Service customisation and standardisation in combinatory knowledge-intensive business services

Marco Bettiol, Eleonora Di Maria and Roberto Grandinetti*

Department of Economics and Management,
University of Padova,
Via del Santo, 33 – 35123 Padova, Italy
Fax: +39-049-8274211
Email: marco.bettiol@unipd.it
Email: eleonora.dimaria@unipd.it
Email: roberto.grandinetti@unipd.it
*Corresponding author

Abstract: The trade-off between customisation and standardisation in service offerings has been widely debated in the literatures on service in general and on knowledge-intensive business services (KIBS) specifically. Moving beyond this trade-off, this paper introduces a new type of service offering, called combinatory KIBS, distinguished by their capability to combine customisation and standardisation. Based on a sample of approximately 500 KIBS, our results show that combinatory KIBS develop specific business strategies which achieve superior performance in customisation and standardisation. They pair customer interaction aimed at service customisation and knowledge codification useful in providing standard services, while also investing in networking.

Keywords: knowledge-intensive business services; KIBS; standardisation; customisation; modularity; combinatory KIBS.


Biographical notes: Marco Bettiol is an Assistant Professor in Business Management in University of Padova, Department of Economics and Management ‘Marco Fanno’, Padova (Italy). His research focuses on creativity, design and innovation. More recently he studies knowledge-intensive business services and their relevance for firm’s competitiveness. His research has been published in international books and journals such as: European Planning Studies, Journal of Knowledge Management, Journal of Knowledge Management Research & Practice, International Entrepreneurship and Management Journal, International Journal of Project Management.

Eleonora Di Maria is an Associate Professor in Business Management in University of Padova, Department of Economics and Management ‘Marco Fanno’, Padova (Italy). Her research focuses on internationalisation, innovation and sustainability strategies of firms and local economic systems, as well as on evolutionary trends of knowledge-intensive business services. Her research has been published in international books and journals such as Research Policy, International Journal of Operations & Production Management, Business
1 Introduction

The literature on service management has depicted services mostly as customised outputs in which the level of customisation is intrinsically related to intangible dimensions (Zeithaml and Bitner, 2000). However, some studies have also considered how service providers can increase low levels of efficiency and productivity through standardisation as the goods domain has (Baumol and Bowen, 1966). As in manufacturing, service firms can overcome limitations by investing in standardising services and service delivery processes. As demonstrated by the case of McDonald’s (Ritzer, 1993), standardisation leads to economies of scale and productivity. Customers might suffer from limited choices, but from an economic point of view, they gain through lower prices.

In addition to customisation and standardisation, some authors (Sundbo, 1994; Baldwin and Clark, 1997; Voss and Hsuan, 2009) have proposed a third strategy focused on modularity. In this approach, the service provider develops standardised modules that the customer can combine. The use of standardised modules leads to greater productivity while letting customers adapt the service to their needs. This strategy transcends the traditional binary of customised and standard services by introducing a hybrid form of services structured by standardised modules but able to be customised.

Within the wide services field, the standardisation strategy seems less viable in those organisations that provide knowledge-intensive inputs to the business processes of other organisations such as engineering, R&D services, software development, advertising and market research, accounting and management services (Miles, 2005; Von Nordenflycht, 2010). These knowledge-intensive business services (KIBS) belong to a variety of sectors that differ on the basis of the level of capital intensity and on the relative presence of professionalised workforce (Von Nordenflycht, 2010). Studies on KIBS emphasise the strong interactions between these providers and customers, a characteristic closely related to service customisation (Muller and Doloreux, 2009). KIBS customers are organisations
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that have a problem to solve, a difficult task to perform or an innovation project to develop but do not have all the skills and knowledge needed. These organisations turn to providers of knowledge-based services for assistance. The needs that create demand for knowledge-intensive services are highly varied, and the services that meet these needs are customised, requiring interaction between the supplier and the customer. Delivering these services ultimately becomes a co-production process.

The coupling of interaction and customisation is a distinctive feature of KIBS, which makes them especially suitable for the study of collaborative innovation with customers (e.g. Miles, 2012). However, some scholars indicate that not all KIBS offer fully customised services. The modular and complete standardisation strategies are both feasible for KIBS, and Tether et al. (2001) and Sundbo (2002) found that many service providers (including KIBS) offer more than service type.

Although these conclusions are intriguing, no conceptual framework allows interpreting the variance in service portfolio strategies developed by KIBS. The goal of this paper is to further enrich the theoretical debate about KIBS strategies, their internal organisation for service provision and shed light on the consequences in terms of KIBS performance. As we observe empirically, KIBS strategies not only switch between sides of the customisation-standardisation binary but also mix and match these seemingly opposite specialisations. Although the literature has given great attention to innovation (Muller and Doloreux, 2009), little has been paid to the implications of such strategies for KIBS’ performance. This paper first proposes a new classification of KIBS into three types based on their degree of service customisation or standardisation. The differences among these types are analysed in order to evaluate the effect on KIBS’ performance and the sustainability of combining standardisation and customisation in KIBS’ offerings as a business strategy. Second, this paper theoretically discusses studies on customisation and standardisation in services in general and specifically within KIBS. The third and fourth sections of the paper present the results of an empirical analysis of approximately 500 Italian KIBS specialising in design and communication, information and communication technologies (ICT) services and professional services. Finally, the conclusions are discussed.

2 Customisation vs standardisation in services and KIBS

2.1 Customisation and the co-production of services

The idea that services inherently are customised has undergone a long development since it was introduced in the 1981 Congress of the American Marketing Association, which focused on services. Two opposing perspectives dominated the meeting: one held that the general marketing principles developed in the manufacturing domain also apply to services, whereas the second maintained that services are different than goods and demand an alternative marketing approach (Donnelly and George, 1981). This second perspective prevailed not only in the marketing field but also in management studies (Normann, 1984), consistent with the development of services and their increasing economic relevance.

According to scholars advocating this viewpoint, services are distinguished from goods by their special characteristics. The primary difference is the intangible dimension
of services, from which follow the three other distinguishing characteristics (Bateson and Hoffman, 1999; Zeithaml and Bitner, 2000):

- services cannot be standardised; thus, their heterogeneity emerges
- services are perishable; thus, they cannot be stored
- services require simultaneity; thus, the indivisibility between service production and consumption emerges.

These interconnected characteristics shape the nature of service production in which the service provider and the customer interact to co-produce the output (Eiglier and Langeard, 1987; Grönroos, 2007; Laihonen and Lönnqvist, 2010). Service customisation is based on this co-production process, as highlighted by a long stream of research on business-to-business and business-to-consumer services (Kannan and Healey, 2011). From a certain point of view, service customisation is the positive flip side of the non-standardisation of services. The constraint of the impossibility of producing and offering two identical copies of services becomes an opportunity. The effective interaction of service providers and customers leads to the production or, better, the co-production of two versions of a service, perfectly fitted to the needs of two different customers.

Thus, customisation as a distinguishing trait of services can gain value through service intangibility. However, in an enlightening analysis of a wide variety of products, Shostack (1982) stressed that the majority do not have completely tangible or intangible attributes and benefits but combine both elements. Among the most intangible and customised services, the author identified those provided by advertising agencies and consulting firms. After this study, the internal heterogeneity of the service domain has prevailed and it has been conceptualised in different terms. Most of these typologies are developed on the basis of intuitive appeal, but there are also contributions based on empirical examination (Ng et al., 2007). Among these ones, the classification scheme proposed by Silvestro et al. (1992) identifies three service archetypes: at one extreme, professional firms (high customisation, limited numbers of long-term customers), at the other extreme, mass services (standardised services, high volume), while the category of service shops falls between professional and mass services. Scholars proposed other more complex typologies of services (e.g. Buzacott, 2000; Liu and Wang, 2008), but even in those ones the dichotomy between standardisation and customisation has a central role (Grönroos, 2007; Liu et al., 2008). The same approach refers to online services, which account for a large portion of e-commerce transactions these days and are available on a 24-7 basis (Loonam and O’Loughlin, 2008; Lee and Park, 2009).

Into the heterogeneous service domain, the category related to knowledge-intensive ones has received large attention of many scholars in recent years (Doloreux et al., 2010; Di Maria et al., 2012). The pioneering studies on KIBS focused on the relationships between service providers and clients and have emphasised the strongly interactive or client-related character of the service provided. From a cognitive point of view, interaction leads to the co-production of knowledge (and innovation), and from an output point of view, to customer-tailored services (Den Hertog, 2000; Muller and Zenker, 2001; Strambach, 2001; Bettencourt et al., 2002). In particular, Bettencourt et al. (2002, pp.100–101) consider customisation highly relevant to 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”. The authors add that, in addition to complexity, the high level of service customisation forces customers to play the role of knowledge co-producers (Bettencourt et al., 2002). Customers possess significant pieces of knowledge (both codified and tacit) essential for KIBS to provide services successfully. This knowledge is activated, for instance, in the joint resolution of problems which emerge in the process of service production. In addition to the seminal works mentioned earlier, many other studies on KIBS give priority to the issue of co-production (Muller and Doloreux, 2009), even if recent research (Bettiol et al., 2012; Lehrer et al., 2012) suggests that this process of co-production might be limited to specific stages of the service provision process. In any case, KIBS support the innovation activities of their customers and help them to upgrade their technology, organisational processes and business models. From this perspective, they have a privileged function in the open innovation model (Gallego et al., 2013), which stresses that firms can maintain their competitive advantage only if they are able to exploit knowledge that is beyond their organisational boundaries (Chesbrough, 2007).

2.2 Standardisation and modularity in services

Among the distinctive traits of services identified by supporters of the thesis distinguishing between manufacturing and services, the least satisfying is the impossibility of standardising services. Many services can be partially or completely standardised through technologies developed for that purpose or through adequate training of contact personnel. In the 1970s, Levitt (1972, 1976) proposed an industrialised, production-line approach to services. He pointed to the low efficiency and wide variations in quality in the service world caused by the artisanal form of service production and cited McDonald’s hamburger production as an example of manufacturing and technological excellence applied to service production and marketing.

Levitt believed that completely standardised services would prevail. However, this development failed to occur due to customer requests. Not only KIBS business customers but also consumers continued to ask for personalised services, even for very simple services. Not by chance, McDonald’s soon started to offer variety to customers (Bowen and Youngdahl, 1998).

The rise in mass customisation, specifically the approach based on modularisation and postponement, has restarted the industrialisation of services by removing the constraints on standardised outputs (Sundbo, 1994; Hart, 1995). By offering a limited number of modules with standard interfaces, a service provider can create a large variety of service configurations based on the firm’s interaction with the customer and the customer’s individual needs. The producer thus achieves the cost advantages of standardisation and the ability to meet demand through customisation (Feitzinger and Lee, 1997).

Modular customisation has become an approach to designing and producing manufacturing goods and services (Pine, 1993). Although a large body of empirical studies has analysed the application of modularisation to goods, research concerning services is very limited (Geum et al., 2012). Based on a large number of interviews in most Danish service industries, Sundbo (1994) observed the modularisation of service activities was increasing. Through this approach, service firms attempt to combine efficiency with a focus on the customer needs. Sundbo (1994) notes that modularisation
is less frequent in KIBS than other services, although a few examples stressed that the KIBS domain presents no structural constraints on modularisation.

In one of the most frequently cited articles on modularity, Baldwin and Clark (1997) highlight that this approach is especially suited for services. The researchers identify financial services as the sector in which modularity is the most diffused because such services are relatively easy to conceptualise, design and manage in a modular way. They are “purely intangible, having no hard surfaces, no difficult shapes, no electrical pins or wires, and no complex computer code” [Baldwin and Clark, (1997), p.88]. Papathanassiou (2004) advances a less optimistic view of the same sector in a study of 35 information technology (IT) and marketing managers at banks and insurance companies in the UK. He found that more than three-quarters of respondents believed that mass customisation was possible in their organisations, but application was limited by the competencies to develop a modular service architecture and effective customer interaction (Papathanassiou, 2004). Peters and Saidin (2000) confirm the applicability of modular customisation to an IT services firm but also emphasise the constraints experienced by the firm and the efforts needed to overcome them. Following Papazoglou and van den Heuvel (2007), the IT service modularisation is closely related to service-oriented architecture that addresses the requirements of loosely coupled, standards-based and protocol-independent distributed computing, where services are “well defined, self-contained modules that provide standard business functionality and are independent of the state or context of other services” (p.389). These services have a standard interface through which communicate with each other in order to jointly support a common business task or process.

Modularity thus stands as an effective strategy even in service firms. The development of modular services has undermined the traditional separation of customised and standardised services. When considering the output, modular services are customised services, alongside traditional, non-modular customisable services called fully customised services or bespoke services. When considering the production process, however, modular services can be classified as industrialised services, along with fully standardised services.

2.3 Exploring combinatory KIBS

The literature on services shows that service firms, including KIBS, have adopted different approaches to service offerings (i.e. customised, modular and standardised services). Studies on KIBS have described the variety of their offerings and the difference between P-KIBS and T-KIBS (e.g. Hipp et al., 2000; Muller and Zenker, 2001; Corrocher et al., 2009; Consoli and Elche-Hortelano, 2010). However, few scholars have explicitly discussed whether and how KIBS can combine the two opposite approaches of standardisation and customisation. We propose that different approaches can coexist in each service industry and within the same service firm as an explicit business strategy. This claim draws support from the findings of empirical studies which have begun to discuss this issue, although this point has received limited attention in studies on services in general and on KIBS specifically.

A well-cited study based on a 1995 survey investigating innovation in German service companies collected data about revenue distribution in firms offering standardised services (without customer-specific changes), partially customised services and fully customised services (Tether et al., 2001). Only a limited group of service providers
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(28.7%) offered only one type of service; the rest offered different types simultaneously (Tether et al., 2001). A second interesting result came from the sectoral analysis performed by Tether et al. (2001): Based on the income distribution in the average firm, all three types of services were offered in all service industries, even though there were differences among sectors (particularly a larger presence of partially or fully customised services in KIBS industries).

In another study, Sundbo (2002) aimed to measure growth in modular services over time. He conducted two surveys of service firms in Denmark at different times and gathered information on the type of services offered: fully customised, modularised and fully standardised. Although lacking detailed data description, his empirical analysis confirmed his hypothesis that many service firms, including KIBS, provide more than one type of service (Sundbo, 2002).

Other studies have classified service firms according to their level of service customisation or standardisation in order to explain the links among technology, innovation and the customisation of service products (Elche-Hortelano and Góngaléz-Moreno, 2007) or to better describe the service process organisation of customisation and mass production (Silvestro et al., 1992). In our view, KIBS can be classified by the degree of customisation or standardisation in their offerings in order to better understand the economic outcomes of their service portfolio strategies. Specifically, we define combinatory KIBS as firms managing service offerings that differ from the traditional customisation-standardisation binary. No studies have addressed the hybrid nature of these KIBS in detail, so we aim to shed light on this category of KIBS with several hypotheses based on the management and service management literature. To ground our hypotheses in the differences between combinatory KIBS and other KIBS, we divide the latter into two categories: bespoke KIBS, which manage completely customised services, and industrialised KIBS, which manage standardised or modular services. We associated modular services with standardised services, rather than customised services, based on the service production process, not the output (see Section 2.2). In this viewpoint, modularity can be included in a broad standardisation strategy, in which the firm standardises each module to define ex ante a range options for the customer to combine modules into a final customised service. The adjective ‘industrialised’ was chosen as standardised and modular services are strongly related to the possible economies of scale which characterise industrial production, as explained earlier.

The well-established Porter (1980, 1985) theory on competitive advantage holds that a strategy combining cost and differentiation advantages does not lead to better results than a focused one (cost leadership versus differentiation). As Tether et al. (2001) points out, firms operating in the same service industry might offer standardised or customised services based on two different strategic goals: cost leadership and differentiation strategy. To clarify this claim, we refer to two firms – A and B – with opposite strategies. Firm A develops a standardised service that can be offered to numerous clients and be profitable even if prices are low (cost leadership) due to economies of scale and, over time, economies of experience. Firm A has a limited margin for this type of service, but the large revenue volume guarantees sustainable profits. In contrast, firm B identifies a niche of clients interested in a service tailored to their needs and develops a coherent offering, aiming at gaining high margins through low revenue volume. These considerations are true for the universe of services and consequently for KIBS (Hansen...
et al., 1999), keeping in mind that the distribution of the firms using these two strategies (A and B) varies significantly across industries.

Santos-Vijande et al. (2013) studied the links between KIBS’ innovativeness and customer involvement in innovation (new service development). Santos-Vijande et al. (2013) found a positive relationship between active customer participation in innovation and KIBS’ innovation rate and overall performance, stressing the link between a clear service strategy (customised/standardised) and the implications for customer involvement. Tether et al. (2012) investigated the performance of UK professional KIBS and found a positive nonlinear relationship between their specialisation (focused strategy) and financial performance (in addition to location effects). Consequently, it should be inappropriate for a KIBS to adopt a mixed strategy, including both standardisation (focus on cost) and customisation (focus on differentiation) in its service portfolio, given the resulting negative performance. Based on the strategic analysis of KIBS’ offerings, we formulate our first hypothesis.

H1 Bespoke and industrialised KIBS attain higher economic performance than combinatory KIBS.

Several studies on KIBS emphasise the strong link between service customisation and client interaction (Muller and Zenker, 2001; Bettencourt et al., 2002; Miles, 2012). In the case of KIBS, this link is necessary because service customisation is related to the solution of a problem or to the development of a project. The client firm does not have all the knowledge and competences necessary to carry out this task and seeks an external subject – the KIBS – which the client has to inform of the specific characteristics (idiosyncratic) of the problem or project (Valminen and Toivonen, 2012). Often, this interaction is not limited to the initial phase of service production, which has led various scholars to talk about knowledge co-production by the KIBS and client, instead of a simple knowledge transfer from the latter to the former (Muller and Doloreux, 2009). Knowledge co-production is especially evident among the KIBS that adopt a customisation strategy because, in the case of industrialisation, the KIBS desire to reduce interaction and the relative costs as much as possible (Miles, 2012). Borrowing terminology from marketing studies, the first and the second type of KIBS target relational customers and transactional customers, respectively (Anderson and Narus, 1991; Garbarino and Johnson, 1999). Thus, for combinatory KIBS whose customer portfolio contains both client segments, we hypothesise a lower average level of interaction compared to KIBS which have only relational customers.

H2a Combinatory KIBS have a lower average level of interaction with customers than bespoke KIBS.

Compared to studies identifying the KIBS-customer relationship as the most important in providing services and capturing the knowledge contribution of KIBS (Muller and Doloreux, 2009), an increasing number of empirical studies emphasises other relationships in the KIBS value network (Koch and Strotmann, 2008; Amara et al., 2009; Bettiol et al., 2011; Grandinetti, 2011). These studies point out that the search for external partners with specific knowledge and competences is related to the high complexity of the services which the KIBS has to develop, as happens when customisation is high. This result, which is in line with several studies on networks’ role as sources of firm competitiveness (e.g. Stevenson and Jarillo, 1990; Lechner and Dowling, 2003; Furlan
and Grandinetti, 2011), leads to further development of H2a, focusing on interaction with partners which are not clients.

H2b Combinatory KIBS, on average, have a lower use of external resources than bespoke KIBS.

The last hypothesis concerns knowledge management, in particular the process of knowledge codification. A considerable amount of knowledge which firms codify is product specific, so the cost of codification increases with the level of product customisation (Balconi, 2002). Consequently, firms that offer customised products codify less than ones offering standardised products. For the latter firms, efficiently managing the codification process is an important competitive advantage. Although analysis of the link between codification and standardisation arises from manufacturing studies (the issue of knowledge codification is scarcely studied in the service literature, even KIBS literature), no theoretical reason, in our opinion, prevents generalising those findings. If interacting with clients and partnering are distinctive competences of bespoke KIBS, we can speculate that knowledge codification plays an equivalent role in industrialised KIBS. Likewise, combinatorial KIBS should codify less than industrialised KIBS on average.

H3 Combinatory KIBS, on average, have a lower level of knowledge codification than industrialised KIBS.

3 Empirical analysis

3.1 Methodology and sample description

To test our research hypotheses, we conducted a quantitative analysis of data drawn from a survey carried out between July and November 2009 on KIBS in the Veneto region (northeast Italy). Data were collected through phone interviews with KIBS entrepreneurs using on a structured questionnaire inquiring about the firms’ structural characteristics, market strategies, entrepreneurship, organisation and networking activities. A total of 2,984 firms selected randomly from the universe of 7,049 KIBS registered with regional chambers of commerce were contacted (identified according to the different sectors of KIBS selected according to NACE codes), and 512 responses were collected. Some responding firms were not in the Veneto region or were not KIBS, leaving 505 valid responses (16.9% of the firms contacted, 7.2% of the universe). The sample population included the three largest KIBS industries identified in the literature (Miles, 2005; Muller and Doloreux, 2009): ICT and related services (NACE code: 72), business consulting and other professional services (NACE code: 74.1) and design and communication services (NACE codes: 74.13, 74.2 and 74.4). The sample was representative of the underlying universe and consisted of 154 ICT firms (30.5% of the overall sample), 96 professional service firms (38.8%) and 155 design and communication firms (30.7%). The number of 500 KIBS was identified at the beginning of the research as the target sample (due to research economic and time constraints), but the sample obtained was conceived to be representative of the heterogeneity of the KIBS located in the Veneto region.

We classified KIBS’ service offerings according to the level of the customisation or standardisation. KIBS were asked to identify the percentage of their total revenues which came from four service types:
1 services fully customised (FC) by customers
2 standard services with limited customisation (LC), in which the core offering is standardised, but the customer may ask for limited levels of adaptation
3 modular services (M), in which individual modules are standardised and the customer decides their combination in the final service (mass customisation approach)
4 fully standardised services (FS).

Working with the classification proposed by Tether et al. (2001), we replaced the category of partially customised services with the two alternatives which this name implies: modular services (Sundbo, 2002) and standard services with limited customisation. Based on our service typology, the dependent variable used in the analysis indicated the arrangement of customisation and standardisation in KIBS’ business service portfolio.

Table 1  KIBS service portfolios

<table>
<thead>
<tr>
<th>Services offereda</th>
<th>No. KIBS</th>
<th>%</th>
<th>Type of KIBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
<td>229</td>
<td>45.53</td>
<td>Bespoke KIBS</td>
</tr>
<tr>
<td>LC</td>
<td>65</td>
<td>12.92</td>
<td>Industrialised KIBS (229, 45.53%)</td>
</tr>
<tr>
<td>M</td>
<td>41</td>
<td>8.15</td>
<td></td>
</tr>
<tr>
<td>FS</td>
<td>11</td>
<td>2.19</td>
<td></td>
</tr>
<tr>
<td>LC + M</td>
<td>5</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>LC + FS</td>
<td>6</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>M + FS</td>
<td>1</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>LC + M + FS</td>
<td>0</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>FC + LC</td>
<td>49</td>
<td>9.74</td>
<td>Combinatory KIBS</td>
</tr>
<tr>
<td>FC + M</td>
<td>43</td>
<td>8.55</td>
<td>(145, 28.83%)</td>
</tr>
<tr>
<td>FC + FS</td>
<td>32</td>
<td>6.36</td>
<td></td>
</tr>
<tr>
<td>FC + LC + M</td>
<td>8</td>
<td>1.59</td>
<td></td>
</tr>
<tr>
<td>FC + M + FS</td>
<td>2</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>FC + LC + FS</td>
<td>5</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>FC + LC + M + FS</td>
<td>6</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>Totalb</td>
<td>503</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

Notes: aFully customised (FC); fully standardised (FS); modular (M); standard with limited customisation (LC).

bThe total number of KIBS is lower than 505 due to outliers in the revenues variable.

Table 1 shows the degree of customisation/standardisation in their service portfolio of the sample of KIBS interviewed. KIBS that offer only fully customised services account for nearly half of the sample, while those that offer only standardised services are almost an exception. The industrialisation approach takes the form of standardisation with limited...
customisation or modularity. Most importantly, KIBS that combine industrialised and customised services are not a marginal proportion of the sample. Therefore, we can aggregate our initial data into categories more useful for the hypotheses tested:

1. bespoke KIBS, which offer only fully customised services (100% of revenues)
2. industrialised KIBS, which offer one or more of fully standardised services, modular services and standard services with limited customisation
3. combinatory KIBS, which combine customised and industrialised services.

As is seen in Table 1, combinatory KIBS are fewer than bespoke KIBS but more numerous than industrialised KIBS. Almost a third of the sample (28.83%) combines customised services with one or more the service types offered by industrialised KIBS. This is a remarkable preliminary result given the literature and empirical analysis focused mainly on customised or industrialised services.

To test our hypotheses, we analysed a number of variables from a structural and managerial point of view. The variables are described in Table 2. Performance was measured by the KIBS’ size, internationalisation process and number of markets and industries served (Roberts, 1999; Santos-Vijande et al., 2013). Partnering was measured by the KIBS’ means of interacting with customers (face-to-face and technological tools such as online customer relationship management [CRM] software) and the characteristics of the KIBS’ network (presence of external partners and number of those partners) (Koch and Strotmann, 2008; Bettiol et al., 2011). Codification strategy was measured through multiple variables: the KIBS’ capacity to embody the knowledge created into patents, designs or trademarks; knowledge codification into formal, shared documentation (level of internal knowledge-sharing codification); use of an enterprise resource planning (ERP) system (integrates the internal and external management of information across the entire organisation through standardised and integrated procedures); and level of reuse of offered services in new service provision (Amara et al., 2009; Bettiol et al., 2011; Palacios-Marques et al., 2011). Structural variables included KIBS specialisation, experience and customer portfolio concentration.

Table 2 Constructs and variables used

<table>
<thead>
<tr>
<th>Construct</th>
<th>Variable</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance (H1)</td>
<td>Size</td>
<td>• Total revenues (thousand €, 2008, average value)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Total employees (number in 2008, average value)</td>
</tr>
<tr>
<td></td>
<td>Increased market share</td>
<td>Market share (compared to competitors, 1 decreased, 2 stable, 3 increased scale) (% of KIBS with increased market share)</td>
</tr>
<tr>
<td></td>
<td>Increased number of industries served</td>
<td>Increased number of industries served (compared to its competitors, 1 decreased, 2 stable, 3 increased scale) (% of KIBS with increased number of industries served)</td>
</tr>
</tbody>
</table>

Note: CRM; enterprise resource planning (ERP); hypothesis (H); information and communication technologies (ICT).
Table 2  Constructs and variables used* (continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Variable</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnering (H2)</td>
<td>Interaction with customers (H2a)</td>
<td>• Frequency of meetings with customers (1 never – 5 always scale, average value)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Frequency of personnel transfers from KIBS to customers (1 never – 5 always scale, average value)</td>
</tr>
<tr>
<td></td>
<td>Networking (H2b)</td>
<td>• Web-based CRM system (% of KIBS with)</td>
</tr>
<tr>
<td></td>
<td>Knowledge codification (H3)</td>
<td>• % of KIBS that rely on external partners for service development and offerings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• % of KIBS that collaborate with 10 or more partners</td>
</tr>
<tr>
<td></td>
<td>Intellectual property strategy</td>
<td>Patents and/or designs and/or trademarks registered (% of KIBS with)</td>
</tr>
<tr>
<td></td>
<td>Knowledge management strategy</td>
<td>• Level of internal codified knowledge sharing (% of KIBS with high level of)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ERP system (% of KIBS with)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Frequency of reuse of services in new service provision (in % of total services offered, average value)</td>
</tr>
<tr>
<td>Structural variables</td>
<td>KIBS specialisation</td>
<td>% of KIBS specialising in design and communication, ICT or professional firms</td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Age (2011–year of founding)</td>
</tr>
<tr>
<td></td>
<td>Customer portfolio concentration</td>
<td>% of revenues from three largest customers (average value)</td>
</tr>
</tbody>
</table>

Note: *Customer relationship management (CRM); enterprise resource planning (ERP); hypothesis (H); information and communication technologies (ICT).

3.2 Results

Table 3 shows the results for the performance achieved by the three categories of KIBS. On average, combinatory KIBS had higher total revenues than industrialised and bespoke KIBS. Additionally, combinatory KIBS had more total employees than the other two groups of KIBS. From 2007 to 2009 (the three years before the survey), combinatory KIBS outperformed industrialised KIBS in the number of industries served while achieving the same level of performance as bespoke KIBS. All three groups increased their market share by the same percentage. When considering performance in KIBS’ internationalisation process, our analysis shows that combinatory KIBS outperformed industrialised KIBS in extending their markets beyond the domestic market. In all performance variables, combinatory KIBS have higher values than the other two categories of KIBS. In particular, for four performance variables, combinatory KIBS have a statistically significant higher value than at least one of the two other categories. In summary, those results do not confirm H1.
Service customisation and standardisation in combinatory KIBS

Table 3  
KIBS performance (H1)

<table>
<thead>
<tr>
<th></th>
<th>Bespoke KIBS (1)</th>
<th>Industrialised KIBS (2)</th>
<th>Combinatory KIBS (3)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (revenues)</td>
<td>341.01</td>
<td>515.91</td>
<td>538.44</td>
<td>**</td>
</tr>
<tr>
<td>Size (employees)</td>
<td>4.60</td>
<td>6.78</td>
<td>8.22</td>
<td>***</td>
</tr>
<tr>
<td>Increased market share</td>
<td>33.2</td>
<td>31.1</td>
<td>38.8</td>
<td></td>
</tr>
<tr>
<td>Increased number of industries served</td>
<td>26.4</td>
<td>16.9</td>
<td>28.5</td>
<td>* (1–2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* (2–3)</td>
</tr>
<tr>
<td>Internationalisation</td>
<td>12.6</td>
<td>3.3</td>
<td>14.9</td>
<td>*** (1–2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*** (2–3)</td>
</tr>
</tbody>
</table>

Notes: Differences in continuous variables were tested with an analysis of variance, and differences in discrete variables with a chi-square test. *p < 0.1, **p < 0.05, ***p < 0.01.

Data relevant to the hypothesis of KIBS’ partnering with other actors in the value network are shown in Table 4. The results confirm the role of interaction between KIBS and customers in meetings about customisation. Bespoke KIBS had the highest frequency of meetings with customers, while industrialised KIBS had the lowest. Interestingly, combinatory KIBS are more similar to bespoke than industrialised KIBS concerning interaction. Regarding interaction through the transfer of personnel from the KIBS to the customer, combinatory KIBS used this method more than the other two categories. Combinatory KIBS invested more than bespoke and industrialised KIBS in web-based CRM solutions to manage remote customer interaction. In interaction with other actors in the value network, bespoke and combinatory KIBS used external resources to collaborate on service development and offerings at the same frequency as bespoke KIBS and more frequently than industrialised KIBS. In the number of collaborations managed by KIBS, combinatory KIBS clearly stand out: More than one fifth had more than 10 collaborations with other firms and/or institutions from the same sector or specialised in other sectors. In conclusion, we cannot confirm that, on average, combinatory KIBS partner less than bespoke KIBS with customers (H2a) and other types of actors (H2b).

Table 4  
Interaction and networking (H2)

<table>
<thead>
<tr>
<th></th>
<th>Bespoke KIBS (1)</th>
<th>Industrialised KIBS (2)</th>
<th>Combinatory KIBS (3)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interaction with customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of meetings with customers</td>
<td>3.79</td>
<td>3.21</td>
<td>3.68</td>
<td>***</td>
</tr>
<tr>
<td>Frequency of personnel transfers from KIBS to customers</td>
<td>2.92</td>
<td>2.94</td>
<td>3.47</td>
<td>***</td>
</tr>
<tr>
<td>KIBS with a CRM system</td>
<td>36.0</td>
<td>35.7</td>
<td>56.9</td>
<td>*** (1–3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*** (2–3)</td>
</tr>
<tr>
<td>Networking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of external resources for service development and offerings</td>
<td>65.8</td>
<td>58.1</td>
<td>69.7</td>
<td>** (2–3)</td>
</tr>
<tr>
<td>Collaboration with 10 or more partners</td>
<td>11.4</td>
<td>9.3</td>
<td>22.1</td>
<td>*** (1–3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*** (2–3)</td>
</tr>
</tbody>
</table>

Notes: Differences in continuous variables were tested with an analysis of variance, and differences in discrete variables with a chi-square test. *p < 0.1, **p < 0.05, ***p < 0.01.
Data concerning H3 are shown in Table 5. The three KIBS’ profiles presented no statistically significant differences in codification measured by the registration of patents, designs and trademarks. Additionally, the three groups’ level of internal codified knowledge sharing is not different. Combinatory KIBS invested in ICT for knowledge codification, such as ERP, at similar levels as industrialised KIBS. As expected, industrialised KIBS reused services to provide new services in half of the cases, stressing KIBS’ codification of knowledge into services and reuse in developing new services. In contrast, the value for this indicator is very low for bespoke KIBS, while combinatory KIBS have a higher value than bespoke KIBS but significantly lower value than industrialised KIBS. Therefore, if we accept this result, we have to conclude that H3 is not supported.

Table 5  Knowledge codification (H3)

<table>
<thead>
<tr>
<th></th>
<th>Bespoke KIBS (1)</th>
<th>Industrialised KIBS (2)</th>
<th>Combinatory KIBS (3)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual property rights strategy</td>
<td>26.2</td>
<td>20.2</td>
<td>25.5</td>
<td></td>
</tr>
<tr>
<td>Internal codified knowledge sharing</td>
<td>52.4</td>
<td>52.2</td>
<td>55.3</td>
<td></td>
</tr>
<tr>
<td>KIBS with an ERP system</td>
<td>14.9</td>
<td>23.3</td>
<td>29.9</td>
<td>*** (1–3)</td>
</tr>
<tr>
<td>Reuse of services in new service provision</td>
<td>13.5</td>
<td>51.0</td>
<td>37.9</td>
<td>***</td>
</tr>
</tbody>
</table>

Notes: Differences in continuous variables were tested with an analysis of variance, and differences in discrete variables with a chi-square test. *p < 0.1, **p < 0.05, ***p < 0.01.

Three structural variables were included to evaluate whether the KIBS industry, age or customer portfolio concentration is related to its portfolio strategy. Our results show statistically significant differences between KIBS specialised in different industry (design and communication and in ICT services). The three profiles show no statistically significant differences in experience (age). Finally, the level of customer portfolio concentration (measured by the percentage of revenues drawn from the firm’s three largest customers) highlight different approaches to markets: Bespoke KIBS had a high concentration due to the need for interaction and the value achieved through service customisation. Industrialised KIBS had a low concentration rate, while combinatory KIBS fell in the middle, with a market concentration smaller than the bespoke KIBS but larger than industrialised KIBS.

4 Discussion

This empirical analysis shows that the dichotomous categories of fully customised and standardised services describe only a segment of the complex world of KIBS. In addition to bespoke KIBS, many KIBS do not offer fully standardised services but nearly standardised services (with a limited degree of customisation) or modular services (with standardised modules). These three types of services share a degree of standardisation, so we call their providers industrialised KIBS. Most importantly, our study shows that, in addition to industrialised and bespoke KIBS, a third distinctive KIBS profile emerges which we describe as combinatory KIBS.
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According to our hypotheses grounded in the literature, the mixed business strategy of combinatory KIBS should produce poor performance, with lower results in interaction/networking (compared to bespoke KIBS) and knowledge codification (compared to industrialised KIBS). However, based on the results of our empirical study for performance, partnering, and knowledge codification, we can maintain that this category of KIBS exists and is neither marginal nor residual, as hypothesised based on earlier studies. These KIBS show a deliberate strategic approach to providing business services by combining elements of customised and industrialised services. Despite the sample is limited to KIBS in the Veneto region, it represents the variety of KIBS categories, hence in our view our results can support a more complete discussion on KIBS behaviour and consequences in terms of performance. Hence, we find this outcome of our research especially important as it sheds new lights on the KIBS domain in the literature and opens new directions for research on KIBS business models and organisation.

According to our study, combinatory KIBS achieve similar or even superior performance compared to bespoke and industrialised KIBS, showing the robustness of a clear strategic approach to managing business services and capabilities which sustains a coherent mix of customisation and standardisation in services. Combinatory KIBS, on average, are larger the other two KIBS profiles. Additionally, combinatory KIBS penetrate beyond their regional market. They attract the interest of long-distance clients more than the other two categories. This result is attained without compromising customer interaction and customisation. As well as using ICT (see below), combinatory KIBS often temporarily transfer their personnel to client firms. This transfer helps service customisation and re-creates KIBS’ dynamic of interaction with local clients. Therefore, the combinatory KIBS in our sample stand as good examples of suppliers that use temporary geographic proximity, a supplier strategy observed in several business-to-business markets (Roberts, 1999; Knoben and Oerlemans, 2006).

Combinatory KIBS have a strategic profile distinct from that of bespoke and industrialised KIBS. In particular, combinatory KIBS mix various characteristics of the other two categories. Like bespoke KIBS, combinatory KIBS frequently interact with customers to personalise service offerings. At the same time, combinatory KIBS offer more or less standardised services and, thus, codify knowledge, as do industrialised KIBS. We can also assume that combinatory KIBS interact with specific customers needing personalised services and, in this way, generate or, better, co-generate tacit knowledge; subsequently, combinatory KIBS codify this knowledge and use it to develop and offer a standard service on a larger scale. This speculation is in line with the studies of Strambach (2008), who found that knowledge codification is at the heart of the de-contextualisation process which KIBS use to extrapolate from a specific experience of client interaction generalisable knowledge that can be used with other clients.

This capability to combine different features into a coherent model is achieved through managing a complex service network and using ICT. It is not by chance that combinatory KIBS outperform bespoke and industrialised KIBS in the use of complex ICT systems: A relatively higher number of combinatory KIBS adopt web CRM solutions to interact with customers and technological solutions, such as ERP, to control and manage internal processes and codify information and knowledge.

Compared to industrialised KIBS and similarly to bespoke KIBS, combinatory KIBS frequently work in what Evanschitzky et al. (2007) call knowledge-intensive business networks. Indeed, to combine and exploit specialised and complementary competences,
the intrinsic complexity of customisation requires other players’ involvement in developing and providing services. As demonstrated by other studies (Zaefarian et al., 2013), KIBS invest in business relationships consistent with their strategy, with implications for their relationship and overall performance. Considering network size, as measured by the number of collaborations actively developed by the service provider, combinatory KIBS are even larger than bespoke KIBS.

5 Conclusions

Starting with the typologies of business services proposed by Tether et al. (2001) and Sundbo (2002), our research develops a more detailed specification of the forms of standardisation and customisation that can occur in the service domain when the output is knowledge intensive. By including modular approaches (mass customisation) and standardisation with a limited degree of customisation within the broad scheme of service standardisation, our study offers an original contribution to the literature on business services. More specifically, this paper discusses and empirically presents various KIBS strategies that go far beyond the well-established description of customised services offered through interactive collaboration with customers. The paper introduces a new KIBS category named combinatory KIBS and explores how those KIBS behave and perform compared to the traditional typologies of KIBS discussed in the literature and related to the dichotomy of standardisation-customisation approach. Through combinatory KIBS, our analysis sustains a new interpretative framework of KIBS’ offering profiles and characteristics, enriching the debate on KIBS (Muller and Doloreux, 2009) and contributing to opening their black box (Muller, 2008; Bettiol et al., 2011).

Combinatory KIBS combine business service types from customised to industrialised services, creating a different strategic and organisational approach than pure (bespoke or industrialised) KIBS profiles. To meet various customer needs and requests, combinatory KIBS pair customer interaction with the codification of processes and knowledge. Additionally, these enterprises develop a network approach (Evanschitzky et al., 2007), in which collaboration with other firms (particularly other KIBS) enriches their internal competencies and knowledge repertoires to help meet market demand. In line with the theory of ambidextrous organisations (O’Reilly and Tushman, 2004), we can also describe combinatory KIBS as dynamic organisations where exploration and exploitation coexist. On one hand, this KIBS profile explores new market opportunities through direct interactions with customers requesting customised services. On the other hand, combinatory KIBS exploit their learning results through developing more standardised services.

The main limits of our research refer to the fact that it is based on quantitative analysis and it is focused on a single region of Italy (limited sample). Further research should explore in detail through qualitative analysis how combinatory KIBS manage internally and within the network their processes of knowledge management, innovation and service delivery. In particular, future researchers should analyse in depth the link between learning relationships with bespoke customers and knowledge codification aimed at service standardisation. Further attention should also be paid to the profile of combinatory KIBS in order to investigate their entrepreneurial characteristics. Further research could also explore the issue of standardisation-customisation also in relation to other service firms, beyond the KIBS domain. In addition, an international comparative
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study to overcome the limitation of the geographic scope of the present empirical research.

References


