Knowledge Intensive Services’ Suppliers and Clients

Ministry of Trade and Industry
Finland
Studies and Reports 15/2003
Authors
Professor Ian Miles
University of Manchester, UK

Date
November 2003

Commissioned by
Ministry of Trade and Industry

Abstract
This publication is a summary report of studies made in the field of knowledge-intensive business services (KIBS). It has been produced in the framework of an OECD project for studying and developing the use of knowledge-intensive service activities (KISA) in different industrial sectors. The KISA project belongs to the initiatives of the Working Group of Technology and Innovation Policy (TIP) of the OECD’s Science and Technology Policy Committee (CSTP). Australia and Finland are the coordinators of the project which was launched in 2002 and lasts until 2005.

KIBS studies are focused on private companies specialised in expert services. Since 1995 research into KIBS has rapidly increased due to observations of the supporting role of these companies in innovation processes. What is new in the OECD project is broadening the perspective to include also corresponding services in the public research and technology organisations (RTOs) and corresponding in-house services in client organisations. In the OECD project the focus is on activity-level whereas earlier KIBS studies have been more actor-oriented.

The report first reviews the contributions of several academic disciplines to understanding the roles and impacts of KIBS. Various lines of research, especially from economics and geography, converge towards the conclusion that KIBS do have a positive impact on the performance of user firms, sectors and regions. Sociological analysis raises important questions about the formation of professional knowledge and the networks and communities of practice in which it operates. Management studies have begun to examine the ways in which firms can deal with their KIBS inputs.

Secondly, the paper considers the contributions that have emerged from innovation studies over recent years. This literature puts much focus on the relationships between KIBS suppliers and their clients, and notes that there are very different types of relationship established in different contexts. The paper concludes by deriving a number of implications for further research. Also several promising directions for policy do emerge from the paper. The author emphasises the need for dialogues between practitioners, policymakers, and researchers in specific areas of KIBS, their major clients and intermediaries, and innovation and related policy areas. By bringing together different stakeholders, it is possible to share and consolidate understandings of the implications of various regimes of governance of the KIBS-related elements of the knowledge-based economy.

MTI contact: Technology Department/Pentti Vuorinen, tel. +358 9 1606 3748

Key words
knowledge intensive business services, information and communication technology business services, innovation activities, innovation research

ISSN
1236-2352

ISBN
951-739-740-2

Pages
81

Language
English

Price
17 €

Published by
Ministry of Trade and Industry

Sold by
Edita Publishing Ltd
OECD launched in 2002 a three years project for studying and developing the use of knowledge-intensive service activities (KISA) in different industries. The KISA project belongs to the initiatives of the Working Group of Technology and Innovation Policy (TIP) of the OECD’s Science and Technology Policy Committee (CSTP). Australia and Finland are the coordinators of the project.

Earlier studies on the topic have focused on knowledge-intensive service activities supplied in the private sector by companies specialised in expert services. Since 1995, research on these KIBS (knowledge-intensive business services) companies has rapidly increased. Behind the growing research interest lies the notion of the important role KIBS have in supporting the innovation processes of firms. What is new in the OECD project is the aim to broaden the perspective to even include the corresponding services supplied by public research and technology organisations (RTOs) and supplied in-house by the client organisations themselves.

In order to provide a good knowledge base for the KISA project, the Finnish Ministry of Trade and Industry ordered a summary report on the previous KIBS studies by professor Ian Miles. He is one of the leading experts in the field, and he was also one of the first researchers to use the concept of KIBS. During the recent years, professor Miles has extensively studied the role and significance of these services. The report in hand goes through the major lines of KIBS research within different scientific disciplines, and analyses KIBS from the perspective of innovation studies. Especially valuable for the OECD KISA project is, that the report summarises all the main results available from research on the nature of supplier-client relations in expert services so far.

Helsinki, October 2003

Ministry of Trade and Industry

Pentti Vuorinen
Senior adviser
Preface

KIBS are Knowledge Intensive Business Services firms, who are characterised by such indicators of knowledge-intensity as high levels of staff with degrees and professional qualifications. Some KIBS are very much based on scientific and technological knowledge, and these often play a role in technological innovation processes in their clients. Other KIBS are more concerned with such topics as marketing, legal and administrative affairs, finance, etc.: these may provide important contributions to organisational innovation, and can also support technological innovation in many respects. Though neglected until recently, a broad spectrum of analysts now agree that KIBS play important roles in innovation systems.

The paper first reviews the contributions of several academic disciplines to understanding the roles and impacts of KIBS. Various lines of research, especially from economics and geography, converge towards the conclusion that KIBS do on balance have a positive impact on the performance of user firms, sectors and regions. The ways in which this is effected – through knowledge-based activities, for example through KIBS fusing together client- or sector-specific knowledge with more generic knowledge, and acting as agents for diffusion of techniques and good practice, point us towards the concerns of innovation studies. Sociological analysis has been less concerned with the impacts of KIBS, but raises important questions about the formation of professional knowledge and the networks and communities of practice in which it operates. Management studies have begun to examine the ways in which firms can deal with their KIBS inputs.

The paper moves on to consider the contributions that have emerged from innovation studies and related work over recent years. Here there has been considerable effort to grapple with just what it is that KIBS do with their knowledge, and how this is utilised for, and by, clients. This literature puts much focus on the relationships between KIBS suppliers and their clients, and notes that there are very different types of relationship established in different contexts. There are generic, or at least widespread, issues to do with the formation and nurturance of such relationships, with the important role of trust, with the need for KIBS professionals to combine different social and technical skills, and with the requirements for clients to be able to manage the relationships and the inputs they obtain from them. However, the different varieties of relationships are liable to have very different implications for innovation processes and for such issues as the tradability and locational aspects of KIBS.
The paper concludes by deriving a number of implications for further research and directions for policy that flow from these analyses. Though there has been much progress in recent years (much of it scattered across different, and often compartmentalised, literatures), there are many questions that remain to be answered by research. There has been little effort to examine policy innovations directed at KIBS and their clients, and the task of accumulating information on these has barely begun.

Nevertheless, several promising directions for policy do emerge from the paper. But above all, the suggestion is that policy dialogues are required. These should bring together practitioners, policymakers, and researchers in specific areas of KIBS, their major clients and intermediaries, and innovation and related policy areas, so as to share and consolidate understandings of the implications of various regimes of governance of the KIBS-related elements of the knowledge-based economy.

Ian Miles
Professor

University of Manchester
United Kingdom
# Table of contents

**Foreword** .......................................................... 5

**Preface** ............................................................. 7

**Contents** ............................................................ 9

1 **Introduction: KIBS in Context** ................................ 11
   1.1 The role of KIBS ................................................. 11
   1.2 Knowledge-intensity ............................................ 12
      1.2.1 KIBS as the focus of the study ....................... 16
      1.2.2 A note on other knowledge intensive activities .... 17

2 **Some Major Lines of Research** ................................ 20
   2.1 Economic analysis .............................................. 20
      2.1.1 Information asymmetries and transaction costs ..... 20
      2.1.2 KIBS growth .............................................. 22
      2.1.3 Economic performance .................................. 23
   2.2 Geography ...................................................... 27
   2.3 Sociology ...................................................... 31
   2.4 Management studies .......................................... 35

3 **Perspectives from (Services) Innovation Studies** ....... 41
   3.1 Innovation surveys ............................................ 41
   3.2 Knowledge as a focus ........................................ 42
      3.2.1 Knowledge interactions ................................ 42
      3.2.2 Knowledge management in KIBS ..................... 49
      3.2.3 Knowledge infrastructure .............................. 55
   3.3 Supplier-client relationships ............................... 57
      3.3.1 Sparring and jobbing relationships .................. 57
      3.3.2 Location and proximity issues ....................... 60
      3.3.3 Client roles ............................................ 62
4 Conclusions ...................................................... 69
  4.1 A first point ...................................................... 69
  4.2 Human resources .................................................. 70
  4.3 Regional issues and SMEs .......................................... 73
  4.4 KIBS as a critical sector ........................................... 74

Bibliography .............................................................. 75
1 Introduction: KIBS in Context

1.1 The role of KIBS

Knowledge Intensive Business Services (KIBS) are among the fastest growing and dynamic sectors of the economy (c.f. Table 1). They contain many innovative users of new technologies, especially Its; and they provide considerable potential for future employment growth. They play a role in improving the competitiveness of enterprises (and the quality of public services) throughout the economy. They form important intermediaries and nodes in innovation systems. Through innovation support and outsourcing of services, they can improve quality and help adapt production structures to the challenges of the knowledge-based economy.

But while policy attention is beginning to be focused on KIBS, the statistical picture remains very underdeveloped, and there is very little comparative appraisal of policy measures aimed at the sector and its use. The interrelationships between KIBS and other economic activities remain very poorly understood. The available literature is very scattered. For example, management research has examined the role of business services in outsourcing enabling enterprises to concentrate on their core competencies. Innovation researchers and regional geographers have examined the role of business services in innovation networks and in the diffusion of knowledge. Studies of knowledge management and intellectual property systems have examined how business services tackle these issues. Economic analyses have related the growth of KIBS to structural change in the economy, and sought to estimate the performance impacts of KIBS use. This paper seeks to bring together elements of this scattered literature.¹

So what are KIBS, and how do they relate to Knowledge Intensive Services and Service Activities more generally?

---

¹ A number of projects under the framework of the EC’s TSER programme have undertaken relevant activities and reviews. These include the projects KISINN, RISE, SI4S, and TIPIK, details of which can be found on the cordis.lu website.
Table 1. Business services, labour productivity and employment growth, average annual growth rate (percent)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labour productivity</td>
<td>Employment</td>
</tr>
<tr>
<td>EU6-81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renting and other business activities</td>
<td>0,3</td>
<td>2,6</td>
</tr>
<tr>
<td>Of which: - Renting of machinery and equipment</td>
<td>3,0</td>
<td>-1,2</td>
</tr>
<tr>
<td>- Computer and related activities</td>
<td>3,8</td>
<td>2,8</td>
</tr>
<tr>
<td>- Research and development</td>
<td>0,0</td>
<td>0,6</td>
</tr>
<tr>
<td>- Other business activities</td>
<td>-0,6</td>
<td>2,9</td>
</tr>
<tr>
<td>US</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renting and other business activities</td>
<td>-1,1</td>
<td>3,9</td>
</tr>
</tbody>
</table>

1 EU estimates obtained using sectoral employment weighted averages of country growth rates.

Source: Netherlands Economics Institute calculations, based on OECD STAN data

1.2 Knowledge-intensity

All economic activities involve deployment of some human knowledge, of course. A pragmatic approach to “knowledge-intensive activities” is to identify these with activities founded upon knowledge that is both highly specialised and, typically, learned through a professional process involving the acquisition of understanding of fairly abstract principles. Usually this process involves formal education, though it may be experience-based (especially in the case of new professions – though these typically enlist people who have already displayed capacity for such abstract learning in formal higher education). Some business services are not knowledge-intensive in this way: low status, poorly paid, and often poorly educated workers form the bulk of those employed in many branches of cleaning, catering, security, transport, etc. But KIBS employees tend to have high levels of social and institutional knowledge involved in many of the traditional professional services), or of more S&T-related knowledge. (There are many blurred boundaries here, though: for instance logistics services may both provide transport and undertake extremely knowledge-intensive activities in the organisation of transport.
arrangements for clients. New S&T-related KIBS may emerge from professional services: for example, it is common to find firms emerging to supply software and other products to clients and/or other firms in their sector.) The staff profile of KIBS includes many people with higher education and professional qualifications. This is one indicator that we are dealing with a specialised KIBS, rather than a service concerned with routine solutions to common problems – such as transport and logistics, mass entertainment, postal and telecommunications infrastructure services (much of what such services do is not routine – but a large share of the effort of their workforce is being expended in routine ways).2

Evidence as to the knowledge-intensity of different economic activities can be gleaned from various sources, and Figure 1, below, uses the results from the most recent UK Community Innovation Survey (CIS-3). This allows us to examine the share of graduates of two kinds – Science, Engineering and Technology graduates, and other graduates – in the workforce of firms responding to the survey. The data have been processed by Bruce Tether, of CRIC. They confirm that KIBS are more knowledge-intensive than other sectors (by this indicator) and suggest that there are clusters of KIBS relying (a) mainly on “other graduates” and (b) also on S&T graduates. This corresponds to a familiar distinction in the KIBS literature, between technology-oriented and more professional and administrative KIBS.

2 A potentially interesting line of enquiry is to examine the share of R&D or other innovation-related staff among the senior echelons of such companies, rather than as a proportion of the total workforce. This might help us distinguish those companies that are innovative and deploying new knowledge in strategic ways, as opposed to those that are simply big.
Source: calculated from CIS-3 data by Bruce Tether. Data are averages of firms’ responses, not sectoral grand averages. ITS = IT services; TS = technical services; PS = professional services; FS = financial services; WHS = wholesale; TRS = transport services, EXT = extractive industries; CON = construction; the remaining four sectors are high, medium high, medium low and low-tech manufacturing.

Figure 1. Employment of graduates by service firms in the UK
We can see KIBS in general as problem-solvers. Some traditional professional services deal with problems associated with social systems and institutions, especially administrative rules and regulations (e.g., legal and accountancy services). Less formally governed problems concerning social groups and interests are at the heart of many marketing and issues consultancy services, for example. Other services support interorganisational activities (supply chain management, etc.). Some KIBS have more of a focus on psychological and biological problems, as with medical and veterinary services, educational and clinical psychology and psychiatry, counselling, etc. Others are more concerned with the physical world - for example, engineering services concerned with construction systems or transport infrastructure; laboratory testing and research services concerned with the properties of materials, chemicals, devices; and IT services of various kinds concerned with symbol-processing or with the configuration and integration of discrete items of hardware and software. The S&T-related KIBS especially may play a strong role in diffusing new materials and systems to their own clients.

Some KIBS are hard to locate as being either S&T-based or more traditional professional services. This is particularly true in fields such as architectural and design services. Here we find many firms carrying out quite routine work, but others who combine aesthetic creativity with technological innovation – or at least with a frequent search for new technologies that they can exploit. KIBS may become involved in their clients’ technology strategies (e.g. the many professional service firms in accounting and management consultancy who have developed capabilities in IT consulting for clients). Some KIBS in traditional professional service sectors develop strong competencies in technology-related fields. For example, some lawyers specialise in IT in patent law, some financial advisors and market analysts become expert in high-tech or consumer innovation fields. It is particularly useful for many KIBS in processing their information, and they become users of Computer Aided Design packages, systems to transmit rapid intelligence updates to clients, etc.

Other KIBS more evidently feature technology as their core activity, as is reflected in the high levels of Qualified Scientists and Engineers typically present in their workforce. Such technology-related KIBS have important roles to play in innovation processes (cf. Miles et al [1995] and Bilderbeek et al [1998]). There are services that actively conduct research and development into new technologies – R&D services, by the turn of the millennium, were accounting for 10% of business R&D in the UK. Closely allied to these are services that perform testing of various sorts (often for conformance purposes). A rather different sort of testing is performed by rapid prototyping services, which construct models or full-size versions of designs so that, for example, difficulties with the production process or
finished device can be identified. Some services are directly providing technology support for clients confronted by needs to engage with new technology – examples include Web and Internet, software and computer services, and equivalent services emerging in the biotechnology sphere. One particular form of support includes training of staff to make use of new systems, while strategic advice may be given as to the choice and implementation of new process technologies. Facilities management services actively handle the task of using the new technologies for the client – managing a “smart building”, running a call centre or outsourced computer network, etc.

Recent analyses of European Community Innovation Surveys confirm that KIBS sectors, especially technology-related ones, are among the most active innovators in the economy. (Tether et al, 2001). This is despite evidence that service sectors on average lag slightly behind manufacturing in terms of reported innovation (54% of manufacturing enterprises, 46% of services reported innovative activity. But the IT-intensive financial and telecommunications sectors have high levels of innovation (58%, 68% respectively), along with computer (72%) and technical services (67% – this group includes architectural, engineering and technical services, but surprisingly excludes R&D, technical testing and analysis together with legal, financial or management consultancy). Though few innovating services conducted R&D in general, it was very common amongst computer and technical services. Such KIBS are more like high-tech manufacturing than they are like other services.

The term quarternarisation has been used (e.g. in the European Competitiveness Report 2000) to describe the steady rise of information and knowledge-based services. The phenomenon of increasing shares of knowledge-based services in the intermediary inputs of the total economy, and for broad sectors can be clearly observed from analysis of input-output data. This differs from traditional growth in services in that these knowledge-based services can play important roles in innovation and productivity growth for the rest of the economy.

1.2.1 KIBS as the focus of the study

This essay focuses on the development of KIBS, and on efforts to understand their relations with their clients. Other types of knowledge-intensive service, and

---


4 See Tomlinson, M. (1997) and several subsequent papers.
business service, accordingly receive very little attention in what follows, and often such attention as they are given is merely a consequence of their being collapsed together with KIBS in data or analyses we are reviewing. Knowledge-intensive service activities within firms, however, receive a little more attention. They are not the focus of the study, but are important to the analysis of KIBS in two ways. First, they reflect the make-or-buy, market-or-hierarchy, internalisation-versus-externalisation, in-house-versus-outsourcing (etc.) dynamics that play a role in KIBS development. Second, they are important in that the utilisation of KIBS inputs into firms, and indeed the definition of what these inputs should be, will often relate to the “absorption capacity” of the clients, which is in part a matter of their internal knowledge-intensive service activities.

1.2.2 A note on other knowledge intensive activities

This essay is mainly focused on the literature about KIBS. However, it should be remembered that not all Knowledge Intensive Service Activities (KISA) are supplied by KIBS. Some are supplied by public sector organisations, such as public laboratories, Universities, government agencies. Some are supplied by firms that are in the main not service firms. Many services are supplied on an in-house base to “clients” within the company. Furthermore, manufacturing firms often supply services (mainly, but not always complementary to their material products) to their clients, and non-knowledge-intensive services may supply KIBS-type outputs to their clients (usually services complementary to their main service products).

Some Knowledge-Intensive Service activities are carried out on an in-house basis for their parent organisations, and do not supply any KIBS for third parties. And some Knowledge-Intensive Services are supplied mainly to final consumers, as public services (e.g. health) or private professional ones (consumer financial advice or computer repair). KIBS mainly service private businesses, or supply similar types of service to public organisations (this forms a very important source of business for them in some countries).

Services are increasingly evident elements of many productive activities. In part this represents a division of labour within organisations similar to that occurring across organisations when KIBS emerge as specialised firms. KISA which were earlier “invisible” parts of the bundle of activities comprising another job have been differentiated into specialised occupational roles and even parts of the organisation. But also, new KISA emerge to meet requirements associated with technological and organisational change and the challenges of changing business environments. The value-chain of economic activities that are embodied in final and intermediate
industrial products thus features a growing share of KISA, as reflected in the growing share of qualified professionals in effectively all economic sectors, as well as in the growth of KIBS.

Service activities (in-house or purchased) in general constitute the greater part of most companies’ costs: even for manufacturing firms, more than two-thirds of all costs (other than materials) tend to be indirect or overhead expenses, most of which are services that the company is supplying internally. Within manufacturing, 75% to 85% of all value-added involves service activities: the actual production of physical goods constitutes only a small part of the overall value. For instance the direct physical manufacture of computers accounts for only 10% of the ultimate price in the computer industry; the largest share of costs involves design, software development, distribution etc. Quinn proposes that value added is increasingly likely to come from technological improvements, styling features, product image, and other attributes that involve service functions and, often, specialised service firms and/or employees. Services’ contribution to the process of value adding is growing, and this will continue if demand for differentiated and individual products continues to increase.

Companies in all sectors generate services for their own use. But they may also supply services to their clients. The sale transaction is only a point in a chain of events, many of which involve services. Mathé and Shapiro distinguish between essential services (which must be provided for the firm to continue to exist) and amenities that are not necessary for the product to function but which add to its utility (and to the firm’s differentiation and competitive edge). They also distinguish services which encourage or facilitate the sale of products – Public Relations, demonstrations – from those which increase the benefit or satisfaction from use of the product – after-sale repair and maintenance, pre-installation customisation, rush delivery, specialised training, product updates, helplines, etc. Likewise, service components are integral to product innovation. For instance, the process of upgrading products, i.e. creating increasingly differentiated, high quality production, aimed at the specific needs of market segments, depends upon these service functions.

There is a common argument that both in industrial markets and in consumer markets, the service elements surrounding the actual material product are a major focus of competition. The suggestion is that in many sectors, competition is shifting away from how companies build their product to how well they serve customers

before and after they produce and sell the products. Thus, Mathé and Shapiro (1993) cite studies indicating the important role of service elements in manufacturing (especially of high-tech products). For example, one survey of field service managers in high-tech equipment firms found that service quality scored highest among customer concerns. (The next most important attribute was reputation, followed by product quality.) Another survey found that German managers considered that the competitive significance of service elements was growing and would expand substantially over the next 10 years. They also cite case studies, such as the example of how Dutch flower-growers gained advantage over French competitors by having analysed delivery constraints and developed innovations to overcome these. (The innovations included: computerised order-taking, grouped orders, organisation of delivery itineraries and use of shop keys to enter the shops and deposit the flowers before opening.) They also offered new services (ready-to-sell bunching at the flower “factory”) and they guaranteed stable prices.

The argument about the growing role of services applies equally well to KISAs – indeed, many of the examples cited are cases of knowledge-intensive activities. The suggestion is that firms in all sectors, including manufacturers, are increasingly deriving competitive advantage from knowledge-intensive service processes associated with their core activities (be these service or material production). Somehow the knowledge-intensive activities are leading to greater demonstrable value for the customer. This, of course, is the argument about the coming of the knowledge-based economy. The growth of KIBS is often taken as one major manifestation of this new, emerging, socioeconomic formation.

---

6 Chase & Garvin (1989).

7 This is based on the formulation set out by Quinn et al (op cit). For a lengthy exposition of “The Service Edge”, focusing on customer service in 101 US companies – including both manufacturing and service firms – see R Zemke (1990).
2 Some Major Lines of Research

This section of the essay will review a number of literatures generated by academic disciplines. Some of these have explicitly tackled KIBS, others have made relevant contributions without taking up the concept. Some approaches have little to say about processes, but do consider their outcomes; others are effectively the converse.

2.1 Economic analysis

2.1.1 Information asymmetries and transaction costs

Economics has notoriously had little to say about knowledge and knowledge-intensity, though current discussions of the knowledge-base economy may change this. One economic concept that is very relevant to the analysis of KIBS is the notion of “information asymmetries” – that the parties in an economic transaction may possess very different degrees of information about the product that is being traded. This is particularly true for many service products, which cannot readily be demonstrated prior to production and consumption.

Such issues are confronted in the case of KIBS. De Bandt (1995) noted five types of information deficit on the part of the client. First, it can be hard to establish the KIBS’ competence and experience in dealing with relevant problems. Second, the client may not be able to accurately assess the kind or level of skills required to deal with the specific problems it faces, nor to match these to the KIBS’ offerings. Third, the highly specific and complex nature of the service can make it hard to agree on the precise services to be rendered, or criteria for assessing their quality. Fourth, estimation of the effort required of the KIBS in supplying the service can be difficult. Finally, the impact and effectiveness of the service provided by the KIBS may be affected by many factors (some internal to the client, some red to unpredictable external circumstances) such that it is hard to determine the KIBS’ responsibility for any problems arising.

We shall return to such issues below, when discussing the nature of KIBS-client relationships. Suffice it to say, for now, that the question of trust is a significant one in such relationships.
Another line of economic analysis concerns the notion of transactions costs, elaborated by Williamson. He (and many followers) argue that organisations’ decisions as to whether to internalise functions (to produce them internally, through their own hierarchical structures) or to externalise them (to buy them from outside contractors) are not just a matter of production costs. They are also in part a function of transaction costs. These are “…comparative costs of planning, adapting, and monitoring task completion under alternative governing structures (Williamson, 1981, pp. 552–553).” Three transaction cost criteria are asset specificity (are specialised investments required to perform the function?), metering (how readily contractors’ attainment of the specifications of the contract can be monitored and measured), and frequency of contracting (how often there will need to be subsequent rounds of bargaining after a first contract has been let). The asset specificity of many KIBS services – requiring investment in specialised knowledge – is a factor behind externalisation of these functions. (Furthermore, we could add that the independence of the KIBS firm may be an important source of legitimacy within the client and for other parties whose information and co-operation is required.) However, metering is a challenge (we turn to efforts here in a subsection on “client roles” below); and the nature of many KIBS services also requires long-term relationships (e.g. it takes time to establish trust, there are steep learning curves in understanding the client organisation, etc.). Transaction cost analysis provides a helpful terminology for examining the use of KIBS, but the complexities of the business relationships here are hard to deal with in the formal ways required by the approach. (That being said, Brown & Potosk (2001) have shown the possibilities of statistical analysis of government decisions about service provision, within a transaction cost framework.)

Let us turn to more empirical economic analyses. Two lines of literature are particularly relevant here. One examines the growth in KIBS, and one attempts to identify their impacts on clients via examination of macrostatistics. The data used in these two bodies of literature are both predominantly based on input-output analysis. While analysts interested in these lines of work have come from various backgrounds, quite a few of the economists active here have a longstanding involvement in innovation studies and related topics (e.g. the rise of the knowledge-based economy). This tends to place them outside the mainstream of economic analysis, which has tended to avoid the challenging problems associated with treating information and knowledge as if they were conventional economic commodities.
2.1.2 KIBS growth

One line of work concerns explication of the growth of business services in national economies. Several analysts have used input-output tables (IO tables) to examine this development, since these tables allow us to capture the producer service roles of “mixed services” that supply consumers as well as producers. And many other service branches make a contribution to other industrial sectors. Though IO tables are relatively poor at discriminating among services in fine detail, they do allow for some comparative and time-series analysis. Thus in a fairly early study, Barker (1990) used examined the factors involved in change in UK services, comparing input-output data for 1979 and 1984. Intermediate demand was found to account for over one-third the demand for marketed services in the UK, up from less than one-quarter in the early 1970s.

Barker discusses five large groups of services: (1) business services (banking & finance, insurance, and business services, hiring & real estate) – this contains most of our KIBS, (2) transport, (3) communications, (4) distribution & repair & hospitality services, and (5) other services. IO data is used to estimate how far change in output reflects different sources of demand. The first major class of change is changes in input-output coefficients – increasing intermediate consumption due to a growing contribution of services per unit of final output (as opposed to those elements of growth due simply to expansion of final output in those sectors utilising intermediate services). The second is change in final demand itself. Due to a decline in UK manufacturing over the period, growth in use of producer services due to final demand for manufactures was actually negative. This was (slightly) more than compensated for by increasing reliance on services inputs per unit of output. Services are themselves major consumers of producer services, and both demand growth and changes in input mix contributed to a substantial growth in use of producer services. This pattern may be different in other countries – for instance Carlsson (Karaomerlioglu & Carlsson, 1999) has argued that most producer services growth in the US reflects the requirements of manufacturing. Taken together, manufacturing and business services comprised 54.6 percent of GDP in 1977. This was only a small decline from the 51.6% figure for 1990, which leads him to argue against fears of a tremendous decline in US manufacturing strength (however, many business services do serve other services, so the case should not be overstated).

Table 2 presents some of Barker’s results. He notes the outstanding effect of changes in input-output coefficient for business services’ growth (larger than the effect for services as a whole). In the period 1979–84 the output of these services rose by 37 % (ten times more than GDP growth). Most of this reflected change in
coefficients – shifts in economic activity which increase the demand for these services as contributors to final products. In other words, KIBS are becoming more significant elements in the activities of the whole economy. Table 3 demonstrates that business services also contribute to other services’ activities in the Dutch economy.

2.1.3 Economic performance

Several studies have used macro-data to throw light on the relations between KIBS use and the economic performance of these users. These studies work with statistics representing economic sectors, and the hypotheses tested are that there is a correlation between the use of KIBS inputs across sectors (given from IO data) and the performance of these sectors. (Thus what is tested is the notion that sectors whose firms have a high level of KIBS use are sectors with better than average performance – though we can only infer that this performance actually derives from the KIBS-using firm.) Measures of performance may be such indicators as growth and productivity growth rates. We consider two variants of this approach below.

A cluster analysis of service inputs

Peneder et al (2001) seek to assess the effects of external service inputs on the performance of EU manufacturing. They use statistical cluster analysis methods to develop a taxonomy of (manufacturing) sectors based on their use of different service inputs. However, the data source employed for this is US IO tables for 1992, due to the lack of precision of large-scale EU data sets. There is a rather bold assumption

---

8 The issue here is how KIBS contribute to the performance of their users – not how the performance of KIBS contributes to the average performance of all economic sectors. Baker et al (2002) provide an example of the latter type of approach. They analyse the labour productivity growth in market services for 9 EU Member States, the USA and Japan, and also calculate the contribution made by market services to aggregate labour productivity performance. The OECD’s STAN database provided the data used here. The researchers depicted a low rate of (measured) productivity growth and strong employment growth in business services. Divergent trends seemed to emerge in the EU and US – the EU’s superior performance in the earlier period (in employment and especially in productivity growth) is overtaken by that of the US in subsequent years. This finding is now fairly well known (and much argued over) for the economy as a whole. If reliance can be placed on the data (and there is a strong line of critique of the adequacy of productivity indicators for services) it raises the question of how these services’ performance is affecting their contributions to their clients, and thus their clients’ performance.

that the sectoral pattern of consumption of KIBS is similar in Europe and the US. (An “eyeball” appraisal of the picture tends to support this in broad terms, but it would be useful to test the claims against data for large EU member state economies.

**Table 2. Sources of output growth in UK marketed services [£ (1984) million]**

<table>
<thead>
<tr>
<th></th>
<th>Distribution</th>
<th>Transport</th>
<th>Communications</th>
<th>Business services</th>
<th>Other services</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value in 1979</td>
<td>67 912</td>
<td>24 839</td>
<td>8 221</td>
<td>46 127</td>
<td>12 815</td>
<td>129 915</td>
</tr>
<tr>
<td>Value in 1984</td>
<td>70 444</td>
<td>23 610</td>
<td>10 171</td>
<td>62 103</td>
<td>14 160</td>
<td>180 487</td>
</tr>
</tbody>
</table>

**SOURCES OF CHANGE — effect due to:**

(a) change in input-output coefficients
   -3 706
   752
   1 090
   16 981
   819
   15 935

(b) final demand
   -1 982
   859
   -1 004
   1 735
   4 636

**CHANGE WITHIN FINAL DEMAND — effects of:**

(a) growth
   -385
   467
   -122
   -443
   1 344
   -350

(b) effects of mix
   -2 449
   981
   -561
   391
   4 986

Source: Barker, 1990, Table 7.

**Table 3. The supply of producer services to Dutch industry, 1969–1986, (thousand million DGL )**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>28,1</td>
<td>48,1</td>
<td>69,1</td>
<td>79,6</td>
<td>283</td>
</tr>
<tr>
<td>Trade</td>
<td>5,9</td>
<td>10,7</td>
<td>17,1</td>
<td>23,1</td>
<td>392</td>
</tr>
<tr>
<td>Transport &amp;</td>
<td>4,9</td>
<td>9,0</td>
<td>15,1</td>
<td>17,9</td>
<td>365</td>
</tr>
<tr>
<td>communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial services</td>
<td>3,3</td>
<td>9,4</td>
<td>19,4</td>
<td>23,6</td>
<td>715</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2,5</td>
<td>6,7</td>
<td>14,3</td>
<td>19,7</td>
<td>788</td>
</tr>
<tr>
<td>services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bilderbeek & Den Hertog (1992, Table 1.1) based on Dutch National Accounts data processed by INRO-TNO.
Individual manufacturing industries in the EU were clustered into groups sharing similarities with respect to use of KIBS and other inputs. 4 clusters of industries were distinguished:

• high inputs of transport services
• high inputs of retail and advertising services
• high inputs of knowledge-based services
• other industries.

The analysis tended to reveal higher productivity and higher growth in value added for the third group of manufacturing industries in the EU. Lower declines in employment, and greater quality differentiation (lower price competition), were also noted for industries with high inputs of knowledge-based services.

As noted, it would be valuable to extend this work with European clustering data; not least to see how far EU patterns of KIBS use correspond to those in the US. It might be hypothesised that stronger relations should be found where locally validated clusters are identified and employed. Service sectors might also be included in the cluster and subsequent analysis.

But the general thrust of the data analysis tends to support the view that the use of KIBS enhances the performance of those sectors that consume more of them. The same conclusion is reached from a rather different set of IO approaches.

Econometric estimations

Several recent studies use IO data in production function analyses. Antonelli (2000) argues that KIBS contribute to innovation and thus to performance by enabling information flows that support learning and adaptation. (In addition to the classic tools for increasing innovation and absorption capacity of in-house R&D etc.). Two types of KIBS were differentiated (reflecting this emphasis on information flows): communication services and business services. The rates of growth in the use of these two types of knowledge service should be associated with increasing productivity among their users (again, at a sectoral rather than firm level). IO data for a number of European countries (Italy, UK, Germany, France and the Netherlands) was tested, and demonstrated that in all five countries. The use of business and communication services was correlated with their rate of growth. (See Box 1) The correlation with use of communications and business services taken together was statistically significant for most countries (weak results for Germany and the Netherlands). In analyses that only included either business or communication services, the results for the Netherlands were again weak, while the
other countries show a significant effect. Tsounis (2000) effectively replicated Antonelli’s approach with Greek data, finding similar significant results.

The production function approach raises theoretical problems associated with the construction of aggregate production functions containing capital. It is also difficult to find quality data on consumption of fixed capital (and/or vintage of capital from which consumption of capital may be estimated).

Tomlinson (2000) uses a slightly different approach to the same problem, examining UK (1979, 1990) and Japanese (1980, 1990) data. Instead of a conventional production function he examined the interaction of labour with material and non-material intermediate “goods”. Output is thus seen as being yielded by labour, acting upon intermediate physical goods and/or using knowledge and information.

In Japan the contribution of KIBS (to productivity and output growth) was found significant at both periods, and in the UK in the more recent period only. This is an intriguing result, given that the KIBS sector in Japan begins from a substantially smaller base than that of the UK: among other things, its suggests that there remains much to be done in exploring and explaining the role and contribution of KIBS in different national economies.

---

**Box 1 Equations used in estimating the impact of KIBS from input-output data**

Antonelli Model (see text):

A technology production function was calculated for each country in which

\[
\log Y = a + b \log K + c \log L + d \log CBS
\]

where

- \( Y \) = value added
- \( K \) = capital stock
- \( L \) = labour costs
- \( CBS \) = flow of communications and business services

Tomlinson model (see text) \( Q \) (gross output) is seen as a function of \( ML \) and \( BL \). \( M \) is the quantity of intermediate material goods purchased. \( B \) is the quantity of KIBS purchased by each sector. \( L \) is labour inputs, as represented by the wage bill of the sector.

\[
Q = A (ML)^a (BL)^b
\]

where \( A \) is a constant, and thus

\[
\log Q = \log A + a \log M + b \log B + (a + b) \log L
\]

and coefficients \( a \) and \( b \) are to be estimated.

---

10 Harcourt and Laing (1971); Steedman (1979).

11 Typically the capital stock, rather than consumption of capital is used, where this is itself estimated from investment data and assuming some (fixed) pattern of depreciation.
Tomlinson has gone on to show the impact of KIBS on sectoral performance on other economies, including developing ones. These lines of research are extremely interesting, and D Enterprise is funding a study in 2003 which will seek to push forward such research for a wider range of EU countries, using more detailed data. However, the limits of the data and the statistical analytic methods mean that such approaches need to be complemented, at least, by other methods. They can play an important role in convincing sceptics of the role of KIBS and the variations that this displays over countries and time, as worthy topics for scholarly and policy concern. But IO data restrict us to the sectoral level, and arguably the relations between KIBS and their clients portrayed here are products of factors that remain hard to explore at this level – functional and structural differences in industries associated with their core production processes, their size structure, and so on.

2.2 Geography

Geographers have been some of the earliest analysts of the growth of KIBS. Their approach often reflects concerns with the contribution of KIBS (or producer services more generally) to regional economies – fuelled in part by worries that more peripheral regions might be missing out on the benefits of KIBS (since these tend to be located round core metropolitan areas). There were many case studies of business services’ role in regional development associated with the EC’s FAST programme in the 1980s, for instance, and a long stream of studies addresses the subject from a variety of approaches. For example, Hansen (1994) indicates that the growth performance of the economies of US cities is related to the size of the KIBS sectors in these economies.

Other work examines the challenges posed by the growing importance of KIBS, with the regional perspective leading to a concern with the implications of this for more peripheral regions. Are they disadvantaged by relative lack of access to the knowledge possessed by KIBS? The European Commission’s KISINN project (1998) argued that the problems of some sectors, or small and medium sized enterprises (SMEs), and regional development may be intensified by the strong polarisation of access to KIBS. It stressed that KIBS can be sources of knowledge as to international best practice and the experiences (and markets) of other regions, and that such knowledge is extremely strategic. Wood (1998) further notes that consultancy markets remain localised in the EU: over two thirds of clients use consultancy offices in their local region, and well over 90% in their home countries. Clients may require knowledge and experience of national and international technical and management standards and practice; but they also require a ‘local’ presence to work closely with them (he also notes a dynamic applying to KIBS
firms, associated with this need for proximity: transnational KIBS seek to gain access to local expertise, by acquiring or subcontracting work to national or regional firms).

Muller & Zenker (2001) take up this analysis, arguing that access to local KIBS will be particularly important to SMEs. In a substantial survey of KIBS and their clients in regions of France and Germany, they found higher levels of reported innovation and expenditures on innovation-related activities among manufacturing SMEs who interacted with KIBS than among those who did not. Interestingly, the converse was also found to apply: KIBS that engaged in such interactions were also more innovative (Figure 2).

While it is always problematic to determine causality from such analyses, the study does provide strong statistical evidence that interacting SMEs and KIBS are more oriented towards innovation than their non-interacting peers. Interregional comparisons in this study also suggest substantial regional differences – in the nature and performance of the SMEs and KIBS, and in their innovation and interaction performance. Additionally, national differences appear to characterise the French and German firms: there are presumably issues to do with the influence of national innovation systems on the SMEs and KIBS, and their propensity to interact. These issues are not yet well-understood, and will need to be taken into account in any formulation of policy that seeks to boost innovation and regional innovation capacities by support of KIBS.
Figure 2a. Results from Muller and Zenker on KIBS-SME interactions
Figure 2b. Results from Muller and Zenker on KIBS-SME interactions
2.3 Sociology

In contrast to the economic approaches, sociological studies are typically less concerned with the impacts of KIBS on economic performance than with more traditionally sociological issues. They thus pose questions about the nature and functioning of KIBS and the KIBS-client relationship that have to do with social relations, power structures, the origins of categories, and the like. Relatively few sociologists have actually sought to grapple with KIBS, and the construct “KIBS” is rarely used by them. But there are several lines of relevant sociological research, for example those that raise issues of the social structures involved in professional knowledge systems, the operation of markets for “knowledge workers”, and the role of knowledge-based organisations in social networks.

Professionalisation

The literature on the emergence and consolidation of professions is one fruitful field to consider, with useful pointers to the formation of professional and disciplinary enclaves which have trouble communicating with each other. Some KIBS are prone to this problem (with their own jargon, etc.) – but others can be seen as specialising in bridging such gaps, as translating knowledge for other parties. Abbott (1988) sees professions in terms of their practices (we discuss “communities of practice” later). These involve:

- Diagnosis – the process wherein information about the client is taken into a professional knowledge system and assembled into a picture of the client’s problem.
- Inference – problem classification.
- Treatment – the process whereby results are given back to the client and prescriptions are offered.

He goes on to consider the processes by which problems are assigned to specific professions, academic knowledge is generated and integrated into operations, legitimacy is mobilised where clients are reluctant to accept treatment, etc. There are insights here as to when things are organised as external KIBS or as internal

---

12 Abbott notes that “the tasks of professions are to provide expert service to amend human problems” (p 33). See also his intriguing Chaos of Disciplines University of Chicago Press, 2001; this uses fractal analysis as a metaphor for the proliferation of disciplines and subdisciplines, arguing that the same fundamental dichotomies (or other distinctions) tend to be reproduced again and again as the social systems grow evermore complex. The approach can be used for professional systems in general.
activities – there are logics beyond the purely economic at work, for example in the selection of elite consultants. And the differentiation of the professional practice outlined above is reflected in the study of KIBS by the distinction between information, diagnostic, professional and technical consultancy, and physical services outlined in a study of environmental services in the UK (where service firms were found to specialise on one or other function; Miles, 2000).

Table 4. KIBS roles in services and innovation (examples)

<table>
<thead>
<tr>
<th>KIBS Role</th>
<th>Innovation in KIBS</th>
<th>KIBS-related innovation in client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informative</td>
<td>KIBS may innovate in methods of searching for, synthesising, and presenting relevant information. (Examples: use of patent analysis and bibliometric methods in technology watch type of environmental scanning, use of visualisation techniques to represent such results.)</td>
<td>Service may alert clients to scientific and technological possibilities or trajectories – for example, from analysis of underpinning literature, of competitor strategies, of regulatory developments.</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>KIBS may innovate in methods of monitoring and analysing data, and presenting relevant information. (Examples: development of new sensors in monitoring environmental impacts, of computer models for modelling such impacts, of Internet-based communications for accessing data from and delivering results to client, and use of various means for reporting to clients.) Interaction with client in problem definition provides opportunities for mutual learning and even coproduction of innovations.</td>
<td>By clarifying nature of the problem, client’s innovative strategies can be focused more effectively on search for solutions. Interaction with KIBS in problem definition provides opportunities for mutual learning and even coproduction of innovations.</td>
</tr>
<tr>
<td>Advisory</td>
<td>As Informative and Diagnostic services.</td>
<td>Reduce risks of adopting innovations by using service’s superior knowledge of alternative possibilities, prior experience, best practice, etc.</td>
</tr>
</tbody>
</table>

/cont.
### KIBS Role

<table>
<thead>
<tr>
<th>KIBS Role</th>
<th>Innovation in KIBS</th>
<th>KIBS-related innovation in client</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilitative</strong></td>
<td>KIBS may innovate in the service they supply, and in the processes they use to produce it. Thus training services have extended the range of subjects and types of skill they tackle, as well as innovating both in the use of multimedia and in face-to-face instructional settings. Rapid prototyping services are using computer links to exchange designs and results with clients, and new equipment to construct their models.</td>
<td>Reduce risks of implementing innovations by reducing need for (or accelerating process of) learning by doing. Opportunities to learn from a wider knowledge base than provided in-house, and sometimes to experience solutions tried out elsewhere.</td>
</tr>
<tr>
<td><strong>Turnkey</strong></td>
<td>Innovation in the elements of systems being combined together, and in the applications to which these capabilities may be applied. Opportunities to learn from doing in concrete circumstances.</td>
<td>As facilitative.</td>
</tr>
<tr>
<td><strong>Managerial</strong></td>
<td>Specialisation on the service can allow for learning from diverse applications, for specialised innovative efforts. Knowledge-intensive elements may evolve out of relatively routine services as more knowledge of strategic application of services to client functions, beyond the immediate problem, is acquired.</td>
<td>Reduces need for detailed knowledge of service, freeing resources to concentrate on core competencies (though sufficient knowledge to ensure appropriateness of service provision is still required). Increases opportunities to benefit from scale economies and KIBS' innovation.</td>
</tr>
</tbody>
</table>

To elaborate on implications of this sort of approach for KIBS, Table 4 (from Miles, forthcoming) sets out some of the implications of (a slightly different classification of) distinct service functions for innovation, both in the KIBS firms and in their clients. The distinct service roles may seem rather exaggerated, since many firms supply a bundle of such services as a package – and there may be economies in so doing, since the service interaction requires learning a great deal about the client, at least where a non-standardised service is being supplied. But in some KIBS branches – perhaps relating to the evolution of the market and of knowledge about the problems it is addressing – the services are fairly well demarcated across different suppliers.

**Networks, constituencies, and communities**

The bridging functions of KIBS also bring to mind the literature on social network analysis and innovative networks. Key references include: Burt (1992) and Granovetter (1985). Here a useful approach may be signalled by the ideas...
developed by Burt (1992). Burt distinguishes between bridges and structural holes. When a party is a bridge, it connects other parties that lack ties: thus Y may be in contact with both X and Z, though these two are not themselves in contact. Structural holes form potential connections between clusters of parties that are not connected. A “Y” who bridges a structural hole has opportunities for arbitrage, being able to broker gaps in the social structure. Social network analysis is moving from being a fairly abstract mode of appraisal to a tool for investigating empirical situations, and such approaches look to be promising ones for further investigation of the contributions of KIBS in different structural locations to innovation processes.

Other approaches to network analysis and related examination of innovation systems and constituencies may also be rewarding. In addition to the well-known actor-network theory (with its useful ideas about translation and stabilisation of concepts), there is the provocative work on sociotechnical constituencies from Molina and his colleagues.

The term sociotechnical constituency refers to a dynamic ensemble of technical (tools, machines, etc.) and social constituents (people and their values, interest groups, etc.), which interact and shape each other in the course of the creation, production and diffusion of specific technologies. The term “emphasises the idea of interrelation and interaction in technological development” (Molina, 1993: 483). This approach provides a first step toward identifying the types of actor that may have to be brought on board in the transition to new technologies, or indeed in the organisation of technology development programmes. It complements more conventional stakeholder analysis by pointing to the resources and institutional settings that have to be taken into account. The role of KIBS in these constituencies is something that could well benefit from further analysis, since we can identify many cases where KIBS have been involved in important roles in gluing together – and indeed in actually mobilising – such constituencies.

A final approach has proved very popular across a variety of lines of sociological enquiry, including more applied work in knowledge management to more ethnographic studies of specific professions and crafts. Wegner (1998) stresses the role of communities in learning processes through mutual engagement in their shared practices. A community of practice is defined in terms of its joint enterprise as understood and continually renegotiated by its members; the mutual engagements that bind members together into a social entity; and the shared

---

13 Thanks to Walter Powell of Berkeley for drawing these analyses to my attention – I draw on his formulations here.
repertoire of communal resources (routines, artefacts, vocabulary, technique, etc.) that members have developed (Wegner, 1998). It thus involves self-organising groups of people, engaged in broadly the same practice, among who there is regular communication about the activities. Knowledge production is effectively a spill-over of these activities and communications, as the community develops understandings of processes and practices (often “know-how”). It does not necessary seek to codify and disseminate its knowledge into the wider world.

Creplet et al (2001) have shown that such an approach can shed light on KIBS, basing their analysis on a study of consultancy firms. They differentiate between consultants – who bring relatively standardised solutions to the clients – and experts – who handle more complex or novel problems with original solutions. The consultant’s reputation is partly built around the reputation of the KIBS for whom he or she works. It is also underpinned by professional credentials and, of course, the practical demonstration of know-how within a community of practice. Experts will tend to find recognition through publications and more academic means of marking their territory and demonstrating their contributions to knowledge. Creplet et al go on to relate this to the functions performed by different types of KIBS, and to their internal organisation – some providing relatively standardised services and organised hierarchically, others involving much more interpersonal interaction and flexible organisation. The consultant, it is suggested, provides a vector for the development and transfer of knowledge as to best practice, and may thus enhance the daily operation of clients. The expert, in contrast, provides strategic vision, and may effect more long-term change.

**Employment and skills**

A further literature that might be reviewed here, were there more space and time available, would be that concerned with the development and mobility of skilled and professional labour (e.g. the work of Mark Tomlinson).

### 2.4 Management studies

Just as sociological studies ask different questions from those posed by economists, management studies tend to focus on their own sets of challenges. Performance is indeed a concern here, though it is usually performance of the individual unit that is of concern. Power relations and social structures are similarly of interest, but less as a subject of critical analysis than as the substance of instrumental action.
It is common to find the growth of KIBS dismissed as being mainly a matter of outsourcing, of the movement of functions from within firms to external specialised services. However, statistics reveal a parallel growth of in-house and externally provided KISA, and specialised services are often performing new functions. Nevertheless, the make-or-buy decision is clearly implicated in some KIBS use. There is much discussion of “make or buy” decisions in the management literature, especially in the recent proliferating literature on the outsourcing of computer services. Much of this material is essentially guidance as to what the costs and benefits of outsourcing and facilities management are, and suggestions as to the good practice lessons from case studies of these processes.¹⁴

Trade-offs are involved between price, quality, security of supply, management overheads and transaction costs, and the like. Attention to these issues was renewed by the emergence of new firm strategies in the 1980s. There was then more emphasis on focusing on core activities and contracting peripheral activities to others. In extreme notions of the “hollow corporation”, even core production activities might be carried out externally, as long as sufficient control could be retained by managers.

With the extensive growth of producer services in recent decades, attention was paid to the internalisation or externalisation of service functions. This received a boost, in addition to the interest generated by “hollow corporation” – from two independent sources, one technological and one political. The technological source, as so often, was new Information Technology. The rapid pace of change, and radically new requirements for skills, associated with new IT meant a proliferation of many support services. The political source was the desire to reduce government expenditure and labour, by “contracting out” public services – rather like a public sector version of the hollow corporation. (Indeed, the neoconservative phrase “the minimal state” makes the parallel clear.)

Firms in all sectors have been displaying a growing trend towards concentrating on core activities – towards becoming more specialised. In part this reflects the bad experiences of diversification in earlier years, where many companies found themselves owning businesses whose activities and markets they poorly understood. Specialisation need not necessarily mean producing fewer products, since many of the trends toward flexibility and customisation of products mean that many varieties of the core products are produced. The typical situation is that a

¹⁴ A classic review is Lacity and Hirschheim (1993). (Google returns almost 60,000 hits to a query combining the keywords “outsourcing”, “IS” and “lessons”.)
narrower range of products will be produced, though there may in fact be a greater variety of differentiated products within this range.

This trend back to core activities is expressed in the investment policy: the company invests in technologies and areas of knowledge in which it is (or wants to be) genuinely competent. This implies that individual activities are assessed, to establish whether they are core activities – or, if not, whether they should be dispensed with, or, if they provide necessary inputs to the firm, whether they can and should be subcontracted. Not all activities are ones which firms feel happy about subcontracting, and there have been lively discussions about the costs and benefits of outsourcing and facilities management in computer and telecommunications functions. The concept of “strategic outsourcing” has been coined to describe the processes and decisions involved in contracting out activities, which include not only evaluating the role of the activities themselves, but also the reliability and relative cost of suppliers. The wide application of relatively new concepts such as strategic outsourcing and lean production is likely to contribute to a further subcontracting of non-core activities and the externalisation of services. Often this will result in the growth of specialised business services as organisations contracting-out activities to service firms.

Sometimes these service ‘firms’ are actually self-employed individuals, indeed they may even be ex-employees who are made redundant and then taken on as subcontractors to carry out the same work – but with less overhead for the core company. The “hollow corporation” is liable to be surrounded by service firms performing vital parts of its activity: the challenge is one of finding ways of ensuring that the same quality of input is maintained.

An important reason for firms to seek to focus on the core is the desire for high quality production, as quality becomes a key issue in competition (recall Peneder’s conclusion that KIBS consumption was associated with higher quality output, discussed above). Outsourcing also gives rise to greater demands for certification of suppliers to quality standards, as “leaner” firms (and public authorities who are

---

15 For example, a publishing firm may lay off its editorial staff, and then recommission them as self-employed editors to carry out the same task – Butterworth-Heinemann closed down an entire office building (in Guilford, UK) on using this strategy in the early 1990s, for example.

16 Many commentators hail these developments as ones that will be multiplied as new technology allows more people to become ‘telecommuters’, working from remote homes or community offices for distant organisations. There are certainly moves in this direction, but whether they will develop on a large scale will depend in part upon whether ways can be found of empowering remote workers – especially if they are no longer actual employees who can be treated and made to feel like part of the ‘family’ – with the sorts of social support that are common in traditional organisations.
impelled to contract out some of their services) seek assurance that their suppliers will be capable of meeting their requirements (Environmental standards are similarly being promoted to the suppliers of many large firms and public authorities). As a result of these developments, the scope for a varied and, at the same time, a specialised, high quality supply of business (and also many personal) services is increasing. In turn this facilitates the growth of new service firms.

Increasingly specialised services, furthermore, mean more opportunities for the development and application of new service technologies and concepts. Higher division of labour makes it easier to analyse and automate elements of tasks. New technology has made it possible for independent companies to specialise in particular service activities, automate them and create higher value added, at lower costs than all but a few integrated companies can attain.

Paradoxically, service technologies also contribute, to a certain extent, to de-specialisation. As implied by Barras’ “reverse product cycle” account, new technologies often offer possibilities for the development of new types of services (economies of scope) or much more complicated services (Quinn, 1988, p. 335). A topical example of this is banks offering telecommunication services to third parties (Thomas and Miles, 1988). Diversification may also be prompted by regulatory restrictions which are associated with the “liberalisation” or “deregulation” of certain markets – where firms regard themselves as being heavily regulated in their core businesses, they may seeking new products and markets. This applies to some professional services (though the accountancy profession ahd had its fingers burned by consultancy!) and to telecommunications and utilities.

The flattening of organisations is another response to the need to control costs and achieve flexibility and quality. This involves firms (and public sector organisations) “flattening” their hierarchies, by abolishing many middle-layer managerial and administrative positions. Such strategies may substantially reduce the future demand for middle managers and routine white collar workers; but they require lower grade service workers (shopfloor workers, sales and distribution workers, etc.) to undertake more judgmental tasks. This typically involves ‘empowering’ employees by enabling them to carry out sophisticated tasks without long learning curves. There is accordingly some decentralisation of decision-making to lower levels of the organisation, often with the use of IT for decision-support. At the same time, there are efforts to co-ordinate the organisation through integrated information reporting systems. The aim of such approaches is to increase the ‘span of control’, without losing significant detail on organisational performance. Again there is a considerable management literature on these topics,
with authors such as James Brian Quinn providing useful insights as to services. These researchers conclude that forward-looking firms are applying IT and other technologies to achieve services that are both efficient and customised. Software and planning staff assume a key responsibility for guiding the innovation process so that these technologies support the decisions required of the front-office staff. More decisions about product configurations are made at the local level, within these new frames of reference. The “flattening” of firm structures, means that information on operations is rapidly processed and fed to senior levels of management, rather than proceeding slowly through a many-layered management chain.

Knowledge workers and management

A further literature that might be reviewed here, were there more space and time available, would be that concerned with the MANAGEMENT of professional workers (e.g. the work of William H Starbuck – cf Starbuck 1992). The main problem confronting “knowledge management” appears to be the conflict between companies’ seeking to control their intellectual assets, and professional workers seeking to maintain their autonomy and own sources of reputation. The literature on knowledge workers – and that on the political economy of information systems - is worth examining here, but cannot be addressed in this paper.

18 Quinn op cit. goes on to discuss several types of firm organisation and strategic issue that arise from these developments.
Figure 3. Knowledge Roles of KIBS
3 Perspectives from (Services) Innovation Studies

3.1 Innovation surveys

We have cited some CIS2 results as to the nature of KIBS themselves above – soon internationally comparative CIS3 studies will be forthcoming. Other survey instruments have been able to examine certain features of KIBS in more depth.

Many accounts of the specificities of services stress the importance of close interaction with clients. A German survey of service innovation allows one facet of this to be studied: it asked firms how far their activities were standardised, as opposed to being customised to the requirements of specific clients. Hipp et al’s (2000) data analysis suggested that technology-related KIBS were especially likely to produce specialised service outputs: 27% of Technical Services, and 18% of Software firms, reported more than a third of their output being specialised. (Comparable figures were 4% for Banking and Insurance [but 18% for Other Financial Services], 5% for Trade and 2% for Transport and Communication, 10% for Other Business Services and 4% for a Residual category.) Overall, smaller firms were also more likely to be more specialised. Firms that provided partially-customised or specialised services, too were more likely to report undertaking innovations than were Wholly Standardised service providers (controlling for features such as size). And while one third of the Wholly Standardised innovators claimed that their innovation(s) had an important impact on their users’ performance and/or productivity, over 60% of the Specialised and Intermediate firms thought this to be the case.

The implication is that the latter firms are adapting more of their outputs to suit specific clients; that they have better understanding of client features and requirements; and that they build this understanding into their services to benefit the clients. It looks like firms who adapt more of their outputs to suit specific clients’ needs, have, and are able to act effectively on the basis of, superior understanding of these needs. Software firms were by far the most likely to claim important effects for their innovations on their users’ performance and/or productivity, but, surprisingly, Technical Services had only an average propensity to make this claim.

Firms that introduced more than one type of innovation were most likely to report important effects on their own and their clients’ performance. This was particularly
the case for those introducing both service innovations and non-service innovations. This may tell us about the effectiveness of combining multiple innovations (e.g. technological innovation and organisational innovation should be undertaken in an integrated fashion, as much of the management literature argues). It may also be suggestive of differences in firms’ strategic orientation – some firms are more proactive and thus effective in shaping their own and their clients’ destinies (e.g. more competitive firms introduce multiple types of innovations in order to achieve multiple effects).

Several lines for further research that this study suggests have been mentioned above. But perhaps the most pressing need is for studies that link together both service suppliers and their clients, eliciting the views of both as to the innovative contributions of the business partners – or, possibly, more ethnographic studies of these interactive innovation processes.19

Further elements of the innovation survey literature might be reviewed here, were there more space and time available. In particular, there are studies dealing with the use of information inputs from various sources (including KIBS) and the formation of collaboration with different parties (e.g. the work of Bruce Tether).

### 3.2 Knowledge as a focus

#### 3.2.1 Knowledge interactions

What the sorts of knowledge do KIBS produce and process, and how are these used?

Knowledge can be about effectively anything, but business requires rather limited varieties of knowledge (though this still covers an immense range of topics). Figure 3 (from Miles, 2000) outlines a broad-brush classification of the sorts of attributes of, and entities in, these environments (in boxes with straight lines surrounding them). The boxes with dotted lines round them represent points at which KIBS may be involved in mediating the flows of information to do with these features of the two environments. For example, consider the KIBS function

19 There are few studies that combine attention to suppliers and clients. See the RISE website for one European project on this theme: http://centrim.bus.brighton.ac.uk/open/we/do/proj/rise/rise.htm and the studies by Bolisani and Flanagan reported in Andersen et al (2000) for studies in the fields of ecommerce and web services, for example.
that is uppermost on the left. Such a KIBS may act as a source of intelligence on the competition faced by the firm: it may be studying the technology used by competitors and the available information on their new product and process strategy, examining records dealing with their plans for establishing operations in various locations, looking at market reports concerning their recruitment strategies, and so on. As with all KIBS, such functions may be internalised within the client firm, or “outsourced” to a specialised KIBS provider. One factor affecting this may be confidentiality issues – when a KIBS serves several companies in the same sector, it may have to tread very carefully and erect internal barriers to prevent confidential knowledge “leaking”.

This discussion raises the question of “absorption capacity”. The client must be able to make use of the knowledge inputs from the KIBS. Even when a function has been practically entirely ceded to a service provider, the client still has to play a role in managing the service relationship – to ensure that it is receiving what it needs at the appropriate cost. Thus it is likely that some knowledge functions relevant to the KIBS will still need to be retained in-house by the client.

Continuing with the discussion centred on Figure 3, the KIBS are seen to be mediating the flows of information depicted here. But what does this mean? It can involve selecting or actively processing the information, or structuring the relationships involved in the flow. There is thus a wide range of quite distinct operations that may be performed by KIBS here (though in practice many KIBS will perform several of these operations at any one time). The activities may centre on:

- Locating information and/or creating it (from data, research, etc), and processing and presenting it in useful forms to the organisation. This information can be about information about the organisation itself or its environment. The KIBS’ problem-solving activities may not necessarily mean coming up with new solutions, generating new knowledge, then. The KIBS task may involve application of methods of locating what can be labelled as “best-practice” – in other words, a solution to the problem that is already being demonstrated within the client organisation or elsewhere. “Benchmarking” has become a widely used tool for examination of how different actors are seeking to cope with common problems.

- Presenting information about the company and its operations to external and/or internal audiences. In some cases (e.g. auditing) this may involve extensive location and/or creation of the information. In some other cases it may be largely a matter of processing data handed directly from the organisation. And in many cases it will involve some negotiation bet-
ween the KIBS and the client as to precisely what messages are to be conveyed, how, and to whom.

- Organising the media used as interfaces between the organisation and its internal and external environments, and helping to establish the routines whereby the organisation will continue to monitor and shape the flows of information through these media (with or without the continuing support of KIBS).

- Training, which constitutes a specialised version of the activities above, where the information processed is chosen and presented so as to help staff members develop skills and capabilities (and sometimes motivation) required for their jobs. In addition to the presentation of information, tasks may be designed, tests prepared, equipment deployed in the training scheme.

- So far the list of activities has leaned towards the presentation of information to inform decision making of one sort or another. But the role of the KIBS can go well beyond this, and there are two further activities that should be stressed. First, the KIBS may be active in prioritising, recommending choices, and similar activities: normally this involves a dialogue with the organisation, and quite often it requires some sort of mediating role in reconciling different views and objectives held by different members or branches of the organisation.

- Second, the KIBS may be required to be far more active in terms of locating, testing, negotiating with the suppliers of external resources. For example, in technology choice the KIBS may need to trial and compare different packages – this is a systems integration role. In personnel recruitment, the KIBS may need to be active in headhunting and “selling” the opportunities to viable candidates; or in the more KIBS-like “temporary work” services (e.g. contract management services) the KIBS may have a role in training and supporting the new staff. So, there may be a role in “processing” the entities involved, not just in developing intelligence about them.

- In the case of facilities management, this role extends beyond assisting the client with the location, choice, and implementation of suitable assets. There is an ongoing role in managing the resource that the firm has required – indeed, the resource may be owned by the KIBS, which simply offers the client the ongoing service that it provides. The case of logistics has already been mentioned, and much attention has been given to such facilities management services as those concerning computers and networks, buildings and estates.
A number of recent studies have been examining the knowledge relationship between KIBS firms and their clients. Thus Strambach (2001) depicts KIBS as developing knowledge through their interactions with clients, “codifying” this knowledge by turning it into information and routines, and then using it to enter into new client relationships. She sees KIBS as integrating different types of knowledge for particular clients, as adapting the information to their demands and requirements. This can help explain how it is that clients entrust KIBS with strategic information (sometimes – in some other cases this is certainly not the case), knowing that they may also be servicing other firms in the same sector. They stand to gain from the KIBS’ application of knowledge that has been generalised out of the experiences of the sector more broadly, and contributing their own experience is part of the necessary trust relationship. And in any case, they will not get the right solution to their problems if they withhold important information – and the best solution is likely to come from KIBS with that generalised knowledge.

This implies that often the critical knowledge resources, that differentiate one KIBS from another, reside in knowledge less about the core practices, techniques and technologies of the service, and more about its own and its clients organisational practices and service encounters. Understanding of the sorts of problems that clients face and the ways in which the service solves these, and the personal relationships and networks established with specific clients and other professionals, is critical. The departure of senior staff, taking with them knowledge of, and links with, the client base, can thus be a major challenge to KIBS firms. Reputation is very important for KIBS in attracting and retaining staff, as well as clients.

Strambach (2001) uses a model of transformation of knowledge from tacit to codified forms that is reminiscent of the approaches to organisational learning developed by Nonaka and Takechui (1995). The management scientist and consultant Dawson (2000) sees the patterns of movement identified by Nonaka as being very appropriate to thinking about the processes whereby professional KIBS create knowledge from interaction with clients, turn this into products that the clients can benefit from, and participate in helping their clients internalise this as in-house knowledge. In working with Nonaka’s model, Dawson – rightly in our view – distinguishes between “knowledge” and “information” rather than using the terminology of tacit and explicit knowledge (Table 5). The activities at stake, then, are a matter of effecting transformations within information and knowledge, and of using each to further develop the other.
**Table 5. A reworking of Nonaka’s model**

<table>
<thead>
<tr>
<th>TO: ⇒</th>
<th>FROM: ↓</th>
<th>Knowledge</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td>Socialisation: <em>Transfer of knowledge between people (through interaction rather than mediated through captured information)</em></td>
<td>Externalisation: <em>“Capturing” people’s knowledge by rendering it as documents or structured processes</em></td>
<td></td>
</tr>
<tr>
<td><strong>Information</strong></td>
<td>Internalisation: <em>“Knowledge acquisition” – learning how to use models, formulae, equipment, methods etc.</em></td>
<td>Combination: <em>Systematising and/or translating formalised concepts into new frameworks, procedures, etc.</em></td>
<td></td>
</tr>
</tbody>
</table>

The idea that knowledge development takes place through a (typically clockwise) movement through these different categories is a powerful heuristic that may be useful in understanding how KIBS operate with their clients.

- **Socialisation**: — a process of sharing experiences between clients and KIBS, wherein the KIBS in particular create such knowledge as mental models (shared with clients at this stage, for example in problem definition) and technical skills. Within the KIBS there may also be the synthesis of different types of knowledge that Strambach refers to. Socialisation tends to be underpinned by professional group processes and KIBS organisational culture.

- **Combination**: There is a process of development of information resources from this knowledge – this involves the conversion of one system of formalised concepts into another, translation of ideas into a form that the client can absorb, production of documents and videos, reports and material for presentations.

- **Internalisation**: this involves converting the information products into specific know-how. Internalisation may involve ‘learning by doing’, or tuition or mentoring of some sort; the process of making presentations and reporting back to clients is an opportunity to align mental models, to make sure that information is being used in the appropriate way.

- **Externalisation**: Nonaka and Takeuchi see this as being at the core of the organisational knowledge creating process, though they suggest it has been neglected by organisational theory (the success of their book
suggests this is a widely shared perception). Within the client, externalisation may involve the learning that has been achieved as a result of the interaction with KIBS taking concrete form in mission statements, codified organisational concepts, new metrics for accounting, new decision models, etc. A similar process may be underway in the KIBS, too, as it seeks to reproduce the learning and innovations attained through the interaction with specific clients.

Glückler (1999) and Schulz (2000) are among authors who touch on such a cycle of knowledge generation, noting that consultants learn from the businesses to whom they supply knowledge. Inter-organisational learning is involved, rather than one-way knowledge transfer, in many cases. Explicit or, often, implicit knowledge is “extracted” from the client firm by the KIBS, and this knowledge is used in successive KIBS services, quite possibly including those supplied to other clients.

Den Hertog (2000) also cites the Nonaka & Takeuchi model, suggesting that it emphasizes several points relevant to the KIBS-client interface:

- The combination of more tacit and explicit, codified forms of knowledge (information) exchange in organisational learning.
- The role of interaction between team members and employees from various organisations in creating knowledge new to the firm, so that the knowledge base of the client firm is enriched by confrontation with that of the KIBS provider. This mainly involves personal interactions between professionals – thus the client firm must have access to professionals who can participate in such dialogue.
- The dynamic nature of “knowledge conversion processes” in which various forms of tacit and explicit knowledge are constantly mixed, redefined, linked, exchanged, reshaped and enriched as KIBS and their clients interact. KIBS can trigger and strengthen such processes in clients, acting as catalysts, who help internal communication and knowledge conversion. For example, new project teams are set up, employees are forced to interact, to make tacit knowledge explicit, to think about new combinations of knowledge and rethink their mental models.

Den Hertog (2000) sees the KIBS-client relationship as varying along several dimensions, among which that of explicit/codified knowledge versus tacit/non-codified knowledge is but one important case. Though there is rarely a price tag on exchange of tacit forms of knowledge, they are at least as important in
many KIBS – client interactions as the more codified. The other three dimensions are:

1. **Discrete/tangible vs. process oriented/intangible knowledge resource flows.** (Often the two are co-produced. A software provider solution will not only produce a knowledge flow “embodied” in a software package. While learning about the client and establish relationships with its staff, advice may be provided on other topics, the client introduced to a network of similar software users, etc.)

2. **Human embodied knowledge versus non-human (capital, written information) knowledge resources.** The former require face to face interaction between service provider and client firm. Disembodied knowledge flows are typically written down (a report, an action plan, an article in a magazine, an electronic database) or incorporated in a capital good or piece of equipment.

3. **Contractual versus non-contractual forms of knowledge.** Contractual and non-contractual forms of knowledge exchange often coincide; especially when KIBS have a more or less steady relationship with a client, contractual knowledge flows are liable to be supplemented with more informal types of knowledge flows. Den Hertog stresses that this is not only the result of KIBS trying to link client firms, but also a matter of experts or professionals of both KIBS and client firm developing (trustful) relationships.

While many KIBS are likely to provide fairly standardised information support, or aid to clients engaging in incremental innovation, we might expect that KIBS are most likely to exert an innovative organisational or technical impact through close and continuous interaction with clients, based on mutual familiarity and trust. KISINN (1998) supported case study work that concluded that KIBS (consultancies in particular) underpin various types of corporate change – and that this requires sustained processes of client-consultancy interaction. The key elements in this innovation support were seen as being access to experienced and specialist personnel, knowledge of IT applications, flexible modes of organisation, their capabilities to codify and adapt knowledge to diverse client needs, and their access to international practice (This latter factor was seen as becoming more important as KIBS internationalise and gain access to international networks).

Dawson (2000) argues that professional KIBS often need to develop strategies not to standardise their products, but to engage in more sophisticated knowledge sharing with clients. His book is packed with examples of different ways in which this can be done, adding value to the KIBS-client relationship.
These seem to be highly promising approaches to better understanding the (changing) roles of KIBS – and perhaps to add some much-needed depth to analysis of the knowledge-based economy.

3.2.2 Knowledge management in KIBS

Hansen et al (1999, pp108) argue that “because knowledge is the core asset of consultancies, they were among the first businesses to pay attention to and make heavy investments in the management of knowledge”. But some firms do extensively use IT-based Knowledge Management systems. In a small set of case studies of large US firms. Including health care services and especially consultancies, Hansen et al, (1999) report on more established use of such systems. They note two main successful use strategies, arguing that while a mixture of the two is common in practice, companies have to decide to make the one most appropriate to their core services the centre of their strategy. They suggest that a balance of roughly 80/20 is effective.) The two strategies are:

- **Codification.** Information systems are established to enable rapid reuse of information resources (presentations, templates, algorithms, etc) developed by staff. Aim to reuse these assets many times, providing minor variants of relatively standardised solutions to frequently-encountered client problems. This makes it possible for there to be relatively many junior and few senior staff (associates and partners, respectively), often working in large teams and generating large overall revenues. Incentive structures need to reward contributions to the pool of knowledge assets.

- **Personalisation.** Information systems are more oriented to facilitating communication among members of staff, who typically work on challenging problems with many new features, requiring bespoke or highly customised solutions. Work is executed through high ratios of senior as opposed to junior staff, working at high fees with a focus on high profit margins rather than volume of business. Systems are developed to allow individual expertise to be located and consulted (and to exercise oversight) as appropriate. Incentive structures need to reward contributions to other’s problem-solving.

In each case we might anticipate that the use of IT-based systems will lead to more rapid internal diffusion of innovations in service products and processes. Whether the codified strategy may suppress the original generation of innovations, however, by encouraging reuse of earlier work and thus – while limiting needless redundancy
– making it less likely that alternative solutions will be sought, is more uncertain. Competitive firms will need to ensure that staff are able to creatively generate solutions as well as routinely deploying established procedures.

Hansen et al’s vanguard KIBS may have taken up IT-based Knowledge Management tools extensively. These are the exceptions at present, however. At least two factors may make the adoption of IT-based “groupware” tools rather problematic for KIBS. First, much of their knowledge is highly complex and “tacit”, in the sense that the experts have only partly spelled out just what it is that they do and how it is that they work – meaning that it is hard to reflect this knowledge base in the limited sorts of information “captured” in databases or CSCW (computer supported co-operative work) systems. Second, the knowledge interactions with clients are often so extensive that effective Knowledge Management systems would require involvement of many players outside of the KIBS itself. This creates problems of standards, secrecy, and organisational co-ordination.

There has been much interest in the ways in which certain large service firms have utilised groupware for locating their own expertise and disseminating knowledge of innovations. In a few advanced firms Web and groupware technologies have been applied in recent years in best-practice databases, and also as means of enabling staff members to locate expertise within the firm, to consult other staff members as to how particular projects can be expedited, and as repositories of techniques, templates, and tools. But there is little examination of the use of such practices more generally in KIBS.

Reimus’ (1997) surveyed a fairly large number of US management consultancies. About 75 percent of the firms had instituted processes for capturing best practices, sharing information from one project to another and documenting innovative new ways of solving client problems. But these were largely informal initiatives, sharing innovative knowledge from the staff through spontaneous meetings, etc. Fewer than half of the firms had an active best practices database in place. (Kautonen [2001] similarly reports that personnel training and mentoring were important ways of diffusing good practice in Finnish KIBS, while other formalised knowledge management remained underdeveloped.) Those consultants who were more oriented to the application of codified methodologies were more prone to use formal techniques of knowledge management than those relying more on expertise. Reimus suggests that this tends to lead to standardisation of services. One of the main obstacles to developing improved knowledge management was reluctance from experts to share information and to update material.
Leiponen (2002) raises an additional question: what are the consequences of different ways of managing knowledge across the supplier-client interface? He explores the relations between allocation of control rights over intellectual assets between a business service supplier and its client, on the one hand, and innovation outcomes on the other. A major conclusion is that KIBS suppliers who retain control of their own intellectual output are liable to be more innovative. Thus that business service firms seem more likely to be innovative if their internal knowledge resources are controlled organisationally, or collectively, as opposed to being controlled by individual experts. Why might this be? One factor may be the increased scope for diffusion of knowledge, and for bringing together and synthesising different knowledges, within the firm; another might be that where there is organisational control of knowledge, there is liable to be more support for investment in R&D and other innovation-oriented activities. Another conclusion concerns the role of KIBS clients. Especially when they are in long term relationships with the service supplier, client firms will need to steer a careful path. They may well want to control outsourced service activities, and the intellectual property resulting from these; but they will lose out if such controls are so intense as to reduce the KIBS’ incentives to invest in learning and innovation.

Clients can be important for KIBS internal processes and knowledge bases. Thus Muller & Zenker (2001) and Strambach (2001) both suggest that KIBS firms can develop their own knowledge base and innovation capability through interaction with clients in various ways. The interaction may pose new technical problems that require solutions, may involve sharing knowledge about these problems, may link KIBS to sectoral innovation systems and other innovative firms, etc.

One source of information as to the influence of client interactions on KIBS comes from Tether’s (2001) of the CIS-2 survey data for the EU. Table 6 sets out some of the results he presents. First, the data confirm that the technology-oriented KIBS (technical and computer services in particular, followed by financial services) are more innovative than the other services sectors studied. Second, we can examine the firms’ ranking of the importance of various ‘sources of information’ – in Table 6 these sources are ranked in order of with the proportion of firms that indicated they were ‘very important’ (and the data also display the proportion that indicated that the source was at least ‘relevant’). Third, we also have data on whom the firms collaborate with in innovation projects.

‘Sources within the firm’ itself emerge as the most cited source of information for innovation. Amongst the various external sources of information for innovation, the most widely identified as being both relevant and very important were customers (or clients): this is most striking for computer services KIBS. Apart from
this branch, it is not apparent that KIBS are unusual among service industries in terms of learning from their clients, at least in terms of information that supports innovation. (A study in Singapore, discussed below, provides somewhat more insight into client relations and KIBS’ innovation.) While many firms recognised customers as a very important source of information, far fewer engaged them in collaborative arrangements for innovation with them – but again customers were typically the most significant external partners.

Suppliers and competitors are also widely seen as relevant sources of information for innovation – and rather high proportions of firms (especially KIBS) identified such sources as fair and exhibitions, professional meetings and journals, and computer networks as relevant sources of information for innovation.

Tether goes on to report a factor analysis of these data (excluding the most important sources: those within the firm, suppliers and customers). The three groups of sources are:

1. Competitors – which suggests these firms may be following an imitative strategy, watching their rivals and seeking to copy their successes whilst avoiding their mistakes (more common amongst financial services and wholesales, and was less common amongst computer and technical services).

2. Sources such as professional conferences, meetings and journals, computer networks and fairs and exhibitions, which suggests a search strategy of actively scanning the environment for ideas and technologies for innovations (especially common amongst technical services but was uncommon amongst computer and transport services).

3. Universities, research institutes and patents – which suggests an importance of disembodied technical information, perhaps associated with higher levels of innovation (common amongst technical and computer services, uncommon amongst transport services).

These are interesting results in terms of how KIBS operate, and how different KIBS may operate, but take us away from the primary focus at present on KIBS-client interactions. One study that did focus on relations between client interactions and innovations in KIBS is Wong and He’s (2002) survey of 181 KIBS firms in Singapore (spanning IT and related services, business and management consulting, engineering and technical services). One result was
that those KIBS firms that provided innovation support to manufacturing clients displayed higher levels of innovative behaviour. Client size was not a significant factor, however. Discriminating between product and process innovation, it emerged that the impact of having manufacturing clients tended to be on product innovation only – suggesting that product innovation involves more interaction and knowledge exchange with clients. In contrast, process innovation may require more support and interaction with suppliers of equipment and software. KIBS firms providing innovation support to manufacturing clients were found to be more integrated into public knowledge infrastructures, linking to R&D institutes/universities.
Table 6. CIS-2 data on services innovation and the sources of information for innovation

<table>
<thead>
<tr>
<th>Percent of sample that are:</th>
<th>All</th>
<th>Transport</th>
<th>Wholesale</th>
<th>Financial</th>
<th>Technical</th>
<th>Computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Innovating enterprises’ (1)</td>
<td>36 %</td>
<td>24 %</td>
<td>32 %</td>
<td>44 %</td>
<td>48 %</td>
<td>65 %</td>
</tr>
<tr>
<td>Enterprises with innovative activities (2)</td>
<td>41 %</td>
<td>29 %</td>
<td>38 %</td>
<td>52 %</td>
<td>52 %</td>
<td>68 %</td>
</tr>
<tr>
<td><strong>Innovation undertaken:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mainly by others</td>
<td>18 %</td>
<td>28 %</td>
<td>16 %</td>
<td>21 %</td>
<td>15 %</td>
<td>9 %</td>
</tr>
<tr>
<td>- Jointly with others</td>
<td>32 %</td>
<td>28 %</td>
<td>32 %</td>
<td>37 %</td>
<td>31 %</td>
<td>26 %</td>
</tr>
<tr>
<td>- Mainly in-house</td>
<td>51 %</td>
<td>43 %</td>
<td>51 %</td>
<td>42 %</td>
<td>54 %</td>
<td>65 %</td>
</tr>
<tr>
<td><strong>Importance of sources of information (relevant [very important]) (3):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Co-operative arrangements for Innovation with:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Any external partner</td>
<td>30 %</td>
<td>24 %</td>
<td>30 %</td>
<td>36 %</td>
<td>39 %</td>
<td>44 %</td>
</tr>
<tr>
<td>- Suppliers</td>
<td>17 %</td>
<td>11 %</td>
<td>17 %</td>
<td>16 %</td>
<td>17 %</td>
<td>22 %</td>
</tr>
<tr>
<td>- Customers / clients</td>
<td>15 %</td>
<td>9 %</td>
<td>13 %</td>
<td>13 %</td>
<td>21 %</td>
<td>20 %</td>
</tr>
<tr>
<td>- Competitors</td>
<td>11 %</td>
<td>8 %</td>
<td>10 %</td>
<td>10 %</td>
<td>9 %</td>
<td>15 %</td>
</tr>
<tr>
<td>- Consultants</td>
<td>11 %</td>
<td>6 %</td>
<td>9 %</td>
<td>16 %</td>
<td>8 %</td>
<td>13 %</td>
</tr>
<tr>
<td>- Research institutes</td>
<td>9 %</td>
<td>5 %</td>
<td>8 %</td>
<td>3 %</td>
<td>14 %</td>
<td>11 %</td>
</tr>
<tr>
<td>- Universities</td>
<td>8 %</td>
<td>5 %</td>
<td>6 %</td>
<td>3 %</td>
<td>15 %</td>
<td>14 %</td>
</tr>
</tbody>
</table>

Notes: 1) ‘Innovating enterprises’ are those that introduced a new service or methods to produce or deliver new services in 1994 – 96. 2) ‘Enterprises with innovative activities’ includes both innovating enterprises and enterprises with incomplete or unsuccessful innovation projects undertaken in 1994–96. 3) First figures = % of firms identifying the aim as relevant; Figures in parenthesis = % of firms identifying the aim as ‘very important’.
3.2.3 Knowledge infrastructure

The SI4S project identified a range of roles that KIBS can play in providing what Pim den Hertog and Rob Bilderbeek termed a “second knowledge infrastructure”. KIBS develop and diffuse knowledge – sometimes with government support, like the traditional knowledge infrastructure – through conferences, courses and training, as well as through direct inputs to their clients. They often serve as a link between the traditional knowledge infrastructure (universities, government laboratories, etc.) and their clients. They also link clients to other parts of a potentially very extensive range of knowledge sources: technology suppliers (especially IT companies such as “system integrators”), non-academic research centres, and consultancies (and for transnational KIBS, the mother company may be an important knowledge source).

Den Hertog & Bilderbeek, (1997) suggest that KIBS could in practice gradually develop into an second knowledge infrastructure, partially complementing and partially taking over the intermediary role traditionally played by parts of the first knowledge infrastructure. This category of KIBS will function as a diffusion agent, or even as a source of innovation, for clients. Another possibility is that the traditional distinction between public and private knowledge-based (advisory) services will gradually disappear. Networked service professionals – irrespective of the formal organisation to which they belong – will increasingly act as carriers and sources of knowledge. This blurring of boundaries will eventually result in a more flexible capacity of external KIBS professionals, co-operating with internal KISA professionals, in providing the requisite services. There is some evidence of blurring boundaries between services offered by the public knowledge infrastructure and KIBS, but the two infrastructures generally play different roles within innovation systems.

Universities primarily have relations with large R&D-intensive manufacturing firms and (in the case of social and administrative knowledge) the public sector. KIBS firms have a much broader spectrum of clients, including public authorities and some smaller firms. Large firms and other organisations benefit disproportionately from both knowledge infrastructures, SMEs with their relatively low levels of internal competence, and limited financial resources, often lack capabilities for making effective use of KIBS, and typically rely on public or semi-public sources for external knowledge.

There is a body of research into one important component of the public knowledge infrastructure – Research and Technology organisations (RTOs). These have historically been public bodies in general. But – to differing extents across EU
member states – they have been pushed recently more towards combining public and commercial sources of funding, and functioning in the same spheres of activity as purely private KIBS. RTOs supply industry with services, on a contracted and/or public goods basis. The current status and role of RTOs has been extensively documented in the RISE (Research Institutes in the Service Economy) project.20

The following points are largely taken from this project.

RISE studies confirmed that there is a general trend of decreasing shares of public funding in RTO budgets, though the balance of funding varies considerably across countries and individual RTOs. RTOs are also tending to combine research that is more academic/basic with that which is more applied. They are engaged in various innovation-related activities. They are increasingly reliant on industrial contracts. Again, there are differences between countries and activity areas in the pace of change; and its impact on the RTOs’ functional orientation and output.

RTOs may compete with each other (sometimes across national borders, as in the case of measurement services); increasingly, they compete with KIBS. The RISE project examined this competition, which mainly concerns the provision of services that can be directly appropriated by a client (or, as is often the case with RTOs, an industry “club”). RTOs’ increased business orientation leads to more emphasis being placed on client/club services, and more concern being felt about Intellectual Property in general. RISE’s small survey samples were insufficient to estimate the magnitude of such competition between RTOs and KIBS, but did indicate not only that it was intensifying (largely in result of changes in RTOs’ funding regimes), but that also their strategies and outputs were changed correspondingly. Significant differences between RTOs and private sector KIBS remain. “Public good” and less appropriable functions – helping to support the innovation infrastructure by developing useful metrics and standards, diffusion and publication of research results, awareness programmes, contributions to education and training in general – still remain functions of most RTOs. KIBS firms typically have much less activity in these latter services (and here they may be used as a marketing tool, a reward for staff, a way of gaining professional recognition, a service paid for by public agency clients, etc.).

One of the implications of these studies is that the public infrastructure is itself changing. It is probably more appropriate to think about a spectrum of organisational types, from traditional public forms through a variety of privatised, spun-off, and hybrid forms, to purely commercial organisations. Questions are raised about how KIBS will function in such an environment, together with

20 Accessible at http://www-centrim.bus.bton.ac.uk/open/we/do/proj.rise/
important issues about how, for example, public good aspects of the first knowledge infrastructure (e.g. general awareness activities, standards-setting, scholarly training and publication) will be maintained.

3.3 Supplier-client relationships

3.3.1 Sparring and jobbing relationships

An influential set of analyses and a framework for describing service supplier-client relationships, in the context of professional services such as management consultancy, stems from the work of Pietr Tordoir (1993, 1994, 1995). He distinguished between three main types – or perhaps more like ideal types – of relationship:

- **sparring** relations: here services are supplied to management and the nature of the service to be delivered is typically negotiated between supplier and user, communication as roughly being equal in status, knowledge and competence (though the client will usually lack some expertise in the specific problem at hand). Trust and rapport are important. Strategic management consultancy and organisational problem solving are liable to involve sparring relations, as can more advanced professional services (e.g. sophisticated legal support).

- **jobbing** relations, involve less interaction, typically, and require the service supplier to perform a specialist and technical professional task, clearly defined by the client (who may well be client expert in the topic, or at least in the content of the service to be provided). The client may direct the process of service provision; engineering and technical services, and some routine accountancy and administrative services, may often take this form.

- **sales** relations involve more standardised services, or services produced in relatively standardised ways, which may even be developed before the transaction (e.g. some computer software, some industry intelligence functions).

The opportunities for knowledge transfer and interactive learning across these different types of relation are clearly varied ones. Sales relations presumably offer little scope for learning, while the other types of relation may differ in terms of the
potential for generation (coproduction) of new knowledge and the dissemination of practices based on incremental or more radical knowledge development.

We have little evidence as to the relative distribution of these different types of relationships among KIBS and their supplier-client relationships. One relevant, but partial, set of information comes from a German service innovation survey of the mid-1990s. The survey asked about the ‘standardisation’ or ‘specialisation’ of service firms’ outputs. The companies were requested to divide their (1994) sales into the shares: earned from ‘standard services’ (i.e., ‘those without customer specific changes’); from ‘partially customised services’; and from ‘specialised services’ (i.e., ‘bespoke [custom-made] services’). KIBS reported more specialised service supply than other service sectors. Wholesale and retail trade tend to be most standardised, followed by transport and communications, banking and insurance and other business services. In these sectors ‘standardised services’ accounted for over 70 % of income, ‘partially customised services’ accounted for between 11 % and 27 % of income, and ‘specialised services’ for 10 % or less of the income (just 1 % in the Transport and Communications sector). But turning to more KIBS-like activities (some will be in “other business services”) Technical Services and Other Financial Services report earning just over half of their income from ‘standardised services’, whilst 25 % – 30 % was due to ‘partially customised services’ and 16 % – 18 % was due to ‘specialised services’. Software was more like the non-KIBS, with 76 % of income from ‘standardised services’, 15 % from ‘partially customised services’ and 9 % from ‘specialised services’.

However, software services are actually very divided between small and large firms. Larger firms tend to earn more from ‘standardised’ services, while smaller firms have more activity in ‘partially customised’ and ‘specialised services’. The result is that is we consider the distribution of income in the average software firm, it id much more like the other KIBS with 52 % standardised, 30 % partially customised and 19 % ‘specialised’. Large software firms are more like non-KIBS, smaller firms more like other KIBS.

It is tempting to view this in terms of Tordoir’s framework, and it certainly seems plausible that the more standardised services are effectively “sales relationships” in his terms. The correspondence between sparring and jobbing relationships, on the one hand, and specialised and partially customised on the other, is probably rather less precise. Nevertheless, these survey data do tell use to expect all three of Tordoir’s categories within most KIBS sectors – and maybe even more sales relationships than most commentators have suggested.

One attempt to apply the framework has been presented by Schulz (2000) in a study of environmental services. Figure 4 presents his classification of such
environmental services into Tordoir categories. (Though Schulz warns that the demarcations are likely to be weak, with various overlaps or exceptions. Changes in location may evolve over time: thus he suggests that a training and education service might move to more of a sparring relation when dealing over a longer period with top management in the client, or when the service is transformed towards, say, developing a training strategy for the whole enterprise. Alternatively, eco-labeling can be moved from a sparring service towards a simple sales relation, when and if it becomes a standardised act of certification.)

Source: Schulz (2000)

Figure 4. Environmental Services’ Relationships with Clients

In terms of the impacts on clients, a case can be made that it is the sparring relationships that are more likely to induce profound change. KISINN (1998) argued that KIBS are liable to have more influence on strategic and technological innovation when they attain: close and co-operative working relations with client firms and their staff, with the KIBS’ technical expertise complementing that of the clients’ staff. The KIBS must be trusted to bring informed and impartial perspectives to the client’s strategic decisions. We should not assume, however, that
it is only profound change that can be beneficial: in practice most innovations are incremental ones, and too much change can sometimes be a very undesirable thing.

Shrimpton et al (1998), in the context of examining possibilities for KIBS export promotion on Canada’s Atlantic seaboard, made case studies of KIBS in similar situations elsewhere, from which experience they stressed the importance of relationships and their management. KIBS can be seen as selling the expertise of their personnel, which makes it critical for the KIBS supplier and the client to establish a relationship of trust. One big problem for KIBS’ knowledge management that this gives rise to is the difficulty of generalising trust relations away from the individual experts to the KIBS firm as a whole. This is a reason why the mobility of key staff can be a problem for KIBS – and can even mean the loss of key clients, who may follow the individuals with whom they have established relationships.

Another implication of this is that marketing is typically carried out by professionals operating in their networks, and is hard to locate in a specific marketing department. Marketing skills need to be part of the professional portfolio – and the professional must be skilled enough for the marketing function not to interfere with the production and delivery of the services required. This may be one reason why many KIBS are active, and encourage their staff to be active, in professional networks and associations, in conferences and other events that allow them to demonstrate their competence and capacities. Publication and other media exposure may also be sought – and may be regarded as a reward by the staff involved.

3.3.2 Location and proximity issues

The question of proximity between client and KIBS was touched on earlier, as part of the discussion of geographical approaches to KIBS. The literature discussed there stressed the important role of local KIBS (or at least, local offices of KIBS) to SMEs in particular. Thus Wood (1998), drawing on Granovetter’s (1985) concepts of embeddedness and weak-ties, explores the relationship between SME clients and KIBS. Large clients search for leading-edge inputs, irrespective of location, whilst many SMEs search locally. This is not only a matter of the cost and delays that may be associated with the expert’s travel. IT also reflects imperfect market information for potential clients to identify KIBS. Personal contacts and weak-ties with friends and business acquaintances are thus used by SMEs, and these will mainly lead to selections from the local area.
Other lines of work have tended to downplay the role of proximity (e.g., Daniels et al. 1992; Strambach 1993; Tordoir 1994). They cite studies of services internationalisation to show that many consulting firms serve clients outside of their home regions, often over considerable distances. Similarly, clients of KIBS do not typically state that proximity is a major factor in choosing and contracting management consultancies. (See Figure 5, which suggests that this varies across different KIBS, with management consultancy services being least susceptible to space constraints.)

<table>
<thead>
<tr>
<th>Services</th>
<th>very important %</th>
<th>important %</th>
<th>less important %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel recruitment</td>
<td>37</td>
<td>36</td>
<td>26</td>
</tr>
<tr>
<td>Engineering</td>
<td>36</td>
<td>32</td>
<td>31</td>
</tr>
<tr>
<td>Data proc./software</td>
<td>29</td>
<td>46</td>
<td>24</td>
</tr>
<tr>
<td>Marketing/advertising</td>
<td>32</td>
<td>29</td>
<td>38</td>
</tr>
<tr>
<td>Management consulting</td>
<td>13</td>
<td>28</td>
<td>58</td>
</tr>
<tr>
<td>Business services</td>
<td>28</td>
<td>33</td>
<td>38</td>
</tr>
</tbody>
</table>


Figure 5. Clients’ views as to importance of the proximity of different types of KIBS

In terms of Tordoir’s typology, we would expect that sparring relations, with intensive and frequent interaction, will tend to require proximity. Where interaction is infrequent or less intensive, for example in jobbing or sales relations, spatial contiguity is less necessary. If expert labour is required, as is the case for most KIBS, then the KIBS firms may well be located close to their major clients and markets, i.e. typically in metropolitan centres.

A rather similar argument can be applied to KISA within companies. Illeris (1994) notes that back office activities (and related business services such as call centres) can be located where labour or other costs are low, as the key interactions can largely be handled via use of telecommunications. Illeris notes suggests that more customised services tend to reflect strong proximity tendencies – the costs of transport are relatively important. But highly specialised services are in a situation of trade-offs. Many of them require considerable face-to-face communication (this may be less true for some technical services), but the high costs of expert labour will easily outweigh transport costs.
One other set of issues surrounding KIBS (and probably RTOs, too) is being highlighted in the RETINE (REgional Typology of Innovation NEeds) project recently carried out by ISI and BETA. This study examined regional diversity in the needs related to innovation as experienced by KIBS and manufacturing SMEs in particular. It drew on the ERIS (European Regional Innovation Survey) database to examine ten European regions.

The study concluded that innovation needs are not uniform across the EU, but are experienced to very different extents in different regions. Two main groups of variables differentiate the regions—financial needs ("lack of capital", "availability of venture capital") and access to knowledge (research capacities, consultancy supply, regional workforce, etc.). Essentially, some regions confront far more difficult environments for innovative KIBS than do others. Generalisations about KIBS based on empirical evidence have to bear such variations in mind;—as will policy initiatives for KIBS and KIBS-mediated innovation. We may need a concept similar to social exclusion, say "business service exclusion", to describe the situations of some SMEs and some businesses in peripheral regions.

It has long been apparent that there is highly unequal access to business services in different parts of European society. Such services are much more developed in some regions, and in orientation to certain sectors and sizes of client. We can be sure that some classes of business (especially SMEs) in some regions (especially more peripheral ones) will be poorly serviced by KIBS. This could be a topic for regional policy to address.

### 3.3.3 Client roles

There has been a strong tendency for studies of KIBS to suggest that KIBS do benefit their clients. But there has been much less analysis of what happens at the interface of individual firms. Studies of the benefits of using new technologies show that these benefits are as much a matter of user strategy as of the technologies themselves. It is highly plausible that, similarly, the capacity to effectively interface with KIBS will strongly shape the impacts of their use. As in the case of the business use of IT, it may be that inadequate use of KIBS can hinder the clients’ adaptation processes, rather than forwarding them. Industry criticism of consultants

---


22 Alsace, Baden, Barcelona, Gironde, Lower Saxony, Saxony, South Holland, South Wales, Stockholm and Vienna.
– which is not infrequently encountered! – may not only mean that some service firms offer poor quality products (some certainly do). It may also reflect firms’ difficulties in using these services in an informed way. Client managers require capabilities to make effective use of KIBS: the ability to choose among KIBS, combine different KIBS and in-house skills, be able to negotiate the definition of problems and solutions in sparring relationships, and so on.

Sjøholt, P (2001) examines the “transfer” of knowledge in transnational consultancy firms through a series of interviews with both provider and client firms in Norway. Along with other case study analysts (e.g. Wood (1998)) he concludes that successful learning through the use of KIBS requires that the client has already accumulated knowledge that can be used to “absorb” KIBS inputs, and has capabilities to formulate and reformulate problems in the course of the interaction. More sophisticated clients make better use of KIBS. Glückler (1999) likewise argues that the fact that clients may contract a consultant in order to improve on certain operations, does not mean that these clients are the weaker firms in their sectors. Often it is the more knowledgeable clients who seek to establish long-term sparring relations with their KIBS suppliers (consulting firms in the case of Glückler’s work) to maintain their competitive advantages.

In Sjøholt’s study, clients did see some the less successful experiences as a result of their own lack of focus and for underutilisation of the KIBS’ competence. Not surprising they were often prone to blame the consultants for any problems that did emerge. Sjøholt relates this to knowledge transfer mechanisms. One of the most common ways of interacting in knowledge transfer was by formation of team structures – but these were sometimes far from ideally composed. Professional teams with a generalist problem approach were formed, rather than teams with an explicitly transdisciplinary approach. Sjøholt suggests that the latter type of knowledge regime is increasingly imperative for handling contemporary organisational and strategic problems. Some tasks can, of course, be satisfactorily solved by the general practitioner, others (Tordoir’s sales relations) by the more specialised professional adviser. Well defined and controllable tasks of a more systemic learning nature are generally positively evaluated by the clients Sjøholt studied. The broader, more intangible strategic consultancy assignments, received more ambiguous assessments in terms of provision of value for money.

Work on client roles has been accumulating in recent years, after receiving limited attention before. Thus Hislop (2002) examines the role played by client firms in shaping their relations with consultants, drawing on case studies of four organisations implementing similar technological innovations. The client firms were found to play a key role in shaping their consultancy relations. Furthermore,
the character of the consultancy relations thus formed was found to influence the
innovation processes in substantial ways. The diversity of client behaviour found in
this study was interpreted by Hislop in terms of the social networks and
organisational cultures within which staff in the client firm were embedded. (An
example of how social network theory and Granovetter’s concept of embeddedness
may be used meaningfully in the study of KIBS.)

One of the most thorough discussions of client roles and strategies is provided by
Camal Gallouj (1997), who presents a synthesis drawing on the contributions of
several earlier scholars. He examines how clients selection and evaluate KIBS,
using a four-step model (derived from O’Farrell and Moffat (1991). (The
assumption here is that at least in principle, a new KIBS supplier could be
contracted for the required service.) For each step, a large number of methods that
may be used by the client are identified:

• **The search for general information on consultancy firms;** which may be
accomplished on the basis of past contacts, knowledge within the
organisation, examination of publications and conference presentations,
etc. Gallouj suggests that since search costs can be high, the client will
tend to look for a satisfactory solution, rather than making exhaustive
efforts to find the “optimal supplier”.

• **The evaluation of potential suppliers and the call for tender;** which may
be accomplished on the basis of applying selection criteria (KIBS’
qualifications, the nature of the problem, etc.) to a list of potential
suppliers.

• **The evaluation of tenders and shortlisting** to arrive at a set of (typically)
two to five consultants who will be invited to present their proposals.
This may be accomplished on the basis of the candidates’ display of
understanding of the problem, having proposed a valid and viable
approach to solving it, and of having appropriate experience and a
competent team available.

• **Presentations by the selected consultancies and the final choice,** which
is based upon a more detailed application of the criteria employed in
earlier steps, together with more attention to such issues as the precise
methodology and variations in it, the control of the project and scope for
delivery of results on time, the process of interaction that is feasible
between KIBS and client, etc.

Gallouj goes on to discuss the client’s use of “Institutions” – signals of the KIBS
quality that can help reduce uncertainty in the selection and evaluation of the
service provider (i.e., to limit the informational asymmetries). Examples of these include certification (qualifications, membership of professional associations, etc.), reputation (e.g. brand name, comments in the trade press), and various signals of quality. The client may also seek to impose contractual guarantees, and/or contingent contracts (payment is by results) to ensure that the KIBS delivers the service required. It may not be possible to establish best practice in the use of such mechanisms, across the wide variety of relationships that can exist in the use of KIBS, but this sort of detailed analysis serves as a guide to case studies and management practice alike. It also underlines the importance of establishing trust, that involves the use of mechanisms other than simple development of rapport in interpersonal relations! (The latter is termed “process-based trust”, as opposed to “character-based” or other sources of evidence as to trustworthiness.)

What we lack is detailed studies of KIBS-client interactions. One interesting example of what might be achieved here is the study by Webb (2002), who examined the process of communications between a large bank and the firms responsible for establishing a new email system for it, based on Lotus Notes. He establishes a generic model of four stages of the service process – preparation, codefinition, production, and operation of the service package, and examines the types of knowledge mobilised at each stage (Table 7).

The results have many interesting features. As the Table suggests, the various forms of knowledge involved include many that are specific to the service in question (and that are highly technical). Webb goes on to attempt to locate the knowledge interactions in terms of a Nonaka framework (in terms of conversions between tacit and explicit knowledge), and also discusses the specific mechanisms that are employed for particular purposes. For instance, some forms of information are transmitted through presentations, whereas know-how and other types of knowledge used in codefinition of the problem were exchanged using white board sessions. Yet other exchanges used teleconferences, emails and documents. These interactions also interface with the knowledge management processes in both client and KIBS.

This is an unusually rich and systematic study, and it will be valuable to extend the analysis into other cases. It could also be extended in terms of stages of the service process – for example, to an earlier stage involving clients’ search for KIBS and KIBS decision and implementation of the decision to prepare a tender, and to later stages involving maintenance and “aftersales” support. Across all of the stages, we can interpret what happens as involving processes of learning, as well as those of knowledge transfer. For example, the KIBS learns about markets for its services, ways of representing itself, the context and problems of the specific client, new
elements of generic knowledge, service delivery and assessment methods. The client learns about the KIBS supply-side, selection and appraisal methods, management of relationships with KIBS, the specific service innovation adopted, and so on. With further research, we would hope to build models that would encompass the types and functions of knowledge involved, the learning processes on the side of both parties, and the routines, media and mechanisms that are used to foster this. The task of understanding KIBS-client interactions thus emerges as one that requires detailed analysis.
<table>
<thead>
<tr>
<th>“Service package” delivery stage</th>
<th>Codified or embedded knowledge</th>
<th>Common knowledge</th>
<th>Social knowledge</th>
<th>Embodied or tacit Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– information of all kinds – facts and figures</td>
<td>– accepted as standard without being made formally codified</td>
<td>– of social links and shared values</td>
<td>– strongly related to the persons experience, background, and skill</td>
</tr>
</tbody>
</table>

### Preparation
- Systems and operational design
  - Service Definition
  - Service Design
  - Compliance Matrix
  - Terms of engagement
  - OLA and SLA
  - Terminology
- Operational process knowledge and ITIL standards
  - Project management standards and methods
  - Security standards
  - Notes practitioner knowledge
- Know-who holds specific knowledge and information
- System management from outsourced managed desktop ITT
- Know-how (Notes message service experience and best practice)

### Co-definition
- Network topology
  - Automated network design tool
  - Proposal presentation
  - Weighted evaluation criteria
  - SLA framework
  - Knowledge of the service offering and products
  - Consultancy brief
  - Consultancy contract
- Operational process knowledge and ITIL standards
  - Product and service knowledge within supplier KIBS
  - Communication network design
  - Project management standards and methods
  - Contracts knowledge
- Organizational awareness, knowledge of culture, values and delivery capabilities
- Social interaction and negotiation
- Know-who (e.g. contracts)
- Political (strategic decision)
- Know-what, Know-how, Know-where
  - Facilitation skills
  - Notes mail service – SLA experience
  - Supplier’s global networks, router configurations, protocols etc.

**Notes:**
- a Feeds into ITT
- b Feeds into Service Definition
- c Feeds into Service Description
- d Feeds into Service Level Agreement
- e External Network Design
- f Systems Design

**Source:** Webb (2002, Table 3)
<table>
<thead>
<tr>
<th>“Service package” delivery stage</th>
<th>Codified or embedded knowledge – information of all kinds – facts and figures</th>
<th>Common knowledge – accepted as standard without being made formally codified</th>
<th>Social knowledge – of social links and shared values</th>
<th>Embodied or tacit Knowledge – strongly related to the persons experience, background, and skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>– ITT and proposal</td>
<td>– Operational process knowledge and ITIL standards</td>
<td>– Know-who to contact</td>
<td>– Network addressing and router configurations</td>
</tr>
<tr>
<td></td>
<td>Systems topology</td>
<td>– Notes system design knowledge</td>
<td>– Social interaction and negotiation</td>
<td>– Practical experience of managing a Notes service</td>
</tr>
<tr>
<td></td>
<td>– Network design</td>
<td>– Communication network design</td>
<td>– Knowledge management culture “people, places and things”</td>
<td>– IT security</td>
</tr>
<tr>
<td></td>
<td>– SLA</td>
<td>– Accredited product knowledge</td>
<td>– Consultancy culture</td>
<td>– Know-how</td>
</tr>
<tr>
<td></td>
<td>– Contract and SLA templates</td>
<td>– Security standards</td>
<td></td>
<td>– Know-what</td>
</tr>
<tr>
<td></td>
<td>– Operational details</td>
<td>– Consultant “kit-bag”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Design templates</td>
<td>– Server power and memory estimates</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Support model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Policies, standards, procedures and guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>– Help desk procedures and escalation contact points</td>
<td>– Help Desk Practitioner knowledge</td>
<td>– Know who to contact</td>
<td>– Tacit problem resolution approaches</td>
</tr>
<tr>
<td></td>
<td>– Codified help-desk Scripts</td>
<td></td>
<td>– Local country cultural and language issues</td>
<td></td>
</tr>
</tbody>
</table>

Notes: a Feeds into ITT; b Feeds into Service Definition; c Feeds into Service Description; d Feeds into Service Level Agreement; e External Network Design; f Systems Design

Source: Webb (2002, Table 3)
4 Conclusions

4.1 A first point

A recent report to the European Commission (LLA, PREST, ANRT, 2003) concludes that the emergence of the knowledge-driven economy is transforming innovation processes, and that not just innovation policy, but a whole range of other policy fields that bear on innovation (labour markets, competition, etc.) need to take account of these changes. Simultaneously, however, these fields are themselves being transformed by regulatory reform and other pressures. The implications for the treatment of innovation by various policy domains are poorly understood. The conclusion is that mechanisms need to be instituted to allow for examining, and co-ordinating action on, the interfaces between innovation and other policy areas. Experts from the various policy domains, together with innovation and innovation policy experts, need to pool their understanding of the changes that are underway, and the likely cross-impacts of initiatives undertaken in specific policy areas.

A rather similar point applies to the topics discussed in the present study. Though there has been considerable growth of our knowledge about KIBS, and their interactions with their clients, in recent years, there is still much that we have very little knowledge of. Conventional research is, of course, needed. But research priorities, and policy issues, might well be explored effectively by groups that bring together experts in various domains as innovation policy, regional policy, the public knowledge infrastructure, and the like.

These groups will need to meet over a period in order to develop common understandings, and a shared language. They should aim to develop baseline views of the ways in which KIBS contribute to knowledge development and use, innovation, enterprise performance, and employment (and other domain-related topics). On this basis such groups should be able to determine how best the rise of KIBS can be taken into account in, say innovation and regulatory policies, where there are needs for further research, and so on.

This is a key recommendation. Other conclusions are necessarily more tentative! Research required into many topics – including relevant policies. It is important to appraise and document KIBS-related policies more thoroughly. At present this task has hardly been begun. Research is required to cast light upon many topics where
decisions are more informed by anecdote or simplistic analysis than by empirical evidence. Policy areas demanding attention include, for example:

- Support to KIBS clients to aid their “absorption capacity” and indeed their capabilities to define KIBS needs and select among suppliers.

- Support for SMEs and regions that may be disadvantaged in KIBS use.

- Intellectual property rights – there are debates about whether various formal IPR mechanisms should be promoted as a means of stimulating and protecting returns to innovation. Green et al (2001) point to the use of shorter lived patents as a way of protecting intellectual property rights without too adversely affecting innovation and the diffusion of innovation.

- Support for innovation within KIBS, and the application of innovation and knowledge management and related strategies in these firms.

- Improvement of the infrastructure used by KIBS, (e.g. relevant telecommunications infrastructure).

- Improving market transparency through schemes for quality certification (voluntary or otherwise), support for internationalisation, etc.

- Removing or restructuring market regulations that create barriers to entry and opening up markets to foreign competition, or, inversely, promoting export of business services.

We shall discuss these, and a few other major issues for research and policy, under a small number of headings below. The discussion is far from exhaustive, as will be apparent.

4.2 Human resources

KIBS staff are crucial to the production and use of KIBS knowledge, and in dealing directly with clients, and having to fuse knowledge of service techniques with client requirements. Consequently, the need for a well-educated workforce is fundamental, and policies need to take this into account.

23 Green et al (2001)
Training should enable service personnel to work better with innovations, and it could also help the staff of service firms be more proactive with respect to innovation. Of course, KIBS already draw heavily on qualified staff, but their qualifications are often fairly limited. For example, professional services might be encouraged to train their workers to take full advantage of new technologies and to accept and stimulate innovation more generally. (Are professional workers particularly averse to using new technology – or is it rather that they want to ensure that innovations do not detract from their own autonomy and existing valuable skills? If the latter, how do they come to form views as to the implications of innovations, and how accurate are these?) One of the reasons cited for not training staff is the danger of competitors’ free riding and poaching behaviour, recruiting workers who others have invested in training. This may reduce the number of enterprises engaging in training, and/or change the nature of that training (e.g. making it more basic, or more company-specific and less generic). If this found to be a significant problem, then incentives for training – perhaps through training subsidies, or through the provision of tax breaks for training – might be increased.24

Public sector organisations can be encouraged to play roles in KIBS training (and to stimulate uptake of training where demand seems to be low, for example by charging low or zero fees to the trainees). However, the question arises of how far training agencies, and associated parts of further and higher education, display a manufacturing bias such that their courses do not sufficiently feature services innovation. It would be worth examining course provision to ensure that the particular mixes of organisational, interpersonal and technical skills – and entrepreneurial attitudes – required by services, and KIBS in particular, are adequately generated.

Training systems need to adapt so as to equip people for the volatile new career structures of the twenty-first century, and the particular demands of KIBS for combinations of technical, cognitive social, interpersonal, and self-organisational skills. Traditional HEI departments (whose disciplinary structures probably fail to address these combinations), and vocational systems alike require more sophisticated knowledge of KIBS requirements.

The management of KIBS workers requires systems of governance to increase the quality of human resources, rather than the control of the workforce. KIBS typically follow an “apprenticeship” model of training (Toivonen, 2000) and good practices here need to be assessed and generalised. (There may also be challenges...

---

24 Other possibilities are levying training charges on firms that fail to invest in training themselves; or the provision of compensation for firms who lose their trained employees to competitors.
in terms of equal opportunities, for example, from such a personalised form of training!). Policies for supporting the development of such systems and practices might be developed.

As with the other topics to be dealt with below, we can see here some directions for policy development – but also numerous unanswered questions that deserve further research!

One important development that seems to be underway in many service activities, not just KIBS and KISAs, is the **professionalisation and semi-professionalisation of services**. Professional organisations and networks can be important in terms of organising training, setting quality standards and awarding credentials, and as channeling information about sector-specific and generic innovations. Professional associations allow service firms to benefit from a collective voice, opportunities to articulate their points of view, to participate in standardisation processes, and to develop their own quality standards and quality control mechanisms. Stimulating the creation of such fora is an appropriate target for policy. There is a trend towards greater professionalism in many KIBS, driven by such factors as regulations and standards. (These may be set by public authorities or by professional associations: the aim is to aid clients faced with the difficulty of evaluating service quality in advance of purchase, by specifying what services are provided, how and at what cost.)

However, not all professional bodies are keen on innovations, especially organisational innovations which they see as imposed from outside. Policymakers could play a role in encouraging professional associations to be more proactive in sharing good practice and diffusing knowledge of innovations. This may require different approaches to policy formulation, so as to win the support of such bodies.

Professionalisation can be a barrier to innovation, or at least a factor that shapes it substantially – often so that the professionals affected maintain their status and privileges. Professionalism is often used as an entry barrier – and obstacle to change, limiting innovation. The picture is very mixed, so that it is hard to generalise about all professions, or even about the situation of one profession at different times or in the context of different innovations. One common approach that may often be appropriate, nevertheless, is encouragement of the formation of semi-professional workers. (The models might be para-legal and para-medical staff, and various categories of teaching assistant and technical assistant.) The introduction of these categories of personnel should in principle reduce the price of some sophisticated services (though I at least one of the cases cited, clients suspect that they continue to pay for professional expertise while the task is actually
accomplished by paraprofessionals!). There is even scope for maintaining or even enhancing service quality, and for an enhanced division of labour to spur further innovations. However, again the general policy direction needs to be further specified – and qualified – in the light of more knowledge about the way in which professionalisation and semi-professionalisation operates in various circumstances.

4.3 Regional issues and SMEs

The uneven regional development of KIBS may be creating or reinforcing inequalities. There may be scope for promoting KIBS development in peripheral regions, by means of a variety of policy measures. These might include locational incentives, or action to aggregate demand from potential users so as to establish a critical mass of use. It is also important to explore the extent to which transport and IT links can help to substitute for physical presence, and whether there are facilities which could further aid this process (telecommunication and rail facilities, temporary office space, etc.) KIBS could be encouraged to change their orientations so as to more adequately serve SMEs. The nature of the advice and other inputs they make will often need to be tailored to the specific circumstances of SMEs; policy support might be provided to assist with this process.

Most KIBS sectors are themselves dominated by SMEs. It is likely that such small service firms often fail to recognise that they are eligible for programmes that support innovation and training, or for the invitations to join innovative networks. Likewise, the implementers of such schemes may fail to frame or address their messages to such firms. An area for policy design, then, is to minimise this tendency.

SMEs use of KIBS has been limited, as such services have tended to orient themselves to servicing large companies, too. (There are some exceptions, e.g. specialists in niche markets in IT services.) SMEs cannot (or believe that they cannot) afford KIBS inputs; and may well have problems in defining their needs, identifying appropriate providers, assuring themselves that these suppliers will really address their needs. Policy measures can support SMEs in these respects, underwriting some of the costs of KIBS, providing quality-assured specialists, demonstrations of the scope for SME use of KIBS via schemes introducing sectoral user communities to appropriate services.
4.4 **KIBS as a critical sector**

KIBS deserve special attention, not only as sources of innovation and agents of knowledge transfer, but also as being dynamic and rapidly growing sectors. In general the systemic roles of KIBS need to be recognised in innovation policies. Additionally, an important issue for policy to bear in mind is the potential for conflict between parts of the public sector, newly privatised or marketised RTOs, and KIBS. As these converge in elements of service delivery there may be unfair competition developing, which will need to be addressed.

Since KIBS often need to collaborate to develop and realise innovations, means of fostering better networking should be developed – especially for KIBS in more peripheral areas. This can be important, too, for KIBS confronting the challenges of internationalisation. Both formal consortia and looser partnership arrangements can support “exports”, and themselves are liable to be forged in the context of such networking frameworks as business and professional associations (Shrimpton et al, 1998 discuss this in the context of KIBS) be critical to penetrating some markets, and work especially well with IFIs. Business associations are important forums for establishing opportunities for such arrangements.

The process of interaction between KIBS and their clients requires much more in-depth study. This is likely to yield implications for management strategy (especially knowledge management) as well as for policy (in terms of training, support for clients, etc.).
Bibliography


Bordeleau, Y. 1986, La fonction de conseil auprès des organisations, Chotard et Associés, Agence d’Arc Inc, Montreal.


European Commission (1989): The efficiency of business services used by manufacturing industries, MRB-Study. – Brussels/Luxembourg; European Commission.


Shrimpton M et al 1998, Small Places, Big Ideas: Exporting Knowledge-Based Services from the Atlantic Periphery Centre for International Business Studies, Faculty of Business Administration, Memorial University of Newfoundland (available at http://www.mun.ca/cibs/EKBS/ekbs1.htm).


Some additional bibliographic references that appear relevant but that have not yet processed:


Knowledge Intensive Services' Suppliers and Clients (Tietovaltaisten palvelujen tuottajat ja käyttäjät)

Tiivistelmä


Yritysten innovaatiotoiminnalle palvelut ovat entistä tärkeämpiä, ja kiinnostus aihepiiriä kohtaan on viime vuosina kasvanut. Tehdyt tutkimukset ovat valtaosin koskeneet asiantuntijapalveluihin erikoistuneita yksityisen sektorin yrityksiä. OECD:n hanke tuo mukaan julkinen sektorin asiantuntijapalveluiden sekä asiakasyritysten omien, sisäisten palvelutoimintojen näkökulmat.

Kauppa- ja teollisuusministeriö tilasi hankkeen tueksi professori Ian Milesilta selvityksen tietotekniikkaa koskevasta tutkimuksesta. Professori Miles Manchesterin yliopistosta on alan johtavia asiantuntijoita. Raportissa esitellään tiivisti tutkimusaloittain innovaatiotutkimuksen kannalta tärkeimmät tähänastiset tutkimustulokset.

OECD:n tutkimushankkeen kannalta erityisen hyödyllistä on asiantuntijapalveluiden tuottaja – käyttäjäsuhdetta koskevan tutkimuksen kattava esittely.

KTM:n yhteysenkilö: Teknologiaosasto/Pentti Vuorinen, puh. (09) 1606 3748

Asiasanat

tietovaltaiset palveluyritykset, tietotekniikkapalvelut, innovaatiotoiminta, innovaatiotutkimus
<table>
<thead>
<tr>
<th>Författare</th>
<th>Publiceringstid</th>
<th>Uppdragsgivare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor Ian Miles</td>
<td>November 2003</td>
<td>Handels- och industriministeriet</td>
</tr>
<tr>
<td>University of Manchester, UK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Referat</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD:s kommitté för vetenskaps- och teknologipolitik startade år 2002 ett treårigt forskningsprojekt vid namn KISA som handlar om kunskapsintensiva tjänsteverksamheter inom olika produktionssektorer. Australien och Finland är samordnare av det multionationella forskningsamarbetet. Som stöd för projektet beställde handels- och industriministeriet en utredning om forskningen i kunskapsintensiva serviceföretag av professor Ian Miles. Professor Miles från universitetet i Manchester är en av de ledande experterna på området.</td>
</tr>
</tbody>
</table>


Kontaktperson vid HIM: Teknologiavdelningen/Pentti Vuorinen, tfn (09) 1606 3748

Nykkelord  
kunskapsintensiva företagstjänster, informationstjänster, innovationsverksamhet, innovationsforskning

<table>
<thead>
<tr>
<th>ISSN</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1236-2352</td>
<td>951-739-740-2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sidoantal</th>
<th>Språk</th>
<th>Pris</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>Engelska</td>
<td>17 €</td>
</tr>
</tbody>
</table>

Utgivare  
Handels- och industriministeriet

Förläggare  
Edita Publishing Ab