after, studies identifying KIBS as a relevant and promising research area ideally connect with Shostack's classification, by stressing customization as one of the main trait of such kind of services. Those pioneering studies focused their attention

on the relationship between service provider and customers putting in evidence that, when the service is knowledge-intensive, those players strongly interact in the service provision. From the cognitive point of view, interaction leads to knowledge co-production (and innovation). From the output point of view, interaction allows producing customer-tailored services (den Hertog, 2000; Muller and Zenker, 2001; Strambach, 2001; Bettencourt *et al.*, 2002).

In particular, Bettencourt *et al.* (2002) give high relevance to customization, including this issue in the same definition of KIBS firms “whose primary value-added activities consist of the accumulation, creation, or dissemination of knowledge for the purpose of developing a customized service or product solution to satisfy the client’s needs” (pp. 100–101). The authors add that it is exactly the high level of service customization, in addition to its complexity, to force customers to play the role of co-producers of knowledge. In fact, they own a significant piece of knowledge – both codified and tacit one – that becomes essential for KIBS to provide their services successfully. Such knowledge is activated, for instance, in the joint resolution of problems that emerge in the process of service production.

2.2 Standardization and modularity in services

Among the distinctive traits of services identified by the supporters of the demarcation thesis, the less satisfied one is the impossibility to standardize services. In reality, many services can be standardized partially or totally through technologies developed accordingly or through an adequate training of contact personnel. On these bases, in the 1970s Theodore Levitt (1972, 1976) proposed an industrialized, production-line approach to service. The author stressed the low efficiency and wide variations in quality of the service world, because of the artisanal form of service production. On the opposite, there was the hamburger production by McDonald’s that Levitt described as “a supreme example of the application of manufacturing and technological brilliance to problems that must ultimately be viewed as marketing problems” (1976, p. 44).

In the Levitt’s thought the segment of completely standardized services would have prevailed. However, this viewpoint failed due to the customer’s requests: not only business customers of KIBS, but also consumers continue to ask for personalization even in very simple services. It is not by chance that also McDonald’s started to offer variety to its customers (Bowen and Youngdahl, 1998).

In the meantime, the rise of mass customization (Pine, 1993) and specifically the approach to mass customization based on modularization and postponement has re-launched the industrialization of services, by removing the constraints to standardized outputs (Sundbo, 1994; Hart, 1995). In fact, through the loose coupling of a limited number of modules characterized by standard interfaces the service provider can obtain a large variety of service configuration, driven by the interaction between the firm and its customers and related to customers’ individual needs. In such a way, the producer can couple the cost advantages of standardization and the effective link with the demand through customization (Feitzinger and Lee, 1997).

The modular customization represents an approach conceived to design and produce both manufacturing goods and services, described in the Pine’s seminal work (1993). Nevertheless, while there is large body of empirical studies that analyzed the application of modularization in goods, research concerning services is very limited. Sundbo (1994), based on a comprehensive number of interviews in most Danish service industries, observed a growing tendency towards the modularization of service activities. By

modulization (in Sundbo's word) service firms "attempt to combine rationality and cost saving with focusing on the need of the individual customer. Service products are standardized, but in modules which can be combined individually by the single customer" (p. 263). Sundbo noticed that in the case of KIBS modularization was less frequent than in other services, usually limited to large and internationalized KIBS. In addition, such approach to service provision was a slight form: standardization refers to the idea of the service product, but not to the production process of the service, or better the service modules. However, few examples stressed that even in the KIBS domain there were not structural constraints to obtain a complete modularization. In one of the most cited articles on modularity, Baldwin and Clark (1997) highlighted that this approach is particularly adapted to services specifically due to their intangible dimension. They cited the financial services as the service sector in which the modularity is more diffused. In fact they are "purely intangible, having no hard surfaces, no difficult shapes, no electrical pins or wires, and no complex computer code" (p. 88). They are relatively easy to conceptualize, design and manage in a modular way. By referring to the same sector, a less optimistic view is proposed by Papathanassiou (2004) who conducted a study of 35 information technology and marketing managers of banks and insurance companies in the UK. From his study it emerges that more than three fourth of the respondents believe that mass customization is possible in their organization. Nonetheless, its application is limited by the competences to develop a modular architecture of services and an effective interaction with customers for the customization of services. Peters and Saidin (2000) have positively verified the applicability of modular customization to a firm that provides information technology services, by highlighting at the same time the constraints experienced by the firm and the efforts needed to overcome them. Another case study deeply explored the logistic sector (Pekkarinen and Ulkuniemi, 2008).

Modularity represents then an effectual path even in service firm. The presence of modular services has broken the usual dichotomy between customized services and standardized services. If we look at the output, in fact, modular services can be referred to the category of customized services, in addition to the traditional type of customizable services not based on modules, named fully customized services or even bespoke services. If we look at the production process, instead, modular services can be included in the category of industrialized services, in addition to fully standardized services.

2.3 Combining customized and standardized services

Literature on services shows that there are multiple approaches to service product, where such variety can exist in each of the different service categories, also considering the KIBS industry. However, we argue that this variety of approaches to service production can also coexist within the same service provider. This idea can be supported by few empirical studies.

The first two studies are related to the same research project carried out based on the 1995 survey of innovation in German services companies (Hipp *et al.*, 2000; Tether *et al.*, 2001). According to the questionnaire, researchers obtained data concerning the distribution of the firm's turnover among the following types: standard(ized) services, defined as those without customer specific change; partially customized services; bespoke services, i.e. fully customized services. A first important result obtained is the discovery that only a limited group of service providers (28.7% out of 2.151 firms

interviewed) offer just one type of service. Instead, all the other ones offer different service types at the same time. A second interesting result is based on the analysis of service specialization: considering the distribution of income in the average firm, in each service sector all the three types of services are offered, even though there are differences among the sectors (with a larger presence of partially or fully customized services in particular in KIBS industries). The authors also identified a categorization of service firms based on the turnover distribution among the three types of services, aiming at explicating significant relations with innovative activities. In this view, however, results are influenced in our view by the too broad and general definition of “partially customized services”, that the respondents could have understood both in terms of modular services or standard services with limited customization.

Sundbo (2002) used two surveys concerning service firms in Denmark carried out in different time period and gathering information on services offered based on the following classification: fully customized, modularized and fully standardized. Sundbo was interesting to measure an eventual growth in the offering of modular services during the years, and his idea was confirmed by the empirical analysis. Even though his research does not enter in detail on the data explored, there is a confirmation of the fact that many service firms do not provide only one type of services.

In an empirical study of a sample of KIBS in the Veneto Region (North-East Italy) specialized in design and communication, Bettiol *et al.* (2011) found that the large majority of services offered by those firms are fully customized. Nevertheless, even this study signals service providers offering multiple types of services, i.e. fully customized and modular ones. An additional interesting element in this study is the service classification used by the authors, where services are grouped into the following types: fully standardized services, standard services with limited customization, modular services, fully customized services. In such a way, by admitting also two intermediate types of services, the ambiguity generated by the category of partially customized services is avoided and, at the same time, they adopt a wide vision concerning modular services.

From all those studies the non-marginal existence of firms combining services emerges, structurally different one from the others. Despite this presence has appeared, stressing the internal variety in the service provision, it has not been put under complete scrutiny by scholars, both theoretically and empirically. Above all, a key research question is whether service providers explicitly decide to combine different types of services instead of just focusing on one of them, and the strategic and managerial implications of such approach to services provision.

3. Empirical analysis

3.1 Methodology

In order to answer to this question we carried out a quantitative analysis based on the type of services proposed by Bettiol *et al.* (2011). The sample includes only KIBS firms in order to reduce the strong sectoral differences among the whole service domain with respect to the focus of our analysis.

The data for the analysis are drawn from a survey we conducted in between July and November 2009 at KIBS located in the Veneto region (North-East Italy). Data were collected through phone interviews with KIBS' entrepreneurs or owners based on an 8-

pages long structured questionnaire. A specialized survey company has conducted the interviews. The questionnaire had 3 sections, inquiring on firm's structural characteristics and market strategies, on entrepreneurship and firm's organization and on networking activities. The total number of firms contacted was 2,984 KIBS, selected randomly from the universe of 7,049 KIBS located in the region registered within the system of Italian Chambers of Commerce or belonging to accountancy profession, collecting 512 responses. Since some firms were not located in the Veneto region or were not KIBS but other type of service firms (i.e. manufacturing firms), we have been left with 505 valid responses.

In this empirical setting, we considered as KIBS firms specialized in IT and related services, in professional services – including business and management consulting and legal and accounting activities – and in design and communication, which is representative of the KIBS sector as identified in the literature (Miles, 2005; Muller & Doloreux, 2009). The sample is representative of the underlying universe and is homogeneous with regard to the nature of the services provided by the KIBS, consisting of 154 IT firms (30.5% of the overall sample) (NACE Code: 72), 155 design and communication (30.7%) (NACE Code: 74.13, 74.2, 74.4) and 196 professional firms (38.8%) (NACE Code: 74.1).

In order to evaluate the characteristics of the business service portfolio and to identify business service management strategies of KIBS we classified responding KIBS according to the level of customization of their offering. More precisely KIBS were asked to split their turnover from 0 to 100% into four different categories, as follows:

- a) *bespoke services*, that is fully customized services offered to customers;
- b) *standard services with limited customization*, where the core of the service offered is standardized, but the customer can ask for limited levels of adaptation;
- c) *modular services*, where the single module is standard and the final service provided to customer is based on customer's combination (mass customization approach);
- d) *standard services*, that is services completely standardized.

Thus, the dependent variable we use in the analysis indicates how the KIBS arranges its business service portfolio. Since our study is exploratory we refer to structural variables and variables related to market management and innovation management to evaluate similarities and differences in KIBS' profiles related to their business service management strategy.

3.2 Results

Table 1 presents the results concerning the business service portfolio of KIBS. According to the data, a first important outcome of our analysis refers to the high variety of services offered by KIBS, where the bespoke strategy is one of the several strategies implemented.

Table 1 – KIBS' business service portfolio

<i>Turnover based on business service types</i>	<i>n.</i>	<i>%</i>
100% bespoke services	227	46.9
100% standard with limited customization	60	12.4

100% modular services	38	7.9
100% fully standardized services	10	2.1
Bespoke and standard service with limited customization	48	9.9
Bespoke and modular services	40	8.3
Bespoke and fully standardized services	30	6.2
All the four business service types	6	1.2
Other combinations	25	5.2
Total*	484	100.0

*The total number of KIBS considered is lower than 505 due to outliers on turnover variable.

In section 2 we stated that modularity can be included into the broad standardization strategy where the firm standardizes each module and let the customer combine them into a final customized service within a range of options defined *ex-ante* by the service provider.

In this framework, we created three different KIBS profiles according to the two strategic approaches identified: bespoke services and standard services. However, as emerged from table 1, there is a large number of KIBS that offers not only “pure” bespoke or standard services, but also a combination of more than one business service types. From this first result we created three KIBS’ profiles, as follows (Table 2):

1. *Bespoke KIBS*, which are KIBS that offer only bespoke services;
2. *Industrialized KIBS*, which are KIBS that offer 100% of fully standardized services, 100% of standard services with limited customization as well as 100% of modular services;
3. *Combinatory KIBS*, which combine Bespoke and Standardized services

Table 2 – KIBS’ profiles

	<i>n.</i>	<i>%</i>
Bespoke KIBS	227	46.9
Combinatory KIBS	149	30.8
Industrialized KIBS	108	22.3
Total	484	100.0

While almost half of our sample is specialized in bespoke services, table 2 shows that there are also KIBS focused only in fully standardized services. More important, there is also one third of interviewed KIBS that offer a wide range of business services from bespoke to standard and modular ones. The main specialization of bespoke KIBS is design (47.1%), professional firms for Combinatory KIBS (48.3%) and ICT for Industrialized KIBS (50.9%). Table 3 includes variables related to the firm’s structure, market and innovation management to explore differences and similarities among KIBS’ profiles based on their business service offering.

Table 3 – KIBS' business characteristics

<i>Variables\KIBS' profile</i>	<i>Bespoke KIBS (1)</i>	<i>Combinatory KIBS (2)</i>	<i>Industrialized KIBS (3)</i>	<i>Sig.</i>
Age (average value: 2011 - year of foundation)	11.63	10.29	10.24	
2008 Total turnover (thousand €)	293.68	323.94	234.60	
Total Employees (2008)	4.56	7.13	5.36	All***
% Turnover of 1 st customer	33.51	20.31	15.58	All***
% Turnover of first 3 customers	51.70	34.23	24.16	All***
<i>Market extension</i>				
Regional KIBS (100% of the turnover in the Veneto region)	34.7	27.2	42.1	2-3**
National/international KIBS (at least 1% of turnover outside the region)	65.3	72.8	57.9	2-3**
<i>Interaction with customers</i>				
High interaction with customers through meetings	69.3	59.2	45.6	1-3*** 2-3**
High frequency of personnel transfer from KIBS to client firm	44.1	55.6	39.8	1-2** 2-3**
<i>Innovation management</i>				
Clients as sources of knowledge (1=low, 5=high) for:				
- Research and technology	2.97	2.99	2.74	
- New service development	3.19	3.27	2.96	
- Process Improvement of service delivery	2.8	3.11	2.56	All***
- New market identification/entrance	3.12	3.05	2.68	All***
Investment in patents, design or models, trademarks	25.5	26.0	18.4	
High level of internal codified knowledge sharing	63.2	76.4	78.6	1-2** 1-3***
<i>Networking</i>				
Degree of vertical integration (use of only internal resources for service provision)	34.1	29.5	42.6	2-3**
KIBS coordinates other suppliers (position in the value chain) (average value on % services offered)	58.52	52.34	42.12	All***
Number of collaborations:				
- 1-9 collaborations	81.8	72.1	89.3	2-3**
- > 10 collaborations	18.2	27.9	10.7	2-3**
<i>Investments in ICT</i>				
Average number of ICT adopted (0 - 9) ^o	1.52	2.33	1.61	All***
Adoption of ICT (% of KIBS that have at least one type of ICT)	61.2	82.6	65,7	All***

Web CRM	35.0	50.4	33.0	1-2*** 2-3***
ERP	15.0	27.0	19.4	1-2***

° ERP, groupware, DSS, datawarehouse/datamining, elearning, intranet, SCM, e-commerce, web-CRM

*p<0.1; ** p<0.05; ***p<0.01

Demography and firms' structure. The three KIBS' profiles show no statistically significant differences in terms of age and turnover although Combinatory KIBS have, on average, a larger turnover than the other profiles. If in terms of structural variables those three profiles seem similar, there are several differences in how those services organize their work and client portfolio. Combinatory KIBS have an average number of employees equal to 7.13 and are larger than both Bespoke (4.56) and Industrialized KIBS (5.36). The level of market concentration – measured through the percentage of turnover related to the first one and first three customers – highlights the different approaches to markets: Bespoke KIBS have a high concentration due to the need for interaction and the value achieved through service customization. Industrialized KIBS have, instead, a low concentration rate, while Combinatory KIBS – that includes different level of service customization – have an intermediate position with smaller market concentration than the Bespoke, although bigger than the Industrialized ones.

Market Extension. Combinatory KIBS outperform both Bespoke and Industrialized in terms of the capability to extended their market beyond the regional level. In fact, almost 73% of Combinatory KIBS have clients at a national (outside the region they are based in) or international level, while Bespoke and Industrialized have relatively 65.3 and 57.9%.

Interaction with customers. Results confirm the role of interaction between the KIBS and its customers – through meetings as well as through personnel exchange – when customization is concerned. On the one hand, Industrialized KIBS declared lower relevance of customer interaction, due to the standardization of their offering. On the other hand, Combinatory KIBS have levels of interaction that are closer than Bespoke KIBS. In the case of interaction by transfer of personnel, Combinatory KIBS have the higher frequency with 55.6 than Bespoke (44.1) and Industrialized (39.8)

Innovation Management. Customers play a crucial role in KIBS innovation. In particular, information provided by clients is helpful for both designing new services and improving existing ones. Bespoke and Combinatory KIBS give more importance to the knowledge coming from the client than Industrialized KIBS in terms of improvement of service delivery, where Combinatory have an average of 3.11, Bespoke 2.8 and Industrialized 2.56, and in terms of new market opportunities, where Bespoke have 3.12, Combinatory 3.05 and Industrialized 2.68. Although is not statistically significant, Bespoke and Combinatory KIBS have a higher investment in Intellectual Property Rights than Industrialized KIBS. As it is expected Industrialized KIBS present a high level of internal codified knowledge sharing (78.6) in line with the process of standardization. Not surprisingly, Bespoke KIBS have lower rate (63.2) in terms of codified knowledge sharing, and this is coherent with their model of customization and ad hoc services. Interestingly, Combinatory KIBS with 76.4% are in line with Industrialized KIBS as regards the use of codified knowledge.

Networking. Industrialized KIBS rely more on vertical integration in order to provide their services, opposite to the other two profiles: Bespoke and Combinatory KIBS tend to manage more complex value chains, by organizing a network of other firms with whom to collaborate for service provision. In particular, Combinatory KIBS collaborate with a greater number of firms. Observing the number of collaboration managed by KIBS also confirms this networking capability: specifically, about one third of Combinatory KIBS have more than 10 collaborations with other firms and or institutions (from the same sector or specialized in other sectors).

Investments in ICT. The table points out a clear result: Combinatory KIBS have a higher adoption of ICT in terms of both quantity (number of ICT) and quality (typologies). Moreover Combinatory KIBS invested in technologies for knowledge codification such as ERP (Enterprise Resource Planning) as well as in technologies for interaction with the final customers (and therefore personalization such as: web solutions for CRM (Customer Relationship Management)).

3.3 Discussion

Our empirical analysis captures the variety of KIBS' business service management strategies, showing how customization is one of the alternative strategies implemented by Italian KIBS. According to our results in fact KIBS are not necessarily oriented toward bespoke service offering, as stressed by the majority of studies on KIBS. On the contrary, there is also a group of KIBS specializing in standardization, which provide fully standardized services, standard services with limited customization or modular services in a framework of mass customization. Those KIBS – that we named neo-industrial KIBS – are characterized by higher level of vertical integration. More important, they present lower level of interaction with customers, consistently with their strategic option. They have also a lower degree of market concentration, that is their service standardization is oriented toward the “business mass market”.

In addition, a remarkable result of our analysis shows that there are multiple KIBS' profiles, where customization and standardization are two opposite models, but where also emerges a new third and distinctive profile: Combinatory KIBS. We argue that such kind of KIBS is not a marginal, residual group of KIBS. Rather, it expresses a new strategic approach to business service provision, where Combinatory KIBS originally combines different features of both Bespoke and Industrialized ones.

The Combinatory KIBS achieves similar or even superior market performances (in terms of customers) of Bespoke and Industrialized KIBS, showing the strength of a peculiar strategic approach to business service management. Combinatory KIBS has in fact organizational capabilities that sustain a coherent mix between customization and standardization of business services, combining a larger customer portfolio and market extension with almost identical turnover rates and trends (higher size measured in terms of employees).

As a matter of fact, Combinatory KIBS have characteristics that in part belong to customization and in part to standardization strategy. Indeed, Combinatory KIBS highly interact with customers, as much as Bespoke do, in order to personalize their services. This is also evident if we consider the important role that both for Bespoke and Combinatory KIBS the client plays in terms of service innovation and delivery. Clients are an important source of innovation especially for improvements in service delivery

and for identification of new markets. In both these cases Bespoke and Combinatory KIBS are higher than Industrialized KIBS.

At the same time, Combinatory KIBS pay attention to knowledge codification and its use. From this perspective, Combinatory behave like Industrialized KIBS and are keen to standardization. Standardization is important in terms of the possibility to re-use the knowledge beyond the specific context in which it was generated. Combinatory KIBS tend to invest in standardization in order to re-use knowledge produced for a specific client (customization).

The capability of mixing both customization (through customer interaction) and standardization (through knowledge codification) go along with specific performances and firm's structure. Combinatory KIBS are on average bigger in size than the other two profiles of KIBS. They are almost double than Bespoke and about 25% bigger than Industrialized KIBS. In terms of client's portfolio, Combinatory KIBS have an intermediate position. Their turnover is distributed among a larger number of clients than the Bespoke but smaller than the industrialized. This is in line with their ability to offer a personalized service to a larger number of clients than Bespoke KIBS. Although this intermediate position in terms of client's portfolio, Combinatory KIBS are able to extend their market size beyond the regional dimension. In fact, Combinatory KIBS attract the attention of clients that are at a distance (national and international dimension) especially if compared with Industrialized. This result is obtained without compromising interaction and customization. Beyond using ICT (see below), Combinatory KIBS transfer temporally part of their personnel to the client firm. This transfer of personnel helps service customization and recreates the same dynamic of interaction that KIBS have with local clients.

As we have seen above, Combinatory KIBS have a strategic profile that is distinct from Bespoke and Industrialized. In particular, Combinatory KIBS mix different characteristics of the other two types. Combinatory KIBS have the same approach to customer intimacy and interaction that Bespoke KIBS have, and, at the same time, they invest in knowledge codification and re-use as much as Industrialized do. This capability of combining different features into a coherent model is achieved through the help of both the management of a complex network of suppliers and the use of ICT.

Compared to Industrialized KIBS and consistently with Bespoke KIBS, Combinatory KIBS adopts the network model to sustain their offering. Differently from Bespoke KIBS, Combinatory KIBS show higher networking capabilities measured in terms of number of collaboration actively developed by the KIBS. Customization, in fact, require to involve other players in the service development and provision in order to exploit specialized competences and to tailor the service.

The use of ICT is strategic. Combinatory KIBS outperform both Bespoke and Industrialized in all the variables that we analyzed. It is interesting to note that Combinatory KIBS uses web CRM solutions to interact with their customers, but at the same time invest in technological solutions such as ERP to control and manage its internal processes and codify information.

4. Conclusions

Our research enriches the framework provided by Tether et al. (2001), through a more detailed specification of the forms of standardization and customization that can occur in the service domain, empirically explored in KIBS. By including modular approach (mass customization) to service management into the broad scheme of service

standardization, our study offers an original contribution on the literature on service management strategy.

The paper discusses and empirically presents the variety of business service management strategies of KIBS, going beyond the well-established portrait of bespoke services offered through interactive collaboration with customers. Our analysis sustains a new interpretative framework of KIBS' strategies and business characteristics, enriching the debate on KIBS (Muller and Doloreux, 2009) and opening furthermore its black box (Muller, 2008).

Combinatory KIBS combine different business service types, from Bespoke to Industrialized services, requiring a new strategic and organizational approach compared to fully Bespoke or Industrialized KIBS. To cope with the variety of their customers' needs and request Combinatory KIBS act combining interaction with codification of processes and knowledge. Moreover it develops a network combinatory approach (Baker *et al.*, 2003), where collaboration with other firms (i.e. other KIBS) enriches its internal competences and knowledge repertoire that facilitates the matching with market demand. In line with the theory on ambidextrous organizations (O'Reilly and Tushman, 2004), we can also interpret Combinatory KIBS as a dynamic organization where exploration and exploitation co-exist. On the one hand, this KIBS' profile explores new market opportunities through direct interaction with customers asking for customized services. On the other hand, KIBS exploit its cognitive resources and innovation results through more standardized services.

Further research should be devoted to explore more in detail how KIBS' profiles manage internally their processes of innovation and service delivery, based on a qualitative analysis. Further attention should also be given to the profile of Combinatory KIBS aiming at investigating its entrepreneurial characteristics. An additional research path could also include an international comparative study to overcome the limitation of the geographical scope of the present empirical research.

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