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Innovation in seven european countries

the results of work package 3-4 of the SI4S project

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FORSKNINGS 99:1 RAPPORT

Innovation in Services
In seven
European Countries

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**INNOVATION IN SERVICES IN SEVEN EUROPEAN
COUNTRIES**

**THE RESULTS OF WORK PACKAGE 3-4
OF THE SI4S PROJECT**

**by Jon Sundbo, RUC, and Faïz Gallouj, IFRESI-University of Lille
on the basis of national reports and surveys**

**SYNTHESIS REPORT FOR THE EUROPEAN COMMISSION, DG XII,
TSER-SI4S (INNOVATION IN SERVICES, SERVICES IN
INNOVATION)**

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LIST OF THE NATIONAL REPORTS

Denmark	Jon Sundbo <i>Innovation in services. Denmark</i> Roskilde University, Centre of Service Studies (RUC),
France	Faïz Gallouj, Faridah Djellal and Camal Gallouj <i>Innovation trajectories in French services industries</i> IFRESI (Institut Fédératif de Recherche sur les Economies Industriel Université de Lille I
Germany	Brigitte Preissl <i>Service innovation in Germany</i> Deutsches Institut für Wirtschaftsforschung (DIW)
the Netherlands	Pim den Hertog and Rob Bilderbeek <i>Recent innovation patterns in services in the Netherlands</i> TNO Centre for Technology and Policy Studies
Norway	<i>First SI4S report on innovation in Norwegian services: studies of 5 selected service industries</i> STEP group
Sweden	<i>Innovation in services - National profile report WP3-4</i> Department of Technology Policy Analyses, NUTEK Analys
the UK	Paul Windrum, Kieron Flanagan and Mark Tomlinson <i>Recent patterns of service innovation in the UK</i>

1. INTRODUCTION

1.1. The topic and its importance

This report presents the results of work package 3-4 of the SI4S project. This work package concerns the "innovation in service" aspect, i.e. what innovation in service industries is, how service firms innovate and the conditions for and impacts of the innovation process. It is a synthesis of national reports from seven European countries: Denmark, France, Germany, the Netherlands, Norway, Sweden, the UK. An overview of the national reports and their specific content is included in the appendix.

As the service sector counts for between 60 and 80 per cent of the GNP (cf. the national reports) and the service sector may get a leading role in economic growth and development, innovation is as important in services as in manufacturing. However, innovations in services have been characterised by two facts: 1. They have not been much studied, so our understanding of them has been poor. 2. Service firms have traditionally been little innovative compared to manufacturing firms - according to the national reports even if that conclusion should be shaded by the notion that innovation in services have been for a long time underestimated because of its relatively specific nature (which means that they are often incremental solutions of specific problems). Further, their innovation process is in some respect similar to that in manufacturing, in other respect different from it. The reports also tell that service firms are improving their innovation activities, but that they need to develop organisation and management of the innovation process and the innovation awareness could still be increased in many service fields.

Our understanding of, and thus research in, the service innovation processes is poor. This report is a step in the direction of a greater understanding and maybe development of operational models that firms and political authorities could use.

1.2. The SI4S project and the basis for this synthesis

1.2.1 The SI4S project

The project is one under the TSER programme launched by the EU Commission in 1995. The SI4S project aims to develop concepts, empirical evidence, and proposals for practical action concerning the role of services in European innovation system. The project includes studies of innovation activities in services themselves as well as service firms' role in creation and diffusion of innovations in other sectors. The first issue is investigated in what has been termed work package 3-4 which is reported in this synthesis, the latter has been termed work package 5-6 and is reported in separate reports. A work package 2 concerns statistical description and analysis of the macro service development and is also reported in a specific report (Preissl, 1996).

The project started in March 1996 and ended in June 1998. Research teams from nine European countries participate in the project. These countries are: Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Sweden and the UK. Centre of Service Studies, Roskilde university (RUC) in Denmark and Institut Fédératif de Recherche

Economique des Sociétés Industrielles (IFRESI), Université de Lille 1 in France have been the coordinators of work package 3-4.

The research institutes involved in work package 3-4 are listed in the appendix.

1.2.2 The basis for the synthesis

This synthesis has been worked out by the WP3-4 module leaders, Jon Sundbo, RUC, and Faïz Gallouj, IFRESI, on the basis of the national reports and reports from some country in which surveys on service innovation have been carried out.

1.3. The sources of the data

1.3.1. Types of data

The synthesis is based on two types of data. The first type is national reports which give an overview over existing research results at the macro (national) level, and investigates the situation and recent development at the meso (industry) and micro (firm) levels. In the project, reports have been carried out in the following countries: Denmark, France, Germany, the Netherlands, Norway, Sweden and the UK. The appendix contains an overview table of the topics treated in the national reports.

The sources of data and methods used to achieve the first part of work package 3-4 are the following ones :

At the macro level:

- public statistics
- sectoral and industrial statistics
- data from the research literature (literature on national empirics rather than national literature)
- existing surveys

At the meso level:

- expert key-interviews : interviews with industrial or sectoral representatives (representatives from organisations, government administration, etc.)
- existing analyses and investigations

At the micro level:

- case studies (of service firms and/or service innovations) based on interviews

All data has been collected through 1996 and 1997, but some of the documentary data describes earlier conditions. The other type of data is surveys to a sample of service firms in Denmark, France and Norway. The data have been collected through postal questionnaires with standardised questions. Most of the questions in the questionnaire have been asked in all three countries, but has been linguistically applied. Some questions have been specific to each country.

1.3.2. Service industries

The national reports and the surveys deal with different service industries. In the total material is included data on the following service industries:

- * Wholesale and retail
- * Transport
- * Telecommunication services
- * Communication, publishing and entertainment services
- * Postal service
- * Hotel and restaurant
- * Tourism
- * Finance
- * Estate agent
- * Business services (e.g. consultancy, accountants, lawyers, Information and Communication Technology (ICT)-services, marketing, technical services)
- * Engineering consultancy
- * Machine tool trade and service supply
- * Architecture
- * Cleaning and other operational-physical services (e.g. catering, gardening, building maintenance)
- * Health care services
- * Ambulance, fire, car breakdown, guard service
- * Community and social services
- * Public administration

1.4 The structure of the synthesis report

First we will try to define what innovation in services is (section 2). This section will also be devoted to a closely related issue, namely : innovation indicators. Then we will present two models of the forces that drives innovations in services in section 3. These models are a synthesis of the driving forces that the national reports and the surveys have found. Afterwards we will present and discuss in section 4 the general development trends in the service firms' innovation activities as it has been the last five to ten years according to the national reports and the surveys. This will be done by analysing three routes that the changes in innovation activities in service firms follow. Next, the effects of the innovation development analysed in section 5. The last section is devoted to the role of the public sector and to political implications of the results.

2. DEFINITION AND TYPES OF INNOVATION IN SERVICES

2.1. Definition of innovation in this project

It is not obvious that the innovation concept can be applied to services since it has been developed from studies of the manufacturing sector. However, this study confirms the conclusion of a few other studies (Barcet, Bonamy and Mayere 1987, Gallouj, 1991, 1994, C. and F. Gallouj, 1996, Gadrey et al. 1993, 1995, Miles et al. 1994, Sundbo 1992, 1996, 1997) that service firms innovate and the innovation concept can be applied to services, but there are specific characters of service innovation.

By an innovation we mean a change of business by the addition of a new element or a new combination of old elements in the Schumpeterian meaning (cf. Schumpeter, 1934). The innovation must be a phenomenon of some dimension before it can be defined as such. This means that the change must be reproduced, for example as when a solution of a customer's problem (a service "product") is re-used to solve other customers' problems, or when a change in the procedures is introduced in general in the firm, and not only by one occasion. A discipline within service management and marketing theory focuses on the customer encounter and quality problems in the service delivery (Grönroos, 1990, Edvardsson et al., 1994). The discipline operates with the concept of service design or development (Shostack, 1981, Gummesson, 1991) which characterises the process of designing new solutions to the customers problems, which implies new service production and delivery procedures. If the solutions and new procedures are repeated, the renewals are included in our definition of service innovations, but if they are implemented only once, they are excluded from our definition of innovation.

Single one-shot solutions to customer problems may be important and we have therefore in the project attempted to investigate whether the development goes towards more innovation in the above definition or single one-shot solutions are the most important to service firms.

2.2. Types of service innovations

In the project we have found different types of service innovations that can be categorised in different systems (for a survey, cf. F. Gallouj, "Beyond technological innovation : trajectories and varieties of services innovation, chapter 7 of Boden and Miles (eds), 1998).

We will here first examine the different types or typologies of innovation used in each national report and then draw some general conclusions.

Service innovations could be categorised into four types : product innovation, process innovation, organisational innovation and market innovation. Organisational innovations are new general forms of organisation or management such as introduction of TQM, self-steering groups etc. Process innovations are renewals of the prescriptive procedures for producing and delivering the service. The process innovation could be divided into two categories: innovations in production processes ("back office") or in delivery processes ("front office"). Market innovations are new behaviour in the market, e.g. finding a new market segment, entering another industry and its market (as for example retailing starting selling bank deposit accounts).

One could add another one which is called ad hoc innovation and which seems to play a great role especially in knowledge intensive business services. Ad hoc innovation is defined as the interactive (social) construction of a solution (strategic, organisational, social, legal, etc.) to a particular problem posed by a client. This type of innovation is co-produced by the client and the service provider. It is not reproducible as such but indirectly through the codification, the formalisation of part of the experience and the competence.

In conclusion, we can say that with some adjustments the well known schumpeterian typology of innovation can be used to take into account innovation in services. Adjustment may mean adding other types or more on some sub-types or giving a broader sense to existing types : for example product and process innovation will take into account immaterial product and process innovations (service product, methods).

2.3. What are the specificities of innovation in service ?

The detailed specificities of service innovations will be investigated throughout the report, but some general characteristics of service innovations can be stated already here.

Service innovations may be technological innovations, but are more often than in manufacturing non-technological or social innovations. Service innovation could not be understood from a too narrow technology-determined view. Service innovations may be the creation of new knowledge or information, if knowledge or information service, or new ways of handling things or persons, which are just new types of behaviour by the service personnel. Service innovations are often small adjustments of procedures and thus incremental and rarely radical. The development time for service innovations is generally relatively short since there is no need for research or collection of scientific knowledge. Service innovation processes are normally very practical.

Service innovations can be a new service product, a new procedure for producing or delivering the service or the introduction of new technology. Since service in most cases cannot be stored, it must be produced in the moment of consumption (cf. Grönroos, 1990, Eiglier and Langeard, 1987). This means that the procedure cannot be completely separated from the product, which leads to the conclusion that it is difficult to change the product without changing the procedure. Thus, service innovations are generally broad in the sense that they imply a change of many elements in the production process and the products simultaneously.

One could from the service management and marketing literature (e.g. Norman 1991, de Bandt and Gadrey 1994) assume that the customers and the solution of their problems were so important that innovations in service firms must be explained from the customer side - an extreme pull orientation of the innovation process, for example by creating a model of customer clustering with different customers groups in the centre. Service innovations are customer oriented, but they are also often developed from ideas within the service firm - push oriented. The ideas may have evolved from the interaction between service personnel and customers, but are not directly presented by the customers nor directly answers to one single customer's concrete problem. To which degree the innovations are very customer-determined is different in different service industries or segments. Within standardised services such as cleaning or bank services the innovations are less customer-determined than within for example advisory services, which is much more individual to the single customer and less standardised. In the latter is innovation, if business service, often an interaction process between the service provider and the customer and the development of the innovation is taking place within the customer firm.. Both part may learn from the innovation process and exploit it, the customer firm by having solved some problems, the service provider can generalise the solution and sell it to other customers.

Innovations within services are more incremental than radical, often they are very small changes. Only few of the renewals that the service firms themselves consider as innovations are new to the market. In the surveys in France, Denmark and Norway the firms were asked to give examples of "major changes" (which was the operationalised expression of innovation). The examples given demonstrate that development of service firms have many facets and innovations can be of very different kind: Product, process, organisation and marketing innovations.

Examples of what the service firms interpreted as innovations in the Danish and French surveys:

New accountancy methods
 Development of service management system
 Distribution of special goods: Transport of art
 Establishment of network with firms in other EU countries
 New PC product with graphic user-interface
 Publication of home catalogues on the internet - "Find your own home"
 New cleaning methods
 "Expertisation"
 Introduction of health attest of houses
 EDI network with the largest customers
 BPR project
 New strategical market alliance
 New advisory services in environmental issues
 Export to Germany for sale to Danish customers (cheaper customs duty and tax)
 New types of expertise fields
 New financial or insurance policies...

As we can see, the innovations stated by the firms themselves are very differentiated, many of them are not technological and exact, but behavioural and broad. Most of them do not look like the typical example of a technological manufacturing innovation. It raises a series of methodological and theoretical questions such as:

- Are the measurement of innovation valid (there may be validity problems in measurement of manufacturing innovations as well)? This question is important to discuss for the statistical bureaus in Europe which actually attempt to create a European measurement of service innovations.
- Should we adopt a broader concept of innovation when studying services? This issue concerns not only the type of innovation (e.g. that non-technological innovations are the most frequent), but also whether the innovation is new to the world or a country, or we should accept that it only need to be new to an industry or the single firm.
- Does this lead to a new innovation theory that emphasizes the broad social, organisational and other "soft" aspects is needed (cf. discussion in for example Gadrey et al. 1993, 1995, Miles et al. 1994, Sundbo 1997, 1998 ; Gallouj, 1994,; 1996, 1997, Gallouj and Weinstein, 1997). Such a new theory might even give a more adequate explanation of contemporary manufacturing innovations.

These questions are further discussed in a theoretical book that has been one result of the SI4S project (Boden and Miles (eds), 1998).

2.4. Innovation indicators

An issue of interest to researchers and statistical departments is whether indicators that can measure the innovation activity within service industries are, or can be, established. This question has been investigated by several of the national reports.

The establishment of such indicators is difficult. Some of the reports mention some traditional innovation indicators as are used in manufacturing, R&D expenditures, R&D staffs and other measures related to R&D. There are problems in using these indicators since very few service firms have formalised R&D departments although many have R&D activities, or at least innovation activities although they are rarely as science based as in manufacturing. Different results come up when different of these indicators are used. The reports conclude that there are problems in using such indicators.

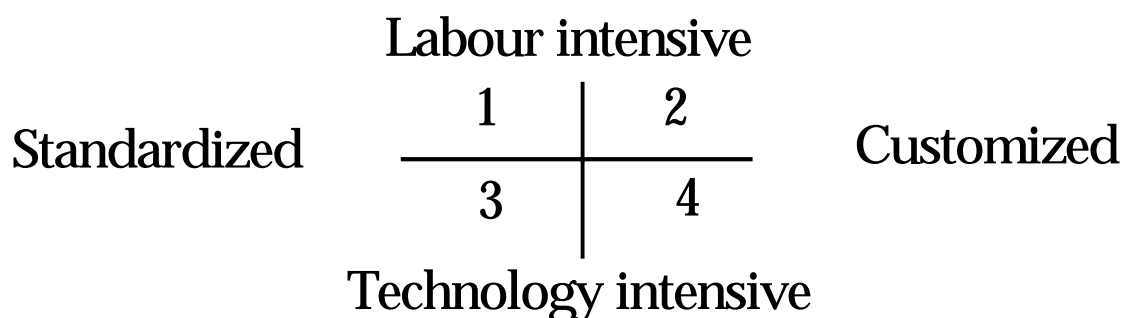
There is also measures that include non-R&D activities such as acquisition of patents, training, market research etc. Some investigations use the number of high educated people employed in different industries as a macro indicator and sometimes a measure of innovation expenditures that includes more than R&D expenditures is used, namely costs related to development and marketing. These measures give more relevant information, but still they do not express the total innovation activities. The conclusion is that no sufficient indicator has yet been found and more work is to be done here.

3. THE DRIVING FORCES

3.1. The general tendency to unite the incommensurable: increased productivity and individual customer care

Service industries and firms are different. Several categorisation systems have been used to characterise the differences. There is a difference between small and large firms. Some service firms delivers business services (to firms), other consumer services (to private households). Some sells knowledge services, others manual services (e.g. transport or cleaning), the latter can be devised into physical services (handling things) and personal services (handling persons). Many firms provides a mix of these forms.

The model below can be a means understand the general development tendency in service activities, and therefore to understand the development of the innovation activities:

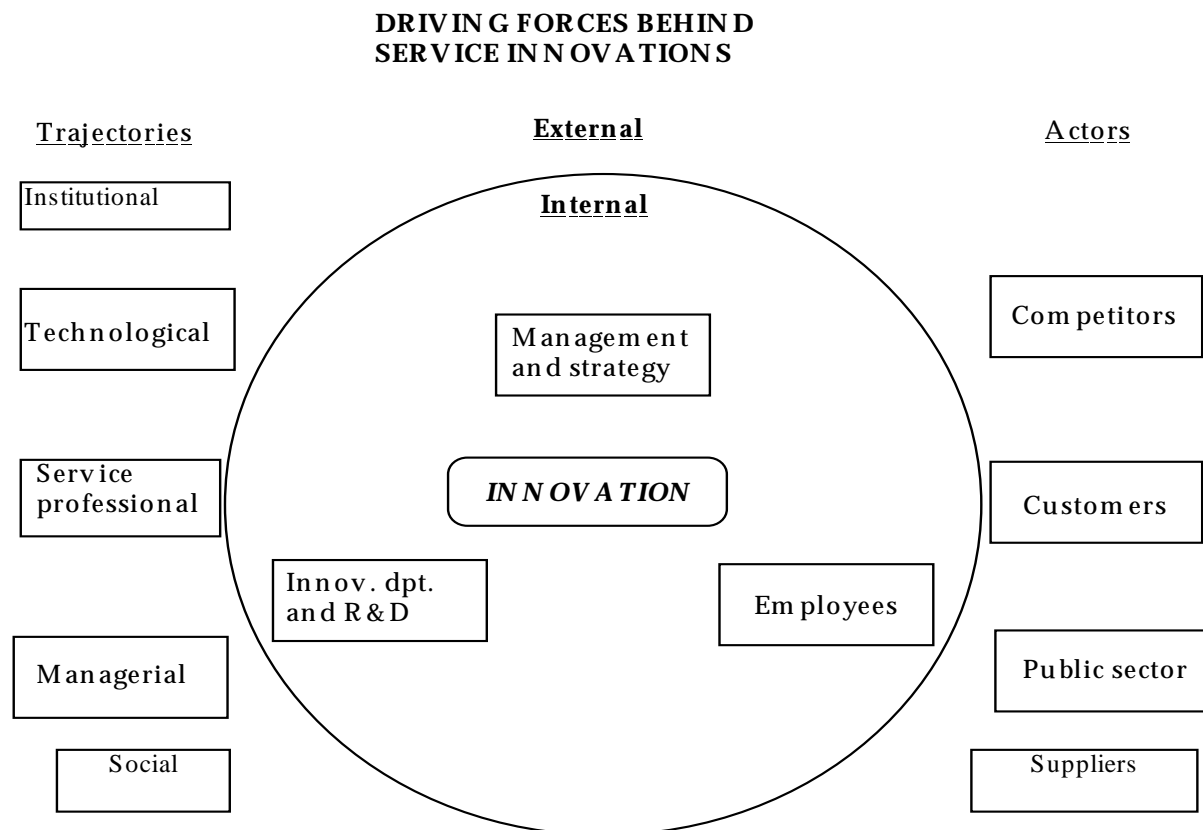


The service production can be standardised, and will then normally be a mass service, or it can be individualised, which means that it is a "tailor made" individual solution to the single customer's problems. There can also be more or less technology involved in the service production and delivery. Complementarily, the service will be less or more labour intensive.

The service activities have traditionally mainly been concentrated in two types, number 2 and 3 above, where category 2 is the typical knowledge service, which has an individual advisory character. Category 3 is the typical mass produced service, which has formerly mainly been manual services (e.g. transport).

3.2. A model of the driving forces

The driving forces found in the national reports and the surveys can be summarised in the following model:



There are external and internal driving forces. The external forces can be divided into *trajectories* and *actors*.

- *Trajectories* are ideas and logics that are diffused through the social system (being a nation, an international network, professional networks etc.). They are often diffused through many and difficult identifiable actors. They correspond to the (dynamic) environment. The importance is however not the actors, but the ideas and the logic behind the ideas. There may be identified three types of trajectories. The most important is service professional trajectories by which we mean methods, general knowledge and behavioural rules (e.g. ethics) that exist within the different service professions (e.g. lawyers, nurses, catering (how to cook)). Another type of trajectory is general management ideas or ideas for new organisational forms such as motivational systems, BPR, service management etc. The third type trajectory is technology trajectories. New logics for using technology that generally influences service products and

production processes. Examples are the ICT wave and more specific the Internet, the freezer and microwave oven which has created a new distribution system within catering.

We could add two other linked trajectories : the institutional trajectory which describes the general trend of evolution of regulations and political institutions (for example : the european construction, the european research programs) and the social trajectory which displays the evolutions of general social rules and conventions (for example : ecological and environmental consciousness). Thus the social trajectory can fit or not with the technological trajectory. It seems for example that nuclear technology lacks the kind of social acceptability which it requires to become a genuine paradigm such as microelectronics.

- *Actors* are persons, firms or organisations whose behaviour has importance to the service firm's possibilities for selling services and therefore also for their innovation activities. The actors defines the market possibilities and they are sometime involved in the development of the innovations. Customers are of course actors of major importance. Competitors have also importance for the innovation activities. Service firms may imitate competitors' innovations, and since service industries generally not have been characterised by offensive innovation strategies, a condition for starting an innovation activity has often been that the competitors should be moving. The public sector is the least important actor, but nevertheless an actor of some importance. The public sector demand services, and it delivers research and education necessary to innovation activities.

Suppliers and especially KIBS suppliers are important sources of innovation as well. To complement the two well-known schumpeterian models of innovation (Schumpeter mark I and Schumpeter Mark II), it is possible to define what could be called “ a consultant-aided model of innovation ” (cf. Gallouj, 1994). Therefore, KIBS or some of them or in some situations may be considered as a new locus of the “ Schumpeterian enterprise spirit ”.

There are three internal forces. The management of the service firm often has a strategy or an idea of the direction in which the firm should develop. This often includes ideas of innovation activities, or at least it set up some limitations of these activities. Management could be the top manager, but is often the management of the marketing department since service innovations very often is market driven and the marketing department, which has the direct customer contact and market knowledge, is the leading actor in innovation activities. Another driving force is formalised R&D departments or other type of formalised department which has the responsibility for ensuring that innovations will appear. Since the innovation process in service mostly is a loosely coupled process in which the employees are involved, or they just function as corporate entrepreneurs and start the process, they are the third internal driving force.

4. THE DEVELOPMENT TENDENCIES IN MANAGING AND ORGANISING SERVICE INNOVATIONS

The most conspicuous result described in the national reports is a development trend in the service firms' innovation activities. The dynamics of the service sector is changing. The general tendency is that, while service firms generally have had an unsystematic and somewhat casual innovation process, they are becoming more aware of the necessity to innovate and have started organising the innovation process more systematically. This tendency can be described as three routes which can be entitled as follows :

1. From peculiarities to service trajectories
2. From casual quick ideas to a more systematised strategic process based on ICT
3. The innovation organisation in service firms is naturally more flexible

Even though these are general routes that service firms follow, many service firms have still not been aware of the advantage of a conscious and systematic innovation activity, or if they have, they don't know how to organize it. This points to an effort for social sciences and policy to actively induce the development of a more proper innovation system within these firms.

4.1. From peculiarities to service trajectories

4.1.1. The service industries as innovative laggards ?

Service industries do innovate as all the national reports have demonstrated. However, service industries are in some respect different from manufacturing in their innovation patterns - what has been called "service peculiarities" (Miles et al. 1994). As we have already discussed it in chapter 2, services differ from manufacturing in several ways: Innovation in services does far from always mean technological innovations, they are often social. Service innovations are less radical than manufacturing innovations; they often not lead to complete new service products on the market, but are new combinations of existing services or small local modifications of existing procedures - what the French report calls modifications of services. Service innovations are more rarely science based than innovations within manufacturing, and one may say that R&D practically not exists within services, or that it exists, but has another, non-laboratorial, form than in manufacturing.

The general innovativeness is lesser in services than in manufacturing. The awareness is still lower and the German report characterises the situation as a service gap. The national surveys conclude that about 80% of the service firms have innovated. There is a cumulation effect: the more the service firms have innovated, the more types of innovation have they had (types: product, process, organisational, market innovations). We must, however, state that the validity test of the surveys tells that innovative firms probably is over-represented in the sample.

The larger firms, the more innovative they are according to the surveys. The most innovative industries (with the highest percentage of innovative firms) were: publishing, finance, business services, cleaning and the least innovative : health care, retail.

An earlier German survey to service firms shows that only 43 % considers innovativeness to be "very important" or "important" compared to 88% who characterised adjusting to customer requirements and high service quality as "very important" or "important". In all countries there were great differences between the different service industries with respect to innovativeness. Characteristically was ICT hard- and software firms those that scored highest on a "readiness to innovate" scale in a German survey. These are the service industries that come closest to manufacturing and the scientific and innovation culture of that. Also the Danish report mentions a relatively low innovativeness in services based on a large nation-wide evaluation.

However, the picture of services as "peculiar" laggards is changing. Service firms are fastly developing a new approach to innovation and are currently introducing many innovations as

all reports demonstrate. Measured by some indicators the service sector seem to be more innovative than manufacturing. Particularly in developing innovations based on ICT, the service industries seem to be ahead of manufacturing. Also R&D personnel could be interpreted as being relatively larger in some service industries than in manufacturing, but this an insecure conclusion due to the large statistical measurement and definition problems of R&D in services. The national reports emphasis the relatively important role played by social sciences in services R&D.

4.1.2 The emerging service professional and technology trajectories

The future understanding of innovation in services should not be that of "peculiarities", but one that sees service industries and service firms as innovative, and in the future probably as highly innovative. The service innovation follow their own trajectories which are different from manufacturing's - mostly technological - trajectories (cf. Dosi, 1982). These service trajectories will be constituted by traditional service sciences such as accountancy, law, organisational sociology etc., or by patterns of practical creativity and product development in service. These factors will in the service trajectories be combined with new patterns of market possibilities and technological opportunities in the constitution of new service trajectories.

Also the technology trajectories are becoming more important for the development of innovations in service firms. Particularly the ICT development is assessed to present great opportunities to service industries. The Danish survey has included a series of questions on service firms' use of ICT. 69% of the firms mentioned that mobile telephones and electronic mail are used to produce new services, 31% that EDI is used, 41% use home pages on WWW, 18% WWW with possibility of ordering and 5% with possibility of payment.

Other technologies have also had importance, for example transport technology in transport, kitchen technology in catering and chemicals as well as robotics in cleaning. There exist several non-ICT technological trajectories which has lead to service innovations, but these are not assessed to increase nearly as fast as driving forces as the ICT trajectories. However, there are several manual services where the ICT trajectories practically have no effect on innovation activities, because ICT is not a part of the core production and delivery technology (this is for example the case in cleaning and some personal service such as children care, hair cutting etc.).

We should add, but this will be empasized in WP5-6 synthesis that certain services, namely KIBS and especially ICT-KIBS play a very important role in the definition and the direction of the sociotechnological trajectory of their manufacturing clients' firms (Djellal, 1995).

We do not yet know which service trajectories will be the leading in the future. Even this project, which summarises most of the research on innovation in services done until now, has only presented the contours of this issue. Further research is therefore needed. The national reports contribute with a set of service development tendencies, which can give some ideas of the trends, obstacles and challenges for future service trajectories. They point to tendencies to integrated problem solutions, and to standardisation or modulisation, which means that service firms, without losing its crucial customer orientation, standardise different elements in the service product and the production and delivery process. This makes it more possible to innovate because the elements are identifiable and are reproduced, thus an investment in innovation activities is profitable. The Dutch report emphasises four trends: 1. Industrialisation (as mentioned above) and tertiarisation, which means that more functions will be allocated to market based service industries. 2. Specialisation and integration through

networks (mainly through the use of ICT network technology). 3. Dematerialisation and knowledge intensity, which means that knowledge will become a steady increasing part of the service products and production activities and manual (physical) elements a decreasing part. 4. Internationalisation and liberalisation; removal of international trade barriers will increase international service trade.

The future will not be a smooth, up-going cycle for the service industries. They are contingent upon the business cycles. The Norwegian report shows for example how this is the case to consulting engineering. Turbulent periods with much innovation activities changes with more stable periods with less innovation activities. This is a not an in-optimal situation since innovation is also a risky activity that firms will carry out only when it is necessary.

4.1.3 Entrepreneurship

The Swedish and Danish reports also show that concerning entrepreneurship - establishment of new firms - are the service sector ahead of manufacturing. Still, there are some problems connected to this since the new firms in all service industries in the Danish statistical material have a lower rate of survival than manufacturing firms. In the Swedish data only trade, hotels, restaurants and repairs had a lower rate of survival. They are typically industries with a very low entrance barrier thus it is easy for people to establish a new firm on a non-innovative basis, thus the firm has no market advantages at all.

4.2 From casual quick ideas to a more systematised strategic process mainly based on ICT.

Why service firms are innovative and why not have been investigated in the national reports. Causes of, and potentials for, innovations are summarised as is the barriers.

4.2.1 Causes and potentials

The national reports refer research results that point to factors which improves the firms' innovativeness: 1. A clear mission. 2. Informal communication. 3. Dedicated employees. 4. Customer collaboration. 5. Information technology

Some reports point to internationalisation of the service firm or its clients (if business service) as a factor that improves innovativeness because ideas are transmitted. The national reports give examples of internationalisation of service firms that have created a new dynamism within these firms. The surveys support the view that internationalisation, also in form of foreign firms entering the market, is an important innovation factor. The service firms that have competition from foreign-owned companies are more innovative than those who have not.

The reports also mentions the general increased interest for environmental problems as an innovation producing factor within environmental services. Also the public sector is an incentive for innovations as a political regulating actor that can stimulate innovativeness through support programmes, and as a large demander of services. Outsourcing of public services could result in a large number of innovations within private service firms.

An example of development of innovations within transport services refers to the following factors as important: 1. General growth in trade and liberalisation of international trade. 2. Changing transport demands (which again is a consequence of increased general economic activities in society). 3. Technical innovations (they can be innovations within transport directly or can lead to non-technical innovations). 4. Information system and organisational innovations.

The German report mentions that cost reduction is not generally an aim of innovation activities. The innovations are part of larger strategies of which the report mentions: 1. Product differentiation (innovation becoming development of new products). 2. Increased flexibility and response to customers problems, 3. Enhancing creativity as a competition parameter. 4. Opening up new markets (could emphasize market innovations). 5. Binding customers to the company (e.g. through delivery innovations). 6. Improving corporate identity and market positioning.

Innovation activities within services thus seem often to be related to the firms' strategies. The service firms often choose one of the following three main strategies: 1. Globalisation. 2. Specialisation (the firm provides more specialised services than before as when a cleaning company provides environmental cleaning instead of general cleaning). 3. Diversification (the firm choose a more narrow market segment like for example globalised food industry). Each strategy leads to different types of innovations.

The surveys have investigated the relationship between how many areas (product, process, organisation, market innovations) the firm has entered in relation to market characteristics.

Those that have entered several areas have the following market characteristics, compared to those that have not innovated or only in one area: Integration with supply of goods and after sales training and user support. There were no systematic differences concerning low price, quality, image or brand name and personal contact to customer. It seems to be when services are related to goods provision that it becomes most innovative. The very innovative service firms were slightly more characterised by the following market characteristics: Ability to adapt to individual customer needs, and delivery on time.

As far as knowledge intensive business services are concerned, the traditional distinction between demand pull and science push innovation is not satisfactory to analyse the determinants of innovation. One may suggest to distinguish between the following four determinants : social sciences, physical sciences, institutional determinants, and the need. The latter determinant is not homogeneous as far as we need to distinguish between an “ abstract need ” (the need of the whole market determined by the complexity and uncertainty of the environment), a “ concrete need ” (which is the specification of the abstract need at the level of a particular firm), the “ formulated demand ”, the “ rebuilt need ” (which means the reconstruction of the need by the service provider together with his client).

Innovations are in these situations not single events, but the result of a development pattern. This general development pattern even influences other important innovation activities. As an example of this, the UK report launches on the basis of the results a hypothesis according to which the service firms involves the customers more in the innovation process the more development oriented they are, which means that they are undergoing rapid technological and market reorientation. Customer involvement is an important feature, particularly in services since the customers are more involved in the production and delivery activities than in manufacturing.

This demonstrates again that many service industries are moving from innovation activities being mainly casual innovations based on quick ideas towards more systematical innovation activities. These are less based on science push than is known from manufacturing and more on market pull conceptualised in the firms' strategies. This route is in accordance with service as a production where the customer is involved in the production and delivery activities and where application to the single customer's specific problem in average is more important than in manufacturing.

4.2.2 Sources of ideas and information

The surveys show that the most important source is the customer, sales personnel and other employees. The more innovative the firm is, the more important are the customers as source. Suppliers of ICT play a very little role as do universities and consultants also. Ideas come from the customer oriented practice.

An earlier German survey has found a somewhat different result, namely that competitors and allied firms are the most important sources.

4.2.3 Importance of Information and Communication Technology (ICT)

Further, the importance of technology, ICT in particular, is stressed. Even though services are not as technology intensive as manufacturing, they imply technology as for example car, aeroplane and road building technology in transport. Many services, particularly knowledge

services such as accountancy, consultancy, training services etc., is increasingly based on the use of ICT. The reports point to several knowledge service industries as more contributing to ICT innovations than manufacturing. Even in services which are not directly based on ICT, this technology has an increasing role as for example administration technology or as sales channels (e.g. the Internet). The development of ICT and international ICT communication networks is a crucial factor in the evolution of the service innovation system. Not only do it create new possibilities in form of ICT based innovations, but it might also functions as a communication network through which ideas and information of customer need flow, and as a marketing channel through which new service products can be announced or directly provided (if they are information services).

ICT has within the service sector a role of being a means for development of service innovations. The ICT hardware innovations are taking place within the manufacturing sector.

The national reports describes examples of ICT based innovations in several service industries, e.g. retailing, communication services and financial services and software and health care services. However, ICT or other technologies are not equally important to all types of firms, and the degree of ICT implied in service innovations varies. Therefore, it is relevant to separate technological and non-technological innovations. The German report refers results of a survey which says that 5% of process innovations are technological within service industries where technology use is not normally standard, and 33% with in industries where technology use is standard. For product innovations the similar figures were 3% and 18%. Process innovations are more technology based than product innovations as the Danish report also shows. It further refers results from the financial services industry according to which 16% of all innovations (all types together) were technological while 30% were non-technological, but were dependent on technology (these innovations could not be implemented without technology). 54% were non-technological.

Particularly large service firms introduce much technology and use it as a means for developing service innovations while small and medium sized service firms are laggards. Technology might be diffused even to them through imitation of innovations developed within large firms.

ICT becomes important to service innovations also because all services becomes more knowledge intensive. The economy is not only becoming more based on service consumption, but it becomes increasingly a knowledge based service economy. ICT is a means to distribute and develop knowledge.

4.2.4 Different patterns in standardised and customised service production

There are industrial differences in the innovation pattern. It is connected to the model of standardised and customised service production presented in section 3.1.

The tendency is that the knowledge services are moving more towards category 4, becoming more technology intensive (due to ICT development), and, for some knowledge services, with a slight tendency to move towards category 3 and becoming more mass produced. This has for example typically happened with bank services. Many manual service industries are now in a situation where they, relatively, have moved more towards category 1 compared to knowledge services, because the ICT development has provided knowledge services with an instrument to automate production and delivery, meanwhile there in many manual services (e.g. cleaning and most personal services) have been a very moderate technology

development. At the same time has manual services been moving towards category 2 or 4 (depending on how much technology intensive they are) due to the general customer focus in all service productions.

The aim in many service firms is to standardise and technologize as much of the service production as possible. This will increase productivity, and it will make innovations easier because any innovation could be repeated (a new service product sold in many copies, a process innovation be used over long time by delivering many services by the same procedure). The service firms want simultaneously to maintain the strong customer focus, which means that the single customer should have his individual needs fulfilled. The solution of the dilemma is a tendency towards what in some national reports have been called modulization: standard product elements and standard production (back office) procedures, and the product elements can be combined individually by the customer plus the delivery system has a wide element of individual customer treatment.

Service firms that have a standardised service production develop the innovations more internally and the innovation process is more technology driven if ICT is a part of the production technology. More customised service firms have a less systematised innovation process and the innovation is more often developed in cooperation with the customer.

The surveys show that the innovativeness is largest when the service products are customised and least when they are standardise with the situation of modulized services in between. Many of the innovations in customised services seem to be ad hoc innovations (cf. Gallouj 1991) - non-repeated solutions of isolated problems, yet some of their "components" (knowledge, methods) can be reproduced in part.

4.2.5 Barriers to innovations and means of protection

The national reports conclude that the following barriers exist: 1. Lack of competence to develop innovations, i.e. lack of high educated personnel; this is particularly an obstacle within knowledge services, but might also be it in other services since more knowledge than presented in the first idea is often needed in development of an innovation. 2. Lack of protection of service innovations. 3. The tax system may be a barrier since it reduces the market potentials for new service products. 4. The market for venture capitals is not sufficiently developed.

Some report emphasize barriers in advise services, which are knowledge intensive. They find impediments in the clients: social-psychological factors (the client is too conservative), economic factors (new services are too expensive), competencies (the clients must participate in the production of the advise service, and a lack of competence will obstacle new solutions). It also finds obstacles in the service provider: individualisation factors (that advisors are individualistic and not ready to participate in a collective innovation process), social-psychological factors (even the consultant is too conservative), economic factors (the odds for a profitable launching of an innovation are too bad because the new service need to be very expensive), heterogeneity factors (that each advisory industry is heterogeneous; this hinders a critical mass in the launching of an innovation; further is professional protection and monopolism general). Finally, there are obstacles in the service development process due to the modes of management of the service and of the innovation in services : lack of input "materials" (some materials such as ICT or personnel with relevant competencies ; applicants in recruitment consultancy and law in legal consultancy are exogenous inputs which may be a barrier to innovation), launching difficulties (e.g. the client cannot wait for the innovation

being developed, the service provider cannot prove that for example a methodological innovation is useful and must be paid for), innovation protection difficulties, difficulties to obtain R-D tax cuts .

In the field of insurance services there are two generic types of barriers to innovation :

- “ natural ” barriers e.g. the insurance laws, the lack of really new risks in the field of life insurance beyond life, death and disability, the competition and domination of public social insurance, the lack of protection and the easiness of imitation ;
- barriers linked to actors strategies : information systems departments and distribution networks may for different reasons and in different situations be viewed as potential barriers to innovation.

Lack of entrepreneurship (a cultural factor) in services is an obstacle to innovation and so is linguistic and cultural barriers between countries. The latter is a barrier to collecting knowledge and new ideas from abroad and to launching new service products internationally, which else could increase the market possibilities.

The surveys observed the following factors as the largest impediments to innovation: Lack of qualified labour, lack of financial resources, lacking organisational ability to develop new ideas and insufficient internal expertise in applying ICT.

Thus, the barriers are partly cultural and competence based, partly economic. The latter type of barriers could be overcome through innovations if these includes process innovations that increases the productivity and makes the services cheaper. The first type of barriers are more fundamental, but as concluded above, the service firms seem on their way to remove the cultural barriers. The political actors such as states and the EU could contribute to remove the competence barriers.

Protection of innovations is always a core issue. If a firm cannot protect its innovations against competitors imitating them soon after launching, it cannot get the surplus that comes from being first mover on the market and which can pay the investments in the innovation development. This problem is particularly crucial to service firms because service innovations are generally simple and incremental and they are very easy to imitate very fast for competitors. This is generally an impediment to innovation in services. The patent system as known from manufacturing plays a very little role in service and seems not to be relevant according to the national reports.

The surveys have investigated which means the service firms finds most important to protect their innovations. Several means are considered as the most important: Trade marks and marketing, the firm's image and market position and concealment of the process and know how. Patents is practically not considered as a means at all. The juridical means that the firms points out are first competition clauses for employees and next intellectual property rights.

4.2.6 Blurring industry boundaries

Service innovations, and in particular use of ICT as a means for innovations, may lead to new structures within the service sector. New industries may appear and old disappear or merge, and boundaries between service industries may be blurred. This is currently happening in the financial services industry as several of the national reports demonstrates. Insurance companies and banks enter each others area, retailing is marketing bank products, alone or in

co-operation with banks etc. The evolution of ICT networks will probably accelerate this development, which may also come to other service industries.

4.2.7 The trend: Towards a more systematised innovation process

The general trend that the national reports demonstrates is that the innovation process in service firms goes from the former unsystematic "quick idea" process towards a more systematic process where the innovation activities are planned or - if not rationally planned - at least are wanted. The aim for innovativeness is often included in the strategy of the firm. Further, innovations becomes increasingly ICT based, which also means that ICT development trajectories in the future may become more determinant of the innovation process.

4.3 The innovation organisation in service firms is naturally more flexible

4.3.1 R&D departments rare within service

Very few service firms have an R&D department. The national reports only refer to a very few firms. The surveys also demonstrate that only very few service firms have an R&D department or any special innovation department at all. This result has been confirmed in earlier case studies and surveys (which has been carried out in Germany). These results are in accordance with the formerly referred result that service innovations rarely are scientifically based.

4.3.2 Many variations of formalised and informal innovation activities

This does not mean that there is no organising and management of the innovation process. The national reports refer a wide variation of forms of organising the innovations activities including several cases where the innovation process is an informal process within the firm.

The reports describe firms with a formalised innovation activity in form of permanent innovation departments although they are not R&D department as we know them from manufacturing. These innovation departments have the task to evaluate and develop new ideas. Also other variations are mentioned, for example that a product line has the task to ensure innovation or innovation is a collective process within professional knowledge service firms. The latter is demonstrated in an example of an international consultancy firm which attempts to systematise the collective innovation process and make it an efficient international, but still collective, process.

The reports stresses the fact that many innovation activities are organised in formalised ad hoc groups, and that currently many firms are organised as task teams instead of functional departments.

The role of informal innovation activities is stressed in the reports. They refer to corporate entrepreneurship as widespread in service firms. Some reports mention that several actors influence the innovations processes, e.g. experts, anonymous contributors among the employees, there could be several chiefs in the innovation process and several chiefs of the product (e.g. the marketing director, production managers etc.). The innovation processes thus can be a complex, and organisational-political process with actors who have different

interests. This might also lead to conflicts that the top management cannot steer, or maybe not even know about. This could on one hand be an obstacle to the evolution of a formalised, systematic way of innovating, but on the other hand it expresses that much creativity which is necessary to service innovations, exist.

The result of the surveys is that the far most usual form of organisation is a flexible, relative informal process with high importance of informal individual effort and formalised project groups across departments. Next comes the marketing department as the innovating unit.

Although the innovation process in many cases is an informal process, it has become more collective, which means that the whole organisation is more geared to participate in it according to a survey referred in the Danish report. The pure individual corporate entrepreneur has become more rare.

4.3.3 Qualifications and professionalisation

Since the innovation process in services is so dependent on the capability and willingness of the employees to act as corporate entrepreneurs, the qualification structure is very important. Service innovations have an intangible nature which means that the innovations - the coming service product or production/delivery organisation - do not exist in physical form before they are launched as realised projects. They exist in the head of the participants in the innovation process. This is why the competence and motivation of the employees are so important. As mentioned some of the survey results point to lack of qualified personnel as a major barrier to innovation. The surveys where this result was not observed (e.g. some earlier German surveys) only tell that there is no lack of qualified personnel, but it is still a crucial factor.

The importance of qualifications is largest in professional service firms, which in particular can be found within knowledge intensive business services. Here is the innovation process a collective professional effort as several of the national reports point to. Also in mass producing service firms do the employees participate in the innovation process, even when the production is technology intensive.

The collective professional innovation process seems to be an ideal since many service firms, including standardised mass producing ones, aim at developing that. This has also another explanation, namely that in many of these industries it is very difficult to hire people at all, and even more difficult to hire and keep employees that have the necessary competencies and motivation for participating in innovation activities. This has in the reports been demonstrated to be the case in for example cleaning, transport and retail. It is a clear impression from the case studies (even though a final macro-sociological proof is not included in the reports that this is caused by the very low prestige of standardised manual service jobs.

There is in the national reports examples of firm schemes to develop the innovation qualifications of the employees, but it seems to be very different in different industries and types of firm and not a result of public training and education policy.

High educated people (academics) have been in focus as the most innovative category. The reports also demonstrates that they are innovative, but also that groups with lower basic education can be very active in the innovation process. It is a matter of obtaining the specific innovative qualifications, which can be learned through on-the-job training. The concept of the learning organisation is extremely important to services.

4.3.4 External actors are involved in the innovation process

The reports mention many examples of service firms involving external actors such as knowledge centres, technology suppliers etc. in the innovation process. Particularly the customers are mentioned as actors that are particularly involved. Customer involvement is evident in services, which are characterised by a very high customer orientation in the service delivery and even in the definition of the services. If the service should solve the customers actual problems, and maybe do that in an individualised way to the single customer, customer involvement in innovation development processes must be crucial. As mentioned many business service firms develop the innovations in cooperation with the customers, particularly within knowledge services. In this case the innovation is as much an innovation to the customer firms as to the service firm.

However, the reports also stress that service firms in general, and in relation to what one would have expected, have involved external actors very little in the innovation process, in particular other service firms (competitors). The explanation is the simple nature of service innovations which makes it very easy to imitate them very fast. Therefore, the service firms attempt to keep new ideas as secrets as long as possible.

The result of surveys is that of external actors only customers, consultants and suppliers of technology play a role as cooperators. It is remarkable - the extreme customer fixation in service taken into consideration - that only about 1/3 of the service firms have formal cooperation with customers.

4.3.5 The management of innovation could be improved in services

A question that the reports are unable to answer, but which they raise, is whether the service firms are sufficiently involving customers in the processes and how efficient the innovation management at all is. The German report quotes a survey which concludes that there to a certain degree is a lack of proper innovation management in German service firms in general.

However, the national reports also tell of a general trend of more management awareness towards the way of organising the innovation activities and a more systematic organisation of the innovation activities within many service firms. An improvement of the management of innovation thus is underway, but the development might be pushed, for example through awareness and improvement supporting programmes launched by the states, trade organisations, or the EU Commission.

4.3.6 The natural flexibility of service firms is an advantage for future improvements of innovation organisation and management

One could conclude about the general trend that, although there still is a lack in proper organisation and management of the innovation process, most service industries are on their way to improve their situation. The service firms, in relation to traditional manufacturing firms, have the advantage that they always have had the modern flexible form of organisation that many recent analyses have been point to as necessary to fulfil modern market needs. It is a consequence of the nature of service production and delivery. Results from a Danish survey on manufacturing innovations which has included some service industries also concludes that these service industries (finance and trade) had the most flexible organisations. However, still some service industries were found to have old fordistic organisations. In this survey, it was the case to post and telecommunication. One could assume that the fast change of the

telecommunication industry will change this very soon, but still some service areas will keep the fordistic organisation for some time.

The natural flexibility should be a good departure for future improvement of the innovation activities in services.

One core issue that the analyses in the national report raise is whether the services in the future will develop towards a higher degree of flexibility and individual customer satisfaction or towards more standardisation or industrialisation. Both tendencies can be observed today. Another core issue that the reports raise is whether, and eventually how, increased use of ICT in the future can fit with a larger degree of professional knowledge in the content of the services.

4.4 Change of driving forces

From the trend analysis we can conclude about a change in the relative importance of the driving forces that was set up in the model in csection 3.

Concerning the external forces have both service professional trajectories and technology trajectories become of greater importance. Systematic logics and push from these trajectories has to a larger degree become the driving forces due to a larger systematisation and organisation of the innovation process. This means that managerial trajectories, that are very general, often fashion waves, and competitors as driving forces have lost importance. The competitors have lost importance as a driving force because the service firms more offensive and independently decide to innovate. The public sector has also been a more important driving force in two roles. The first is that the outsourcing of public services has made the public sector a major service demander. The second is that deregulation has open up new market possibilities in many service industries. The public sector could play a greater role by providing technology and service professional trajectories through research and change agent institutions. This, however seems to function inefficient in all countries, particularly the support to development of service professional trajectories. This inefficiency seems to be due to two facts: the public research institutions (including universities and business schools and government administrations) are not oriented towards the demand and problems of service firms, and the relationship between service firms and the public sector is weak.

The customers are still a major driving force. They are efficiently involved in innovation activities in some service industries, particularly knowledge based business services, but the general impression of the national reports and surveys is that the service firms not involve the customers as much and as efficient as one should have expected from the servuction nature of the services (that they must be produced with the customer involved in the moment of production, cf. Eiglier and Langeard 1987).

The internal driving forces becomes all together more important in relation to the external as the innovation process becomes conscious, offensive and systematised. Innovation/R&D departments have always been the weakest internal driving force. In contrast to what one could have expected, has the more systematised and conscious innovation process not lead to these departments have got a greater importance. Innovations in services are still not developed in laboratories, but in the production and marketing departments, or in cross-departmental teams, close to the daily production and delivery. Both service professional and technology trajectories diffuse into service firms through the total organisation, i.e. all types

of departments or individuals, and not through specialised scientific innovation departments. This may be changed in the future, and a strengthened role of such departments can be found in a few national reports.

The employees and the management/strategy driving forces continue to be of equal importance. Innovation activities in services are still a balance between corporate entrepreneurial initiatives and top-down, strategic determined initiatives.

5. EFFECTS OF THE INNOVATION DEVELOPMENT

The service innovations may either increase productivity (process and organisational innovations), and thereby indirectly in market extension through a fall in prices, or in direct market extension (product and market innovations). Both should create growth in the service firms, employment and the welfare of the citizens through a wider offer of services that can solve their problems. The investigations referred in the national reports conclude that the effects of the service innovations are not massive and immediate. Effects on productivity are for example reported as often modest. Generally, effects only appear in the long run (where it can be difficult to make out whether they are caused by the innovation); this is also often the case to ICT based process innovations. These results are caused by the nature of service innovations, which as mentioned are generally very incremental and only small changes.

One German survey that has investigated the impact of innovations in services conclude that the impacts regarded by the firms as most important were: increased productivity of employees, flexible adjustment to customer needs. A little far down the list came: speed of delivery and reliability (quality) of products. This reflects the large customer orientation and the double market squeeze that the service firms are in: they must increase productivity and quality, which can be difficult at the same time.

6. INTERVENTION OF POLITICAL AUTHORITIES TO IMPROVE THE SERVICE INNOVATION PROCESS

The project group has, on the basis of the results, assessed where the political authorities most efficiently could intervene in the service innovation process or the driving forces.

6.1 The relationship between the public sector and service innovations

The issue of the role of the public sector in the development of service innovations is of interest to political actors such as national governments and the EU Commission. The national reports point to two characteristic changes in the relationship between the private service sector and the public sector: There has been much deregulation which has induced innovations in the private service sector, and the state has gone from being service provider to be service facilitator, as the UK report concludes.

Reports of public programs for supporting service innovations are rare in the national reports. This seem not to be a core topic, or a topic at all, in policy. One could discuss whether the political-administrative system should be more interested in the development of the service sector. This might be worth a consideration for European governments since most or all job growth is created in the private service sector. Not only inferior jobs such as low paid part-

time female jobs are created, but also full time jobs in knowledge as well as manual services. Innovations is a very important means in developing the service industries and increase the numbers of job.

A few supporting programs which might be an inspiration are mentioned in the national reports. The Swedish report describes a technology program that should improve use of IT in the service sector, a re-organisation of the state department for industrial and technical development so its R&D department also focuses on services, and an informal forum for managers in the public sector with the aim to increase the use of IT in the public sector. The Danish report describes a Home Service program launched by the Danish government. The program supports small service firms that provides manual services to households.

6.2 Interventions of political authorities

Many of the implications of the innovation problems and developments in services concerns the firm level and is a matter for the managers. However, the results referred and discussed above lead to some issues that could be object to political provisions. The result of the project group's assessment is summarised below. These issues might be treated politically at European, national and regional level.

6.2.1 Education and training

Management capability

A major impediment to service innovation is a lack of sufficient management capability to induce and carry through innovation processes in the single service firms and a lack of a learning system through which experiences in single firms could be transmitted to other firms so they could learn from them. Such a learning process could be across industry boarders.

A means to improve these capabilities could be to focus on innovation management in business schools. Management of service firms have low priority in business schools and management of innovation in service firms is a non-existing discipline. This could be changed.

Focusing research on service firms' needs

If service firms should base their innovation process on science and research, this should be research which either develop new methods and principles for service development (e.g. the science of insurance, law, cleaning, etc.), including development of ICT and other relevant technology, or science that tells service firms what their potential customers want in the future (e.g. general sociology and economics, forecasting with scenarios for the future life of people and firms). Such sciences do not currently exist, or if they exist, they are not oriented towards the needs of service firms. A re-orientation of public research could be launched.

Training of employees

Employees are deeply involved in the innovation process in service firms. Their competencies are of crucial importance to the success of the innovation processes. These competencies not only includes technical competencies such as cleaning methods or engineering qualifications, but also the abilities to communicate with customers, to be corporate entrepreneurs and cooperate with others in innovation projects. More training courses and education are needed.

6.2.2 Innovation networks

Innovation networks

Existent network programs directed towards innovation procurement should include service firms, not least small and medium sized such ones. The political authorities could also stimulate the establishment of informal networks, which may be cross-industrial which will stimulate the management and organisation of the innovation process.

Public knowledge infrastructure

A general public knowledge infrastructure on innovation in services could be established. This could include establishment of institutions for awareness and advising of innovation in services, publications, WWW pages, TV programs etc.

6.2.3 Generation of innovation capability

Other means to improve the firms' innovation capability could be more directly oriented towards their innovation awareness.

Benchmarking

The political authorities could establish a benchmarking system where best practices of organising and managing innovation activities could be communicated.

The political authorities could also establish networks, awareness campaigns, and other types of knowledge transmission concerning best practices in service firms on innovation activities and learning to learn and accumulate experiences.

Service laboratories

A kind of R&D institutions that could fit with service innovations could be service laboratories, which could be established. They should not be very science based, push-oriented like chemical laboratories, but small test-organisations where groups of employees could test new service ideas on customer groups. They could also be technical laboratories where the function of new service technology, e.g. ICT, could be tested.

6.2.4 Regulations and standards

Deregulation

The heavy regulation of some service areas. e.g. financial services and health care service, is a barrier to innovation. On the other hand can new regulation, e.g. environmental regulation or tax regulation, lead to service innovations because firms or citizens must fulfill new demands.

Standards

Establishment of common standards, e.g. ICT standards or professional standards in advisory services, improves innovations. The standards set forward new demands and the establishment of common standards creates a “play ground” where service firms can develop innovations on a basis that not changes very soon. This will be an incentive for service firms to become more innovative.

Statistical measurement and standards

Establishment of better statistical data, e.g. occupational and firms classification systems, on the service sector will be a core mean in political authorities’ policy for service development. In particular establishment a new system of indicators for service innovations, innovation organisation and the intensity of relations (e.g. between service firms, to customers, to research institutions etc.) could be a useful tool.

6.2.5. ICT

Establishment of user-friendly standard networks

Information and communication technology is a core technology to most services. New service products could be developed and delivered via ICT networks. The condition for this being a success is that one or a few user-friendly standard systems are established because else the customers will not use the network.

Bibliography

- Barcet, A., Bonamy, J., and Mayère, A., *Modernisation et innovation dans les services aux entreprises (modernisation and innovation in business services)*, Report for Commissariat Général du Plan (1987).
- De Bandt, J., Gadrey J. (Eds), *Relations de service, marchés des services*, CNRS Editions, Paris, (1994)
- Djellal, F., *Changement technique et conseil en technologie de l'information*, Editions L'Harmattan, Logique économique, Paris, (1995).
- Dosi, G. Technological Paradigms and Technological Trajectories : A Suggested Interpretation of the Determinants and Directions of Technical Change, *Research Policy*, 11:147-162 (1982).
- Edvardsson, B., Haglund, L. and Mattsson, J. Analysis, planning, improvisation and control in the development of new services, *International Journal of Service Industry Management*, 6(2): 24-35 (1995).
- Eiglier, P. and Langeard, E. *Servuction : le marketing des services*, Mc Graw-Hill, (1987).
- Gadrey J., Gallouj F. and Weinstein O. New modes of innovation : how services benefit industry, *International Journal of Service Industry Management*, volume 6(3): 4-16 (1995).
- Gadrey J., Gallouj F., Lhuillery S., Ribault T., Weinstein O., *La recherche-développement et l'innovation dans les activités de service : le cas du conseil, de l'assurance et des services d'information électronique*, report for the Ministry of Higher Education and Research, December (1993).
- Gadrey, J. and Gallouj, F. The provider-customer interface in business and professional services, *The Service Industries Journal*, vol. 18, n°2, (1998).
- Gallouj F., Les formes de l'innovation dans les services de conseil, *Revue d'Economie Industrielle*, n°57, 3e trimestre (1991).
- Gallouj, C. and Gallouj, F. *L'innovation dans les services (Innovation in services)*, Editions Economica, Paris (1996).
- Gallouj, F. and Weinstein, O. Innovation in services, *Research Policy* 26:537-556 (1997).
- Gallouj, F. *Economie de l'innovation dans les services (Economics of innovation in services)*, Editions L'Harmattan, Logiques économiques, Paris (1994).
- Gallouj, F. Le processus de production de l'innovation dans les services de conseil (the process of innovation in consultancy services), *Revue Française de Gestion* (March, April, May, 1995).
- Gallouj, F. Towards a Neoschumpeterian Theory of innovation in Services, *Science and Public Policy*, 24(6):405-420 (december, 1997).
- Grönroos, C., *Service management and marketing*, Lexington, 1990.
- Gummesson, E. *Quality control in services firms*, Karlstadt, (1991).
- Miles, I., Kastrinos, N., Flanagan, K., Bilderbek, R., den Hertog, P., Huntink, W. and Bouman, M. *Knowledge-Intensive Business Services: Their Role as Users, Carriers and Sources of Innovation*, PREST, University of Manchester, (1994).
- Normann, R. *Service Management*, London (1991)
- Shostack, G.L., How to design a service, in Donnelly, J. and George, W. (eds), *Marketing of services*, Chicago, (1981).
- Sundbo, J. (Management of Innovation in Services, *The Service Industries Journal*, 17(3): 432-55 (1997)
- Sundbo, J. Balancing Empowerment, *Technovation*, 16 8):397-409 (1996)
- Sundbo, J. *Innovation Theory: Three Paradigms*, Cheltenham Glous (1998).

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- Sundbo, J. Modulization of service production and a thesis of convergence between service and manufacturing organizations, *Scandinavian Journal of Management*, 10, (3): 245-266 (1994).
- Sundbo, J. The Tied Entrepreneur, *Creativity and Innovation Management*, 1(3):109-20 (1992)

Appendix

1. The research manual

2. Overview over the content of the national WP3-4 reports

APPENDIX

1. The research manual

The research within work package 3-4 was carried out on the basis of a research manual which listed the topics that should be included in the national reports. The manual includes many topics without the expectation that each topic could be investigated in each country, but it should be possible to find data for most of the topics in at least one country.

It may be useful to summarise that manual in this appendix since it gives some idea of the general goals of the work package 3-4.

1.1 Characterizing innovation types in services

The objective of this first point was, mainly on the basis of a literature survey, to try and define what innovation in services is and how it occurs.

In order to characterize innovation types it was proposed to tackle the following points and questions :

a) Classification of innovation types in services

It was suggested to assess the following typologies :

- Technological innovations, non technological innovations which are independent of technology, non-technological innovations which are dependent on technology.
- Schumpeterian typology : Product, process, organisation, new raw materials or market innovation.

b) Characters of the innovation process within service functions

- How do service innovations occur ?
- How is the innovation process organized ? Is it entrepreneurship (innovation through establishment of new small business), formalized R&D activities or other types of formal innovation department, ad hoc development of maybe stochastic ideas, involvement of many employees in the innovation activities ?
- Can an innovation process in different stages be identified ? How are these stages characterized ? Is it a linear or more complex process ?
- What are the relationships between firm strategy and service innovation (are the innovations determined by the strategy ?) Are there indicators of this (ex training policy, etc.) ?
- what are the relations between an innovating firm and its environment : its surrounding markets and their actors (intermediate and capital goods markets, product markets), its competitors, related business, public agents, etc.

c) The impact on economic performance parameters at the firm level

These parameters could be : employment, skills and work organisation, productivity, tradability, quality of products and services.

1.2 Identifying innovation patterns (trends, trajectories, drivers, effects)

The aim was to investigate whether there exist coherent innovation patterns within service functions. Are the service innovations connected to anything or are they independent events (ad hoc ideas) ? If a coherent pattern exist, how can it be characterized ? Is it a system where driving forces or determinants can be identified ? If so, which are the driving forces ? Can service trajectories be identified (i.e. paradigms of service professional ideas/methods, e.g. of

how to develop and deliver insurance); are innovations determined mostly by service trajectories or technology trajectories ?

In order to identify innovation patterns in the selected service it was suggested to address the following questions :

a) Characteristics and parameters indirectly linked to innovation at industrial/sectoral/national level and for example :

- growth rate of the different sectors
- data on number of service firms creations and closing down
- data on investment and capital stock
- data on productivity (theoretical problems should be discussed in a satellite project)
- data on employment and structure of employment
- data on internationalisation of services

b) Structural sectoral characteristics directly linked to innovation and especially :

- market structure : competitive or monopolistic sectors. As far as possible we will try to define the main institutional suppliers in each given sector.
- role of sectoral professional organisations in innovation and knowledge acquisition and diffusion.
- customers structure and its evolution (as far as certain types of customers are more innovation sensitive than others), evolution of need and demand, evolution of demographic characteristics and innovation.
- the outsourcing issue. Are there service sectors-functions which are more externalised than others (which ones and why) ? How to link this to the innovation issue ?
- environmental (technical, economic, social, institutional) dynamics, learning and innovation.

c) public policy towards innovation in different service sectors

- survey of existing policies towards innovation in services
- public services (free or not) competing market service sectors
- service sectors having local or national public administrations as their main clients
- professional organisation : for example the fusion of the profession of "avocat" and "conseil juridique" within legal consultancy in France.
- shift of best policy practices in the field of innovation from sector to sector and from country to country.
- policy-induced initiatives to enhance inter-firm best innovation practice diffusion.

1.3. Developing indicators of innovation in services

This is a very difficult question of whether we can find indicators of innovation in service activities. The emphasis was put on on methodological issues: Can we find indicators ? Which could it be ? How valid and reliable are they ? How easily can they be measured ?

It was suggested to collect the following data for each selected sector within each country :

- data on R-D and innovation expenses
- patents data
- citation data, bibliometric data for scientific literature on co-authorship involving service firms
- data on collaborations and networks
- data on number of researchers
- entrepreneurial activities : data on new services provided by newly established service firms.

- training/education investment/activities (immaterial investments)
- other types of formal organisation of service innovation activities
- cultural bases for innovation activities (norms in school system; this could correlate with innovation level in manufacturing), etc.

1.4. Assessing and internationally comparing service sectors' links to knowledge infrastructure and other links

First issue is whether there are any relationships between service innovation processes and the knowledge infrastructure in society - and if there are, how strong they are. Second issue is a qualitative assessment where the service innovation pattern/systems is compared with that in manufacturing.

More precisely, following topics were asked to be investigated :

- special links with the knowledge infrastructure. We must ask whether there exist links from service functions to : Research institutions (public/private), universities and education institutions, public/semi-public/private business, innovation and technology procuring institutions (technology agencies, business associations, centres of innovation etc.),
- existence of education and training organisations for special service sectors (tourism schools, SME-oriented consultancy schools)
- sectoral complementarities as a form and source of innovation.
- manufacturing industries as complementary assets for service industries
- personnel mobility and spin-off : distinction between high mobility sectors and others.

1.5. Assessing the potential for and impediments to innovation in services in Europe (seen of a national view, for each country)

Potentials and impediments could be on different levels : international ; within EU ; national ; sectoral ; barriers to cross sectors (e.g. between a service and a manufacturing sector) ; within firms

a) Potentials

The potentials on national to firm level have been investigated in point 1.1-1.4 above. Thus, here the goal is to focus on EU and international potentials. This means :

- does internationalization of service firms improve innovation in services ?
- has EU any re-/de-/regulation functions that have improved innovation in services ?

b) Impediments

The project here was to draw a systematic list of impediments at different levels and to particularly focus on barriers to internationalization of business service firms :

- does each nation or EU have impediments (trade barriers) that EU could remove (only such ones that are relevant to innovation) ?
- if there are national, sectorial or in-firm barriers, could EU (or maybe each nation) remove these barriers ?

c) Political instruments (see also 1.2 c)

Do analysis or political proposals in the countries point out any political instruments that could improve innovation in services. We should particularly emphasize instruments that EU can use.

2. Overview over the national reports

The table in section 3.1 displays which of those topics are dealt with by each involved country (the page numbers in each report where the topic is treated are indicated in the scheme). Each national report is published by the national teams. The name and address of the national teams can be found in section 3.1.

2.1. Involved institutions

The national reports of work package 3-4 have been written by the following institutions:

Denmark	Jon Sundbo <i>Innovation in services. Denmark</i> Roskilde University, Centre of Service Studies (RUC), PO Box 260, DK-4000 Roskilde and Danish Technological Institute (DTI), PO Box 141, DK-2630 Taastrup The national report has been published by Centre of Service Studies, Institute of Geography, Roskilde university, telephone +45 46742400
France	Faïz Gallouj, Faridah Djellal and Camal Gallouj <i>Innovation trajectories in French services industries</i> Institut Fédératif de Recherche sur les Economies Industrielles, Université de Lille I (IFRESI), 2, rue des Cannoniers, F-59800 Lille, telephone +33 320125877
Germany	Brigitte Preissl <i>Service innovation in Germany</i> Deutsches Institut für Wirtschaftsforschung (DIW) Königin-Luise-Strasse 5, D-14195 Berlin, telephone +49 30897890
the Netherlands	Pim den Hertog and Rob Bilderbeek <i>Recent innovation patterns in services in the Netherlands</i> TNO Centre for Technology and Policy Studies PO Box 541, NL-7300 AM Apeldoorn, telephone +31 555421458
Norway	<i>First SI4S report on innovation in Norwegian services: studies of 5 selected service industries</i> STEP group, Storgatan 1, N-0155 Oslo, telephone +47 22477310
Sweden	<i>Innovation in services - National profile report WP3-4</i> Department of Technology Policy Analyses, NUTEK Analys Liljeholmsvägen 32, S-117 86 Stockholm, telephone +46 886819100
the UK	Paul Windrum, Kieron Flanagan and Mark Tomlinson <i>Recent patterns of service innovation in the UK</i> PREST, The University of Manchester, Oxford Road, Manchester M13 9PL, telephone +44 1612755921

2.2 Topics in the national reports

In the table below is an overview of the national reports. The figures in the table refer to the pages in which the topics are treated in each national report.

TOPIC	Denmark	France	Germany	The Netherlands	Norway	Sweden	The UK
General industry development							
Quantitative description	6-8	7-24 42-48 72-73 82-85	5-7	11-16 29-30		5-9	8-34
Qualitative description	8-12	7-24 42-48 68-72 85-87	3-4 74-79	3-10	3-4		4-7 26-34
Investment pattern						10-11	24-25
Outsourcing tendency	9	70 85	8-9				
Sectorial analyses							
Retail/whole-sale	6-8	Appendix report 150 p.	22-23 75-76	13-16 31-34	37-41	5-8 13-14 18-19	11-6 18-21 36-42
Restaurant and hotel	8	Appendix report 50 p.		13-16 34-35		5-8 14-15 19	11-16 18-21
Tourism - general	6						18-21
Financial services	6-8	42-66	22-23 34-41 75-76	15-16 37-42	30-35	5-8 16-17 21-23	11-16 18-21 40-41 59-64
Real estate				15		5-8	11-16 65
Business services	6-8	6-41	20-23 75-76	13-16 42-46	42-51	5-8 16-17 20-21	11-21 66-80
Transport	8	81-96	22-23 75-76	31-34	5-21	5-8 23	11-16 18-21
Communication	8		75-76	35-37	22-29	5-8 17 23-24	11-16 188-21 43-52
Operational business services (cleaning, catering etc.)		67-80		46-48			18-21 70-77

House-hold services	6			13-16			11-16 18-21
Welfare services	6			13-16			11-16 18-21
Other personal services	8					5-8	11-16 18-21
Public administrative services			41-44				
Organisation of innovation							
General development	7-10	34-36 52-64 76-80	7-10 17-20 85-92	1-2 75-80		1-2	84-85 95-97
Management and organizational types	18-23	34-36 52-64 76-80 92-95	20-23 26-28 30-39 5962 82-85	49-68	14-16 26-27 44-46	29-30	98
R&D	19-20	25-29 52-64	53-64		27 45		98 103
Idea sources		29-34 52-64	64-66				
Customer involvement	23-24	29 52-64 74	9		47-48		85-86 92-93 100-2 104-5 110-12
Innovation types	2-3	25-29 49-51 73-80 87-95	21-34				
Use of ICT in innovations	4-6	25-29 49-51 76-80 91	28-29 49-53	68-74 78-79	16-19 33-34		38-40 44-47 62-64 70-74 83-93 103 109
Resources allocated to innovation activities	24	56-57					
Entrepreneurship (firm set up and close down)	3-4	7-23 72				9-10	
Potentials and barriers to innovation							
Potentials	15	29-34 45 74 85				36-37	

Barriers	15-16 25	36-40 64-66	67-74			37-38	103
Links to knowledge structures	14-15	10-11	10-13	7 24-27	13 48-49		26-34 66-69
Protection of innovations	26	40					58 109-10
Indicators for innovations				17-28		31-35	22-25
Strategic core issues	24-25	85	44-49		34-35		42 50-52 57-58 63-64 74-77 90-92 97
Impacts of innovations							
On firm parameters			79-82				96
On economic parameters						29-30	113
Internationalisation	25	43	66-67			11-13	110
Politics	12-13 16	8 11 33	14-15 62-64		49-50	25-28 38	5-6 44-46 58 60-62 71 109 112
Cases (Firm cases described)		24-29 52-64 76-80		49-74	18-19 26-29 49-74		81-105