

Service Innovation in the Nordic Countries: Key Factors for Policy Design

Final Report

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Service Innovation in the Nordic Countries: Key Factors for Policy Design

- **Characterising service innovation**
- **Key themes in service innovation policy in the Nordic countries**
- **Policy recommendations**

Final Report

Drafted by Carter Bloch

With contributions from Elva Aðalsteinsdóttir, Per-Olof Brehmer, Jesper L. Christensen, Ina Drejer, Katja Hydle, Morten Berg Jensen, Jari Kuusisto, Ragnhild Kvålshaugen, and Anker Lund Vinding.

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<p>Abstract: The objective of the ServINNo project is to examine service innovation policy in the Nordic countries and key factors that influence effective policy design. In order to build a solid foundation for the policy analysis, the project has drawn on innovation data and case studies of Nordic service companies. This includes detailed analyses of innovation activities of Nordic service firms using data from the Fourth Community Innovation Survey (CIS4) and other innovation data. Services are highly diverse, making it very difficult to make broad generalizations on the entire sector. To make sense of this diversity, a typology of service activities was developed based on the literature and Nordic case studies. The innovation analyses and service typology are used as tools in this final report to analyse service innovation policies.</p> <p>In examining service innovation, we will look at policies across the following dimensions:</p> <ul style="list-style-type: none"> • Use of broad policy goals to promote service innovation • Policies that promote aspects which are of key importance for service innovation • Policies with an explicit focus on promoting service innovation • Generic policies that are relevant for service firms <p>An important contribution from this project is insights from interviews with policymakers and stakeholders from Norway, Finland, Iceland and Denmark. These interviews provide valuable first hand information and viewpoints that complement data from policy documents and other studies. The actors interviewed capture viewpoints from a variety of institutions, including trade associations, employee organisations, ministerial departments, universities and innovation agencies.</p> <p>The report covers service innovation activities and policies in all five Nordic countries, with the objective of providing a basis both for Nordic benchmarking and for exchange of experiences. Statistics, typologies and interviews are used as tools to aid in service innovation policy analysis. In addition, this report takes a broad view of innovation policy, addressing both direct and horizontal policies that can impact service innovation.</p>		
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Executive Summary

The interest towards service innovation policy has been growing together with the economic significance of services. At the same time service related policies have remained relatively under developed. Increased levels of innovation are central in improving the performance of the service sector and the entire economy.

The objective of the ServINNo project is to examine service innovation policy in the Nordic countries and key factors that impact effective policy design. In order to build a solid foundation for the policy analysis, the project has drawn on innovation data and case studies of Nordic service companies. This includes detailed analyses of innovation activities of Nordic service firms using data from the Fourth Community Innovation Survey (CIS4) and other innovation data. Services are highly diverse, making it very difficult to make broad generalizations on the entire sector. To make sense of this diversity, a typology of service activities was developed based on the literature and Nordic case studies. The innovation analyses and service typology are used as tools in this final report to analyse service innovation policies.

Examining service innovation policy is a complex task. A wide range of policies may support service innovation, which also includes policies that promote a broader, multidimensional concept of innovation, and many policies that are 'generic' or apply to all sectors. However, many generic policies may be biased towards manufacturing in their design or focus. For these reasons, we point to four dimensions of policy that require investigation in order to gain a full view of service innovation policy:

- Use of broad policy goals to promote service innovation
- Policies that promote aspects which are of key importance for service innovation
- Policies with an explicit focus on promoting service innovation
- Generic policies that are relevant for service firms

Effective service innovation policy requires action along all these dimensions. A broad based approach is particularly important for the successful implementation of service innovation policy. An important part of an approach to target service innovation is the reanalysis and adjustment to existing policies, both innovation policies and other policy areas. This is likely only feasible with a broad political mandate.

And, as we have seen above, service innovation is more than technological innovation, and while many firms may engage in technological R&D, it is often not at the core of their innovative activities. Hence, promoting service innovation means taking a broader approach to innovation policy. An explicit focus is also important. This does not mean that policies without a visible focus on service innovation do not benefit service firms. Many existing policies do. However, their impact and likely also their design would be different if these policies explicitly took account of service innovation.

Finally, targeting service innovation does not necessarily mean policies that specifically target the service sector. Many generic or sector neutral policies are relevant for service firms, though explicit focus is needed to ensure effective impact on service innovation.

The box below summarizes the main implications of this report for service innovation policy.

Box 2. Key themes in service innovation policy

Broad based policy approach

- Particularly important for services
- Coordination of policy areas
- Coordination of policymaking institutions

Services as explicit focus area for innovation policy

- Establish mandate for promoting service innovation
- Thinking service innovation into generic policies
- Policies directly targeting services

Adjusting R&D policies to better target service innovation

- Funding criteria
- Broaden focus to include non-technological innovation
- Tax credits

Interaction with public research – greater flexibility

- Flexible forms of cooperative arrangements
- Multidisciplinarity
- Public research as provider of knowledge intensive services

Promoting non-technological innovation

- Client interaction, demand driven innovation
- Promote use of design, creative approaches
- Promote KISA as enabling technologies

Stakeholder involvement in policy design and implementation

- Two-way channel for business support and policy learning
- Engage established firms (in both manufacturing and services) in promoting service innovation policy agenda

Regulations and competition policy

- How and when regulations are implemented impacts service innovation
- Stakeholder involvement important

Improving access to financing

- Financing needs both at start-up and later growth stage

IP management

- Awareness, better enforcement
- Broader focus: promoting IP management (both formal and informal methods)

Demand-side policies

- Potential for service promotion through demand side policies
- Awareness of impact of public procurement on service innovation

Policy Learning

- Evaluate and measure
- Being lead country means experimenting
- Stakeholder involvement
- Interactive forum with policymakers in other countries, researchers

A broad based approach is an essential and challenging element of effective service innovation policy. The countries that have adopted a comprehensive policy that recognizes that innovation is impacted by a broad range of policy areas have gain more widespread support for innovation policy and have been much more effective in implementing coherent policies. Service innovation should be an explicit part of this policy agenda. This provides an important mandate for taking into account the specific needs for service companies and for realizing the often complicated coordination activities needed for service innovation policy implementation. This point is relevant for both service-specific and generic policy measures. While clear evidence can be found for extensive use of some generic policy measures by service firms, overall impacts will likely be greater if service innovation is stated as a clear aim.

Broad-based policies necessitate coordination among both institutions and policy measures. There are a number of potential obstacles here that may complicate this. Hence, this coordination is facilitated if it is made a part of overall innovation strategies, making coordination part of the policy mandate. Coordination can involve both formal (such as interministerial departments) and informal arrangements.

Intricately related to this coordination issue and the effective design of all policies is **the importance of stakeholder involvement.** In order to effectively design service innovation policies, policymakers are dependent on the first hand experience and expertise of businesses and other actors. Stakeholder involvement may have additional positive results, such as garnering support for measures and the active engagement of key companies in their implementation.

Innovation patterns vary across service activities, with important implications for policy. **Expert services** have high knowledge competences and may often conduct technological R&D, though this will often not be at the core of development activities. High customization and client interaction, combined with the fact that much knowledge is embedded in the individual worker, complicates the systematic organization of innovation activities. An important element here is choosing the right projects and the right customers (Skjølsvik et al., 2007). Beyond their role as a direct source of productivity growth, expert services have an important role in the innovation system as a source of new knowledge for other firms. Hence, interactive projects and procurement policies may be helpful tools in promoting and diffusing innovation activity of expert services. **Specialized services** also have a high knowledge component, but may be more standardized in terms of the skills and methods used. Hence, improvements in regulations, standards and platforms can be important facilitators of innovation for these activities. For **client services**, the role of the user is also important, though there may be less focus on innovation. Non-technological forms of innovation, such as user-driven innovation and new business models, are likely to be of greatest important for client services, along with IT applications. **Standard services** are less technical, with a higher share of low-skilled labour. A main focus area here for innovation is introducing a systematic approach to business renewal, and involving all workers in innovation processes.

In order to better target service innovation, R&D policy needs to adjust criteria and programs to better fit service innovation. There are good arguments for doing so: while services R&D may not be able to match manufacturing R&D on technical merits, impacts in terms of productivity and knowledge diffusion may be just as great. In addition, greater flexibility in the forms of industry-science interactions may greatly increase the usefulness for service firms. And, as many service firms may not be accustomed to seeking policy support, efforts to increase awareness of the availability of policies may also be useful.

There is fairly wide acceptance of the importance of non-technological innovation, but less on the role of innovation policy. One approach to **promote non-technological innovation** that has begun to emerge may have broader applications in this area. This

essentially **treats knowledge intensive services as enabling technologies, supporting both their development and promoting use by other firms.** An example here is design services in Denmark.

The blurring boundaries between manufacturing and services have a number of important implications for service innovation policy. First, **service innovation policy is relevant for a broad range of sectors, in many cases representing a broadening or reorientation of innovation policies.** There are for instance examples where service innovation policy is actually directed at manufacturing firms (E.g. Finland and Germany). This importance across sectors also emphasizes the importance of attaching a more visible profile to service innovation. Second, **large established manufacturing companies can play a key role in putting service innovation on the policy agenda.** Third, **blurred boundaries underline the important role of knowledge intensive services as an enabling technology, regardless of whether outsourced or developed in-house.** For example, the productivity gains of technological R&D and goods development (and thus also R&D incentives) may in many cases depend on potential for attaching services to the final product packages.

For many service firms, it is more instructive to consider IP management more generally than just the protection of IPR, as options for IPRs are lesser. While government should work to improve protection of IPRs for services, **IPR policy should have a broader perspective. One implication here is to include IPR support services as part of broader business support functions.**

Linking government guaranteed loans to advisory support seems a promising way to both improve access to funding for service start-ups and increase their chance of success. However, larger high risk capital that may be important for rapid growth is mainly limited to high tech firms, despite the fact that many potential high growth firms may be within services. **There may be large potential gains to government efforts to improve access to (or the quantity of) risk capital for service firms.** This area requires further research and deeper understanding of the specific challenges typical of the service enterprises. For instance, valuation of intangibles is essential and needs to be developed in the services context.

Framework policies will have a significant influence on the service innovation and related policies. Overall, competition policies and regulation bear strong direct and indirect influence on the services innovation. For instance environmental regulation may create significant demand for various types of expert services and innovative solutions. Also the implementation of services directive will affect regulation in member states. Especially the requirements to offer information to also overseas service firms will in practice mean an extra impulse for E-government, smarter and less complex regulation and internationalisation. All this will create further scope for service innovation.

Education policies in the Nordic countries stress the improvement of math and science competences. While there are good reasons for this, policy should not lose sight of the fact that multidisciplinary may be just as vital an element of education and training.

There are a number of examples of demand-side innovation policies in the Nordic countries. Recent studies have pushed to increase this, arguing for the benefits of using government procurement as an innovation tool on a broad scale. Given the size of the public sector and its purchases of goods and services from businesses, procurement policies are likely to have a significant impact on business innovation, both intentionally and unintentionally. It is thus advisable for government to be explicitly aware of how their procurement practices affect competition and innovation in businesses.

Finally, **policy learning is essential for effective policy delivery and can be pursued along a number of channels.** Service innovation policy is a new and complex area, and lack of experience with policy measures may act as a significant barrier to policy

initiatives in this area. Evaluation and testing are both important for policy learning and to garner wider support for promoting service innovation. This includes both new initiatives, but also to a high degree existing measures, where we lack hard evidence on both the use by service firms and impact on performance. In addition, efforts to increase awareness of service innovation and available policy measures also provide an opportunity to learn more about potential barriers to participation in policy programmes. Finally policy experiences in other countries are a very valuable source of information that can be pursued both bilaterally, but also through the establishment of networks of policymakers and researchers within service innovation.

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1. Introduction

Interest towards service innovation policy has been growing together with the economic significance of services. At the same time service related policies have remained relatively under developed. Increased levels of innovation are central in improving the performance of the service sector and the entire economy. However, national innovation policies have paid limited attention to services, and, in general, service-sector firms have not been very active participants in the government-sponsored innovation programmes. There are several key reasons for the current state of service related innovation policies and programmes. First, services represent a highly heterogeneous set of activities. Second, service innovations are multidimensional in nature involving organisational, operational, delivery system, customer interaction and technology related dimensions. Third, there is a need for better understanding of the design and delivery of service innovation related policies and programmes.

The objective of the ServINNo project is to examine service innovation policy in the Nordic countries and key factors that influence effective policy design. In order to build a solid foundation for the policy analysis, the project has drawn on innovation data and case studies of Nordic service companies. This includes detailed analyses of innovation activities of Nordic service firms using data from the Fourth Community Innovation Survey (CIS4)¹ and other innovation data. Services are highly diverse, making it very difficult to make broad generalizations on the entire sector. To make sense of this diversity, a typology of service activities was developed based on the literature and Nordic case studies. The innovation analyses and service typology are used as tools in this final report to analyse service innovation policies.

Examining service innovation policy is a complex task. A wide range of policies may support service innovation, which also includes policies that promote a broader, multidimensional concept of innovation, and many policies that are 'generic' or apply to all sectors. However, many generic policies may be biased towards manufacturing in their design or focus. This makes it necessary to look at a broad range of innovation policies and at the specific details of policy measures in order to assess how well they cater to service firms. In examining service innovation, we will look at policies across the following dimensions:

- Use of broad policy goals to promote service innovation
- Policies that promote aspects which are of key importance for service innovation
- Policies with an explicit focus on promoting service innovation
- Generic policies that are relevant for service firms

An important contribution from this project is insights from interviews with policymakers and stakeholders from Norway, Finland, Iceland and Denmark. These interviews provide valuable first hand information and viewpoints that complement data from policy documents and other studies. The actors interviewed capture viewpoints from a variety of institutions, including trade associations, employee organisations, ministerial departments, universities and innovation agencies.

¹ The data and calculations based on CIS4 data that are used in this report and in Bloch (2007) have been provided through the NIND project (Policy Relevant Nordic Innovation Indicators, also funded by NICE), by the statistical agencies responsible for CIS4 in each of the Nordic countries: Statistics Finland, Statistics Norway, Statistics Sweden, RANNIS in Iceland and CFA in Denmark. Their input to this report is gratefully acknowledged.

This report adds to the knowledge gained from existing studies on service innovation and service innovation policy². There are a number of points worth emphasizing that distinguish this report from earlier work. First is the Nordic perspective. The report covers service innovation activities and policies in all five Nordic countries, with the objective of providing a basis both for Nordic benchmarking and for exchange of experiences. Second, while this project also analyses service innovation activities, its solid focus is on service innovation policy. Statistics, typologies and interviews are used as tools to aid in service innovation policy analysis. Third, this report takes a broad view of innovation policy, addressing both direct and horizontal policies that can impact service innovation.

1.1. An overview of other ServINNo project work

This report is the final publication of the ServINNo project. It contains both contributions from the other publications in the project, and also includes new material. The project consisted of three parts: innovation analysis, a service typology and policy analysis. The main publications of the project are described below³:

The Fourth Community Innovation Survey (2004) contains a broad range of data on innovation processes in manufacturing and service enterprises. It also provides the best option for comparing innovation performance internationally. The report, *Service Innovation in the Nordic countries: An analysis using CIS4 data*, by Carter Bloch, utilizes a variety of innovation data to investigate service innovation across service sectors in the five Nordic countries.

Blurring boundaries between manufacturing and services, by Jesper L. Christensen and Ina Drejer, explores the extent to which the boundaries between manufacturing and services are blurred. Based on Danish data the paper shows that service firms by no means only generate their turnover from service activities, and that a considerable fraction of manufacturing firms also carry out service activities. However, the majority of the firms in both sectors do appear to focus on either manufacturing or services when it comes to development activities.

High performance work practices and innovation in the manufacturing and service sector, by Morten Berg Jensen and Anker Lund Vinding, examines the use of systems of work practices (high powered work practices, HPWP) in services and manufacturing firms and their role in innovation. The analysis draws on Danish data covering both innovation and a range of work practices. The results show that the simultaneous adoption of all work practices is positively related to firm performance in services as well as manufacturing.

Taxonomy for business service innovation, by Ragnhild Kvålshaugen, Katja Hydle and Per-Olof Brehmer, develops a business service innovation taxonomy linking business service types to sources/drivers of innovation. It identifies four competencies in business services firms that potentially can drive innovation; customer competence, organizational competence, market and network competence and ICT competence. In order to align these competencies to business services, they develop a business service typology by arguing that degree of standardization and degree of client interaction in the service delivery process are the major categories for distinguishing business services. Based on

² A selected list is Hauknes (1998), Green et al. (2001), van Ark et al. (2003), De Jong et al. (2003), Howells and Tether (2004), ECON Analyse (2005), Forfás (2006), DAMVAD (2007b), Dialogic et al. (2006) and Kuusisto (2007).

³ Other ServINNo project work includes background papers on innovation policy in Denmark (Bloch and Aagaard, 2007) and Iceland (Aðalsteinsdóttir, 2007) and a literature review of typologies of services and service innovation (Kvålshaugen, Hydle and Bloch, 2008). In addition, policy interviews were conducted by Katja Hydle in Norway, Elva Aðalsteinsdóttir in Iceland, Jari Kuusisto in Finland and Carter Bloch in Denmark.

a combination of these categories, four generic types of business services are identified: expert business services, client business service, special business services, and standard business services. Informed by the service innovation research and case examples from business service firms, they link the four business service types to innovation drivers (competencies types) and suggest a business service innovation taxonomy.

The research report, *Mapping Service Innovation Policies in the Nordic Countries*, by Jari Kuusisto provides a synthesis of the 11 policy mapping studies carried out by the innovation policy project in services (IPPS, a preparatory SSA Inno-Net project) and the Nordic Innovation Centre (NICE) ServINNo project. The general purpose of the document is to analyse and disseminate information on the current state of the service innovation policy. The report has two more specific objectives. First, it seeks to advance the knowledge on innovation policies targeted at service related innovations. Secondly, it seeks to offer up-to date information for the policy makers on the challenges and opportunities related to service innovation policy design and delivery by:

- Identifying and gathering information on the key European actors in the area of service innovation policy
- Analyzing the strategic and policy issues in the service innovation policy context
- Suggesting some options for service innovation policy development in the future

The remainder of this final report is described here. Section 2 of this report discusses the main features of service innovation, and the rationale for policy intervention. For both understanding and policy, it is vital to take account of the multidimensional nature of service innovation and the great heterogeneity of service activities. Section 3 presents a typology of service activities that is designed to make sense of this heterogeneity. Section 4 takes an initial look at innovation in service firms across sectors and Nordic countries, and also key competences for service innovation, based on the typology. Section 5 outlines the broad range of policies and key issues for policy design. Section 6 sheds light on the blurred boundaries between manufacturing and services, drawing on project work.

The remaining sections of the report focus on key themes in service innovation policy:

- The use of broad-based policy approaches
- R&D policy and collaboration
- Promoting non-technological innovation
- Horizontal and framework policies, including regulations, IPRs, entrepreneurship, demand-side and regional policies.

For each theme we discuss key issues, drawing on statistics from within and outside the project and on insights from interviews with policymakers and stakeholders, and illustrated through examples of policy measures in the Nordic countries.

The final section concludes with key policy implications and recommendations based on project work.

2. Characterising service innovation

2.1. *The service innovation policy rationale*⁴

What is the policy rationale for service innovation policies? This is a central issue as it is clear that market or systems failures must be identified to justify policy intervention, and the examination of policy rationales aids in policy design. The following issues have been brought up by the recent literature⁵:

- Service innovation is a stimulant for innovation on a broader scale and for investment in intangibles and knowledge, factors of endogenous growth and total productivity
- There is relatively low productivity and performance in many service sectors and, while use has rapidly increased in recent years, there is still an under use of information and communication technology (ICT) in some services in Europe
- Typically, the relatively low participation of services companies in R&D programmes. This goes directly to the Lisbon strategy and the aim to achieve the 3% of GDP in R&D investments in Europe
- The lack of formulation and organisation of service innovation, which requires the promotion of new instruments of business support
- The recent deregulation and liberalisation in many service sectors, which means that businesses relinquishing their protected market niches need to find new strategies to boost competitive levels
- The current phenomenon of relocating services to lower-cost countries or countries with a higher specialisation forces many businesses in advanced countries to find new competitive strategies based on innovation
- Fragmented markets where many services are offered locally within the national context, and a lesser number of services are offered for common European markets
- A heterogeneous service sector that includes a wide range of different types of industries with different innovation patterns, and
- Public sector services that are increasingly seen as a target for innovation policy.

Reasons for policy intervention to promote service innovation depend on the type of policy and types of innovation activities they seek to promote.

Reasons for policy intervention to promote service innovation depend on the type of policy and types of innovation activities they seek to promote. For example concerning technological R&D, the case is the same as for manufacturing, where it is well established that technological R&D investments are less than socially optimal. Rationales are also straightforward for policy to remove infrastructure and market barriers that hamper service firms' business activities. The main issue concerning the rationales for service innovation policy concerns non-technological innovation activities that are 'closer to the market'. Following den Hertog et al. (2003), the case for intervention depends on two things:

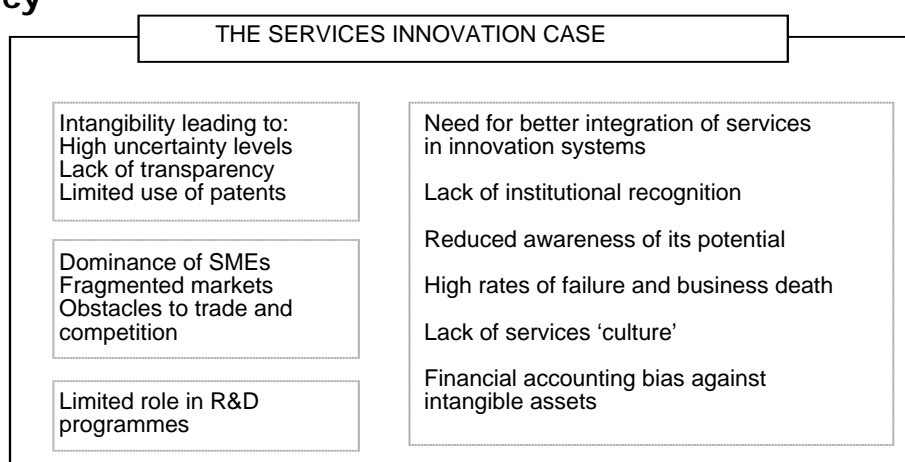
⁴ This subsection draws partly on Kuusisto (2008).

⁵ Rubalcaba (2006).

- Is there great uncertainty and substantial cost involved with developing non-technological innovations?
- Are they difficult to appropriate (i.e. easy to copy), with a negative impact on the level of service innovation activity?

There is good reason to believe that the answer is yes in both cases; i.e. that uncertainty, high costs and potential lack of appropriability lead to underinvestment in a number of non-technological innovation activities that are central to service innovation. Figure 1 brings together arguments for the case of service innovation policy. It shows the key elements that arguably justify service innovation policy⁶.

Figure 1. Arguments for the case of service innovation policy



Source: Adapted from Rubalcaba, 2006

The column on the right highlights some institutional failures that would justify the implementation of service innovation policy. These include: the need for better integration of services into innovation systems, lack of institutional recognition of services, reduced awareness of their potential, high rates of failure and business death, lack of services culture, and inability of financial accounting to recognise the intangible assets.

2.2. The Multidimensional nature of service innovation

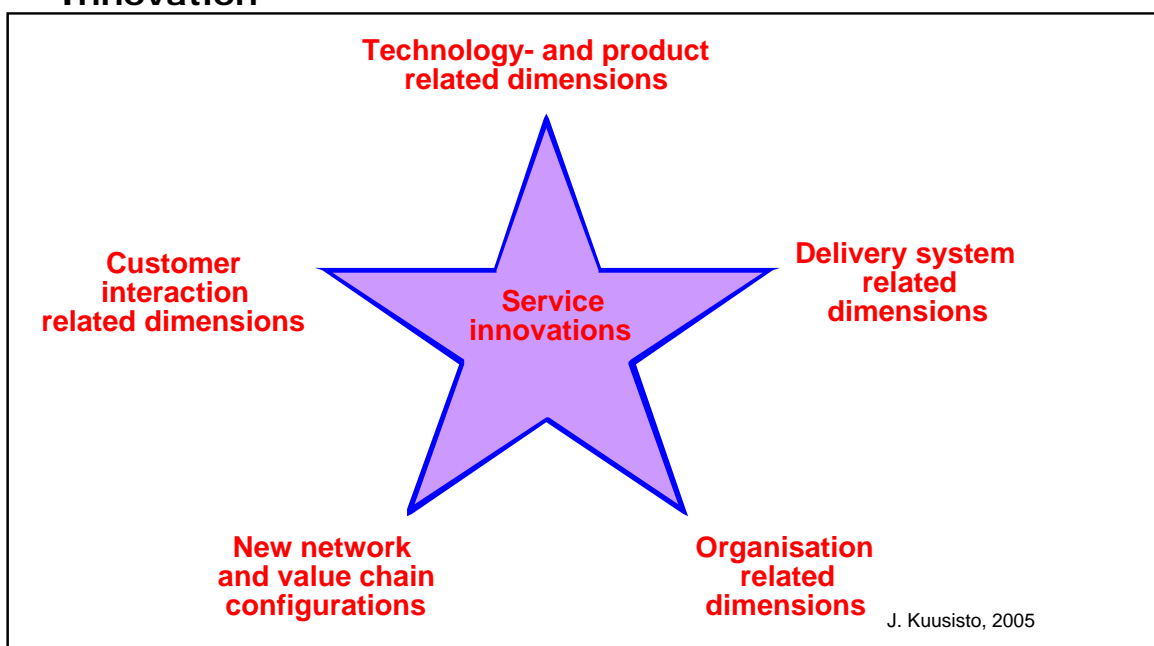
An understanding of the characteristics of service innovation and how service firms innovate form the basis for a discussion of service innovation policies

Service innovation is often very interactive and multidimensional in character, encompassing a wide range of activities, including:

- Technology development and applications of existing technology
- Organisational innovations related to service delivery
- Customer interface and service delivery channels
- Business model and value chain innovations
- New types of service concepts

⁶ Rubalcaba (2006).

Figure 2. The Multidimensional Nature of Service Innovation



New network and value chain configurations can include new types of service offerings, new combinations of existing services or changes in relations with competitors and value chain partners. Interrelations with other firms (both competitors and value chain partners) are important here, as are regulatory frameworks. Customer interaction related dimensions involve changes in customer interfaces, which will often be IT related. Delivery systems related innovations are changes in delivery methods, back office logistics or in how services delivered. Organisational dimensions encompass a wide range of organisational changes, such as changes to structure, management, work practices, and how the business functions and/or organizes innovation activities. Finally, technology based dimensions include product or process innovations that have a clear technological character. Box 1, taken from Forfás (2006) shows some examples of innovations within each of these dimensions.

These dimensions are useful in illustrating the different facets of service innovation, and have been utilized in a number of earlier studies. Throughout the report, we will utilize innovation survey data to shed light on how service firms innovate. And, already from this brief description a number of implications for policy can be seen. Among these are: the importance of regulations, promotion of development and adoption of ICTs, and the importance of a variety of forms of non-technological innovation. Technological innovation is important, but often is not central for service firms' activities (see below). This, however, does not mean that broader forms of R&D are unimportant for service innovation; on the contrary, broadening R&D policies may be an important element of service innovation policy.

For the most part, these dimensions are captured by the data, though they do not all perfectly correspond to the statistical definitions of product, process, marketing and organisational innovations used in innovation surveys (OECD/Eurostat, 2005) and in this report.

Box 1. Examples of the Dimensions of Service Innovation

Dimension of Service Innovation	Examples of Innovative Service Concepts
New network, business model and value chain configurations	<ul style="list-style-type: none"> • Financing, insurance and phone services offered by supermarkets, e.g. Tesco Finance. • Open source software development and distribution.
Delivery systems	<ul style="list-style-type: none"> • ATMs, telephone and internet banking. • Amazon.com internet bookshop that originally offered new electronic customer interface. Now the scale of delivery system and availability of extensive customer profile data facilitate further innovation, e.g. introduction of totally new product categories, such as gardening tools.
Organisational innovation	<ul style="list-style-type: none"> • First Direct's purpose built organisation, office buildings and location facilitating call centre functions of telephone banking. • Turnaround of Yellow Roadway Corporation to customer value driven service provider required fundamental change of the entire organisation.
Customer interfaces	<ul style="list-style-type: none"> • Global tracking of deliveries via purpose built internet site. Followed by introduction of eShipping Tools for automated shipping process, eCommerce Solutions enabling online trading integrated with FedEx shipping capabilities. • eSupply Chain Solutions enabling improvements in global supply chain performance.
Technology and product based innovation	<ul style="list-style-type: none"> • Internet and on-line services. • Mobile phone based tracking. • GPS location identification services, e.g., in the case of a road accident or theft of a car. • Radio frequency identification (RFID), electronic toll collection at toll booths, library book or bookstore tracking, pallet tracking, building access control, airline baggage tracking, and apparel item. • Nanotechnology based developments.

Source: Forfás (2006)

A number of other characteristics of services help shape how service firms innovate and how policy should be designed to promote service innovation. These have been discussed often before, though it is still important to mention them again here and to have them in mind when examining actual policies.

Intangibility. Services are not objects, they are activities. Typically, they can't be stored and customers are unable to see them beforehand. The intangible nature makes service assets hard to value, creating difficulties for obtaining financing. This also complicates the registration of property rights. It also has implications for entering new markets; many service firms will need to physically locate in new markets in order to offer their services.

Simultaneity. For many services, production and consumption are continuous. This may attach an additional element of importance to client interaction, and may give a larger role to the customer as a 'coproducer' of service innovations (eg. Ramirez, 1999; Skjølsvik et al., 2007). It also implies in many cases that new service development will be hard to separate from 'production', with the result that much service innovation will be *incremental* in nature.

Customization. Some though clearly not all services are highly customized to the individual client. As we will discuss below, the degree of standardization is an important dimension in determining how service firms innovate and, correspondingly, how policy can best promote service innovation.

The human factor. While this varies greatly from industry to industry, in general, the human factor will be more important for services, for production, delivery and development. This will tend to place greater emphasis in innovation activities on worker competences and client interaction. And, even for purely technological innovations, their implementation will likely have greater impacts on organisational and work practices in service firms.

2.3. Is innovation in services really that different from manufacturing?

A fundamental question – and one that has been discussed in many earlier studies – is to what extent innovation in services differs from that in manufacturing. The question arises in particular due to the fact that the far majority of innovation theory and measurement has been based on innovation in manufacturing firms. Though, as we argue below, focus should be (and to some extent is) moving towards capturing the diversity of service firms as opposed to the comparison of services and manufacturing.

Three approaches to treating service innovation can be found in the literature: assimilation, demarcation and synthesis. Assimilation reflects an (older) passive view of service firms as technology adopters and not sources of new knowledge and technology. Service firms were essentially examined with the same glasses as for manufacturing firms, and with a predominant focus on technological innovation.

Demarcation instead argues that a distinct approach is needed for services. Technological innovation is only a small part of service firms' innovation activities; the service innovation concept needs to include a variety of forms of non-technological innovation. In particular Drejer (2004) argues however, that non-technological innovation is also important for manufacturing firms, so while a broadening of coverage may be needed, this is the case for both sectors.

A fundamental question – and one that has been discussed in countless studies – is to what extent innovation in services differs from that in manufacturing.

This leads to the synthesis approach: while services and manufacturing firms may differ in how they innovate, we can utilize the same 'toolbox' of concepts and methods to analyse innovation in both sectors.

A more practical issue also argues strongly for the synthesis approach. In practice, we may not be able to separate service and goods innovation even if we wanted to. The line between services and manufacturing is becoming increasingly blurred, with a substantial share of firms selling both goods and services. As Howells (2004) argues, the manufacturing sector is becoming increasingly "servicised", with many traditional manufacturing firms shifting more and more of their business to services. This trend manifests itself in a number of ways, among them: instead of straightforward sale of

The service sector is very heterogeneous, and the more service firms are recognized as innovators, the more important capturing this diversity becomes in order to inform effective policymaking.

goods, using goods to provide a service (examples are leasing cars or airplanes), or services that are attached to goods ("encapsulating services", Howells, 2004).

Primary focus has been on this trend within manufacturing, though the analysis in this project indicates that this trend is also very much present in services (Bloch, 2007; Christensen and Drejer, 2007). We discuss these results in more detail below.

The idea that services should be considered in terms of activities that can be found across sectors is central to the OECD KISA study (OECD, 2006). As opposed to KIBS, Knowledge Intensive Service Activities focus on the activities themselves, which span services, manufacturing and public sectors and are central vehicles for the flow of knowledge within and across sectors.

The implication here is that to a certain extent, the promotion of service innovation should target all sectors, and should take into account the different roles that KISA can play in innovation and knowledge diffusion. Among the policy implications from the KISA study were:

- Supporting greater trade in knowledge intensive services, both on the supply side (knowledge intensive business sectors) and the demand side (external use of KISA by other firms).
- Networking
- Encouraging the development of organisational and management structures, and HR management that builds and utilizes KISA.

2.4. Heterogeneity in Services

A vast number of studies have compared innovation in service and manufacturing sectors, with the aims of showing that service firms are in fact innovative and of investigating whether any differences exist between the two sectors. However, comparing services and manufacturing is not enough to understand service innovation; the service sector is very heterogeneous and we need to examine the diversity of service firms in order to inform effective policymaking.

The more service firms are recognized as innovators, the more important capturing this diversity becomes. This was pointed out by Tether (2005). Old 'one-size-fits-all' theories of service innovation placed all service firms as adopters or supply dominated. This view made it less important to account for heterogeneity. However, the changing understanding of service firms as (a potentially diverse group of) innovators requires a greater look at the variety of services – activities, strategies and innovation processes.

A variety of factors, such as the above, and knowledge bases and technological sources, technological and other opportunities offered, extent and ways that firms can appropriate their innovations, etc., will affect how service firms innovate.

Service firms range from among the most technological to the least advanced...and everything in between; diversity that is arguably far greater than that within the manufacturing sector (Miles, 2005). Personal services typically involve basic skills and technologies, and are organised on a small scale. In hotels, restaurants and catering, the focus is on food preparation and delivery, entertainment and experiences. Tourism has elements of distribution and experiences, and is highly dependent on culture, events and nature. Health, social and education services rely on a mix of high and low level skills and a strong or full presence of the public sector as a provider. Distributive services range from transports and logistics, which rely heavily on physical capital and infrastructure, to retail and wholesale trade to technology intensive telecommunications. Financial, insurance and real estate services are typically large scale firms with a heavy reliance on advanced information technologies. And business services range from manual services such as cleaning and other office and building services to administrative services such as accounting and law, to technical services such as computing and engineering.

A number of dimensions can be used to give a general characterisation of each of these sectors and the differences between them, such as: skills, capital intensity, IT usage, scale, client contact, specialisation, and organisational structure. These will all impact how these different types of service firms innovate. However, it would be a mistake to

consider these characteristics as static for a given firm. Often, innovation will involve large changes in how firms operate, altering their basic business characteristics. Examples could be: a new business model that provides a (small scale) personal service on a large scale; innovations that automate or standardize services that were typically very client intensive (eg. ATMs), or that increase client interaction (eg. adding services to manufacturing goods, or accounting firms that offer broader types of business consulting services).

Evangelista (2006) examines the diversity of innovation across service firms using innovation data. A variety of factors, such as the above, and knowledge bases and technological sources, technological and other opportunities offered, extent and ways that firms can appropriate their innovations, etc., will affect how service firms innovate. Evangelista (2006) finds that variation in innovation activities among service enterprises is substantially greater than for manufacturing enterprises. He finds for example much wider variation across service sectors compared to manufacturing sectors concerning overall innovative performance, the types of innovative activities carried out, and patterns of interaction.

3. Making sense of heterogeneity – A typology of services⁷

As stressed above, the diversity (and ubiquity) of services means that it is not enough to analyse services as one group in comparison with manufacturing. And, the immaterial nature of services implies that services should be considered as activities and not tangible objects. Hence, as also argued in the KISA study and elsewhere, it may often be instructive to examine services in terms of activities instead of firms.

On the other hand, if we are going to understand this diversity and its implications for service innovation policy, a simplifying framework is needed to capture the most central features of service activities. Kvålshaugen, Hydle and Brehmer (2008) develop a typology of service activities, drawing on existing literature both within management and within service innovation. A more detailed discussion of earlier typologies can be found in this paper⁸.

Two dimensions of service activities of central importance for service innovation are the degree of standardization/customization and degree of client interaction.

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Degree of standardization is important because it questions to what extent the service can be codified and delivered independent of specific people and locations (Maister, 1993; Løwendahl, 1997; Hansen et al., 1999). This means that degree of standardization/customization influence the nature of the service concept (packaging), the service delivery system (production/consumption and assessment of quality) and service delivery technologies (people versus ICT systems) (Den Hertog, 2000). Standardization is seen as the methods used to reduce or eliminate custom, one-time

⁷ This section is taken from Kvålshaugen, Hydle and Brehmer (2008).

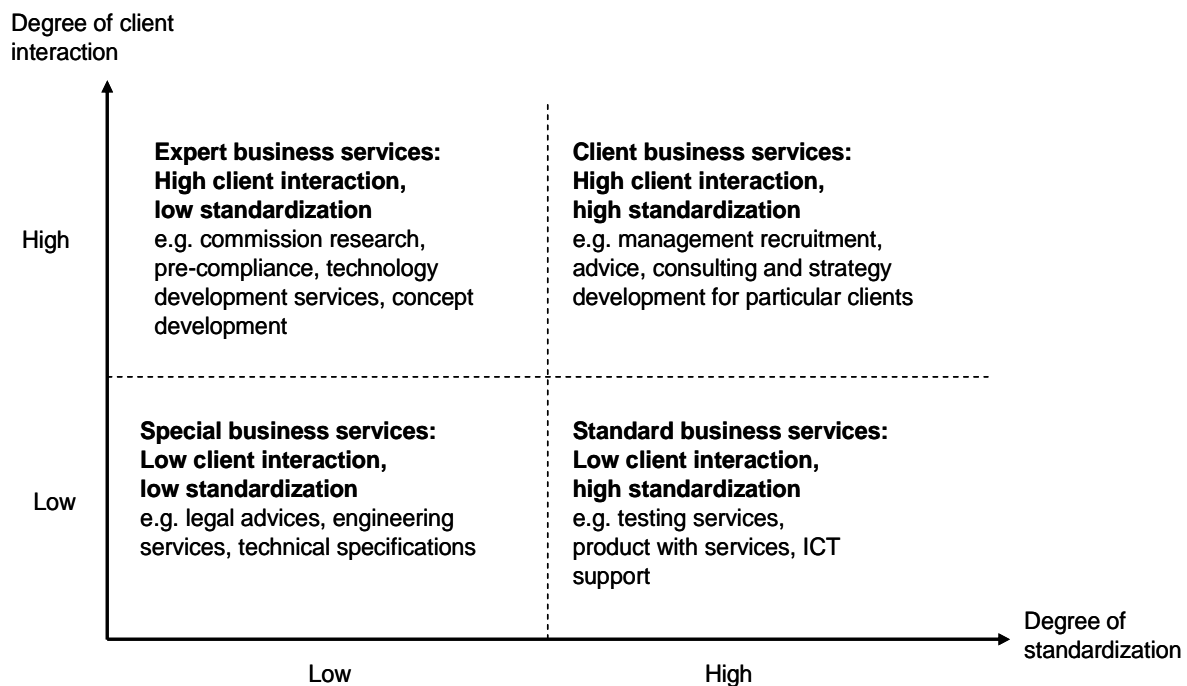
⁸ See also the background paper, Kvålshaugen, Hydle and Bloch (2008), that reviews literature on typologies of services and service innovation.

and seldom-used processes that introduce variability and potential added costs and quality problems. Codification of knowledge relevant for service deliveries in work procedures, databases, templates, documents and ICT systems is often the major mean to standardize services (e.g. Morris & Empson, 1998; Hansen et al., 1999). Customization means that the creation and delivery of the service meets a customer's specific needs. The knowledge used in creating and delivering the service is typically closely tied to the persons who have developed the service, and the consumption process occurs mainly through direct person-to-person contacts (Hansen et al., 1999).

Degree of client interaction is understood as how involved the client/customer is in the service delivery. This is believed to be a major characteristic of services as opposed to products (Normann, 1984). Direct customer contact often means that service provision can be seen as value co-production through provider and client work coordination (co-production) and the process both to create and capture value (transformation) (Ramírez, 1999). Examples of variations caused by degree of client interaction are sequential value creation, sequential value creation with feedback loop (e.g. module based orders – Volvo, measure based orders, tailor made orders), simultaneous presence (e.g. the service is made on/with the customer - hotels; or the customer takes part in the value creation process), and intermediary presence (e.g. telecom services, travel agencies) (Ramírez, 1999).

Using these two dimensions, four prototypes of service activities are identified (Kvålshaugen, Hydle and Brehmer, 2008):

Figure 3. Business Service Taxonomy



Expert business services are typically highly customized, relying on a personalized knowledge management strategy, and created and delivered in close contact with the client. The clients have complex and unique problems (e.g. Larsson & Bowen, 1989; Maister, 1993; Løwendahl, 1997), and these customers are often motivated to actively participate in the service delivery process in order to obtain intrinsic rewards or to monitor the quality of the service. The service is to understand the problem, to find relevant,

Nemko

Nemko provides global market access for products worldwide by applying official standards (e.g. safety). Pre-compliance services consist of advice about product compliance before the product development - when the product is at the drawing desk before the prototype is produced. Any electrical product entering a national or regional market has to comply with the official standards for safety and EMC (electro magnetic compatibility). However, new products might cross several official standards, or the product itself may be so innovative that it is not really covered within existing standards, hence the expert service of pre-compliance. The service involves close customer contact, and the service is tailor-made to the needs of the client and the product involved.

different and new solutions, involving people if/when necessary without following a clear method. The employees (the professionals) of the service provider are usually very skillful and have both explicit and tacit knowledge relevant for the problem area. The knowledge resides in the professional and it is difficult to codify the knowledge because of its specialized and complex nature. There is close interaction with the client throughout the entire service delivery, and learning between

service supplier and clients may be a two way interaction. Examples of such services are commission research, pre-compliance services, technology development services and concept development.

Client business services involve both a high degree of client interaction and a high degree of standardization. In the creation and delivery of these kinds of services, the service provider emphasizes understanding and helping particular client groups, and is highly focused on target client groups rather than professional competences and the scope of services offered (Maister, 1993; Løwendahl, 1997). This means that the knowledge used to deliver the service may be quite standard, but the value added for the client is that the service provider knows the company very well and has strong personal relationships to client personnel. The interaction with the client is mostly at the beginning and at the end of the service process. Examples of client services are management recruitment, advice, consulting and strategy development for particular clients and test by manufacturer services.

Special business services are typically customized, but involve little client interaction in creation and delivery of the service. This means that the problems the service provider solves are likely to be unique and complex. However, the client does not have the time or the competence to participate in the creation and delivery of the service. The type of problems is known, but the specific issue is new and needs customization. Examples of such business services are legal advices, engineering services, technical specifications and research.

BT Industries (BTI)

BTI is a worldwide supplier of warehouse trucks, counterbalanced trucks, manual trucks, and material-handling services. Ideas for new service offerings at BTI are generally created in the dialogue between the customer and the front office, driven with a focus on reaching a high level of standardization in service delivery. The development often has its base in specialized business services that are formalized and offered to other customers. A technical reliability service developed for cold storage operations which through the use of telecommunication monitors and give direct feedback to BTI on failures was developed for a specific customer. The benefits for BTI were significant because the feedback provided an opportunity to refine and develop the service further by the use of a standardized ICT solution installed in every new truck. Thus, creating a service platform on which a similar standardized business service was offered. Thus, most new services are negotiated and co-produced/co-created between BTI and customer.

Standard business services are standardized and involve little client interaction. Such business services are adaptations of ready solutions to client specifications. Much of the content and sequence of the work activities are predetermined. The degree of explication of methods and processes is high. Coordination may nevertheless be substantial due to dependencies between sets of standardized

activities, for example between various forms of project work in construction. The source of competitive advantage lies in the ability to reap margins from mass customization of

high quality services to low cost. These kinds of business services are the ones most alike traditional manufacturing with well known problems and programmatic approaches. Examples of standard business services are testing services, product with services and ICT support.

The aim with the identification of a service taxonomy is to understand how innovation takes place in relation to the different service types, i.e. how organizations renew and create different types of business services. Throughout this report we will utilize this typology (with brief cases as illustrations) as a tool to help identify the different types of challenges service firms may face and how policy can address them.

4. Services and Service innovation – basic statistics

Innovation statistics and indicators will be utilized throughout the report to help illustrate key policy issues. Here we show some basic statistics on the size and innovation activity of various service sectors.

Table 1. Shares of business activity in terms of turnover, 2006.

	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Wholesale trade	Hotels and restaurants	Transport and communication	Financial intermediates	Real estate, rental and business activities	Computer services	R&D services	Business services	Total services*
Denmark	1.8	18.2	3.7	6.1	40.5	1.1	11.3	7.0	10.3	1.7	0.2	5.2	76.2
Finland	*	40.1	3.2	5.9	31.1	1.4	7.5	3.3	7.6	1.5	0.1	3.7	56.8
Sweden	0.5	29.7	3.7	6.2	33.1	1.4	9.0	2.8	13.7	2.7	0.7	5.9	66.1
Norway	23.1	16.9	2.9	5.9	28.2	1.1	8.6	4.9	8.4	1.2	0.2	3.8	57.1
Iceland	0.1	23.8	4.1	9.5	39.3	2.2	10.3	2.0	8.7	1.6	0.3	4.6	72.0

Source: Eurostat Structural Business Statistics for 2006, except:

Turnover for financial intermediates based on CIS4 data for 2004.

Turnover for Iceland: 2005 (Statistics Iceland).

For Norway: turnover for sectors H, I, J, K for 2005 (Statistics Norway Statistics Yearbook 2007).

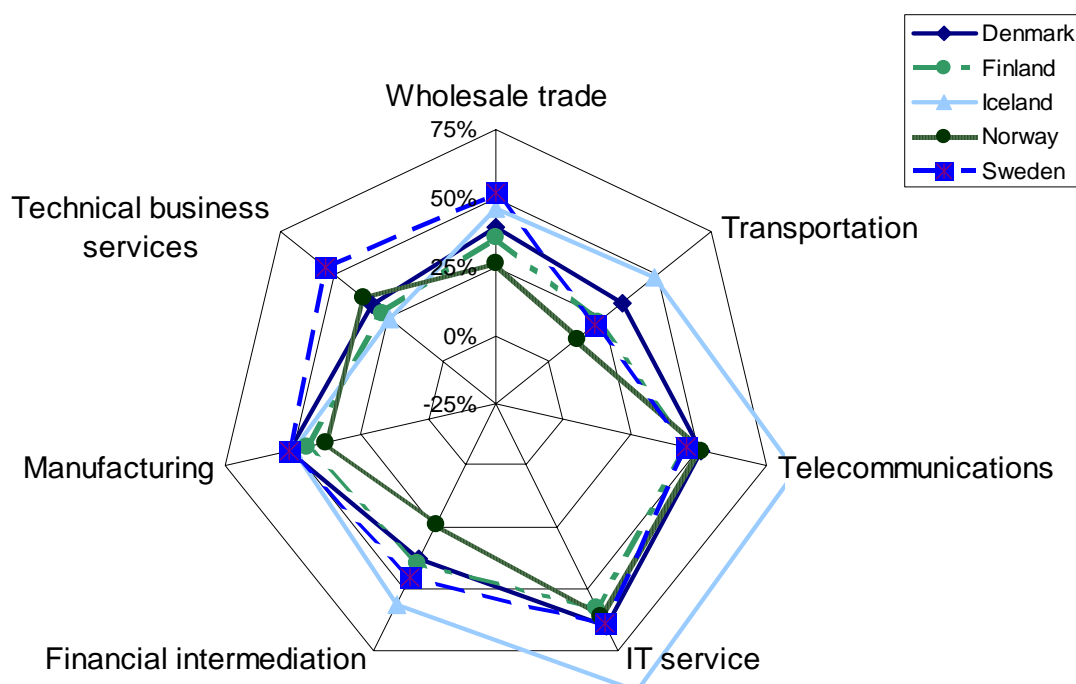
Shares based on total turnover for sectors listed in table (data for Mining not available for Finland).

Total services includes Construction, Wholesale trade, Hotels and Restaurants, Transport and Communication, and Real Estate, Rental and Business Activities. Computer Services, R&D Services, and Other Business Services are included in Real Estate, Rental and Business Activities.

Table 1 shows the relative size of sectors measured in terms of turnover. Denmark has a relatively small manufacturing sector and a high share of turnover, 40 percent, in Retail and Wholesale trade. Also Transportation and Financial intermediates are large in Nordic comparison. The profile for Iceland is very similar to that for Denmark, though Construction is larger and Financial intermediates much smaller. Finland has the largest share within manufacturing among Nordic countries, at around 40 percent. Correspondingly, almost all Finnish service sectors are smaller than in the other Nordic countries. Sweden has the largest share within business services. Norway stands out with over 20 percent of turnover within Mining, reflecting the large oil industry. In terms of shares of turnover, the Norwegian service sector is about the same size as Finland's.

Figure 4 shows shares of enterprises that have implemented a product or process innovation. As noted above, service sectors are highly heterogeneous. Nordic comparisons for the service sector as a whole will thus fail to capture this variation. For this reason, the figure here is displayed across service sectors for each individual country. As can be seen, there is indeed wide variation across sectors and, in a number of cases, results also vary greatly for given service sectors across countries.

Figure 4. Shares of product-process innovative firms by country and service sector, 2002-2004.



Source: National CIS4 data.

The figure indicates a high level of innovation activity among Swedish service enterprises, both compared to manufacturing and compared to results for the other countries. A little under two thirds of enterprises in IT services have implemented a product or process innovation, which is similar to other Nordic

countries, IT service is by far the service sector with the highest level of innovation activity. Innovation performance within Technical business services is substantially higher in Sweden than in other Nordic countries, with over 50 percent of enterprises having introduced a product or process innovation.

Innovation performance in Norway as measured by shares of product-process innovative enterprises, is strong in the ICT sector (IT service and Telecommunications), though much lower in other service sectors such as Wholesale trade, Transport and Financial intermediation. As in the other Nordic countries, innovation performance among Finnish service sectors is strongest in IT services, however, the share of innovative enterprises is much lower in Technical business services. Innovation activity appears to be somewhat more 'balanced' in Denmark: no sector has less than 30 percent innovative enterprises. Surprisingly, the share of innovative enterprises is actually lowest in Technical business services.

For Iceland, the share of product-process innovative enterprises within Telecommunications and IT services is 85 to 90 percent. This is substantially higher than shares in other Nordic countries. Shares are around 50 percent in Wholesale trade, Transport and Financial intermediates, and under 25 percent for Technical business services. Thus, with the exception of Technical business services, shares of innovative enterprises in all other services are either around or higher than manufacturing averages.

4.1. Innovation competences and type of service firms⁹

Drawing on the typology above, which types of innovation are most important will depend on the type of service activities. Kvålshaugen, Hydle and Brehmer (2008) identify 4 competences that shape firms' ability to innovate: (i) renewal based on client demands or insightful understanding of customer problems (customer competence), (ii) development of new delivery channels (based on market and network competence); (iii) organizational abilities to change (organizational competence), as well as; (iv) employment of information and communication technology in order to alter the way that services are managed/delivered/fulfilled (ICT competence). An understanding of which types competences are most important for each type of service activities is important, as policy may in many cases target competences as opposed to actual development activities. The four different types of competence that enable innovation in business services are shown in figure 5.

In long-term business-to-business service relationships there is often demand for application of improved or new technology, new and effective ways to organizing the agreed scope of work, and responding to new knowledge generated while working together. The identification of how technology and knowledge gaps link to customer preferences can provide opportunities for the business service firm to improve services, and thus drive innovation in the organization. Often the

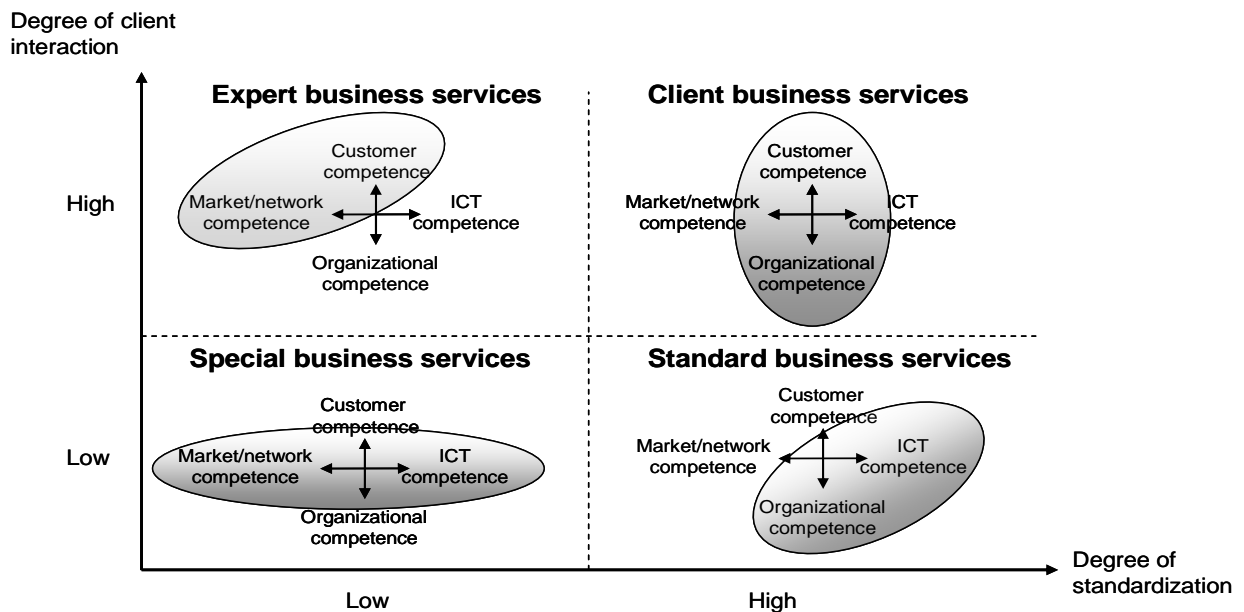
Rambøll Construction

Rambøll Construction provides engineering consulting services over the many phases of building projects, which will typically involve a number of other actors, such as: the client/owner, architects, builders, other suppliers, and the authorities. Consultancy services of Rambøll involve close cooperation with partners and clients throughout a building project and to a much lesser degree specific solutions and calculations. Much of Rambøll Construction's innovation and creation of new knowledge takes place in the course of production processes, where new methods or new solutions are needed to complete project tasks. Much of learning and knowledge creation is thus on an individual level through experience. This presents challenges in spreading new knowledge and competencies throughout the business.

⁹ This subsection draws on Kvålshaugen, Hydle and Brehmer (2008).

customers' service requirements are so complex that in providing a solution to the problem, the service provider needs to develop new knowledge, thus, providing innovation opportunities in business services. Customer competence is important in order to understand how the client interface can be altered and developed.

Figure 5. Innovation competences and the service typology



Innovation through services typically emerge because the service provider personnel act as knowledge brokers in a larger market. The service provider applies the gained knowledge in one industry to achieve a competitive advantage relative to other clients within other industries. To be able to function as a knowledge broker, the service provider has to have access to a wide range of knowledge, including knowledge that resides within client firms and other relevant organizations.

Organizational competencies are used to change organizational structure, HRM policies (recruitment, incentive systems, formal and informal learning requirements), management system, work procedures and ownership structures which can lead to innovations in service delivery systems and service technologies.

The ICT competence concerns knowledge as well as utilization within

Sukker

Sukker is a small consulting and design firm which builds strong and unique brands through graphic, packaging and interior expressions. Sukker has graphic designers, product designers, animators, interior architects copy writers and category, space-management specialists working together. The service of brand completion consists of preparing the technical specifications of a design before production, which entails sound technical knowledge related to production techniques and software. Furthermore, the service is coordination intensive to a network of partners or subcontractors such as architects, furniture makers, packaging manufacturer, printing offices and the like. The service is highly tailor-made. Personal relationships to the subcontractors, the market in general and specific external firms that can be involved in the service process is important in order to be able to deliver the service. Involving the right subcontractors or innovative external firms are thus important for service innovation for brand completion.

firm and services to facilitate or improve inter- and intra organizational coordination of activities, information processing and service delivery. The scope and intensity of ICT is an essential competence through which support the creation and delivery of service as well as service innovations. Such innovations can include introduction or update of tailor-made ICT systems, and new software packages which is to be based on ICT experience and competence, and thus be important for innovation in service technologies.

Implications for policy

The service typology, in particular the two key dimensions of client interaction and standardization, have a number of implications for policy design. First, it is important to keep in mind that many professional services are important channels for knowledge transfer. This thus automatically implies that their innovation activities have a broader impact. And, as is particularly the case for expert services, much innovation takes place over the course of service provision. This has a number of implications for policy. For example, promotion of innovation in knowledge intensive services, and their diffusion, may often be best facilitated through procurement policies, the development of standards or platforms, or cooperative projects to develop new products; i.e. in activities that involve 'learning by doing' innovation. On the other hand, we have seen that innovation activity is low in Technical business services compared to other service sectors. This may be partly due to difficulties in systematically organising innovation activities where much of the development is in terms of individual employee competences.

Second, client interaction is an importance source of innovative ideas, though this interaction varies greatly across service firms. In particular for firms providing standardized services, there is a need to develop approaches to involve employees with customer contact in the innovation process. Employee driven innovation has already received considerable interest in policy discussions, particularly in Denmark; further analysis may better reveal the role policy can play in promoting the spread of best practices developed by leading firms.

The importance of ICT as a driver of innovation is well known, but the typology here highlights the role of ICT as an innovative tool both the dimensions of standardization and client interaction, generally offering solutions to better standardize service offerings while going in both ways concerning client interaction, with solutions that greatly reduce customer contact, and other solutions that are very interactive.

5. Service innovation policy – the need for a holistic policy approach

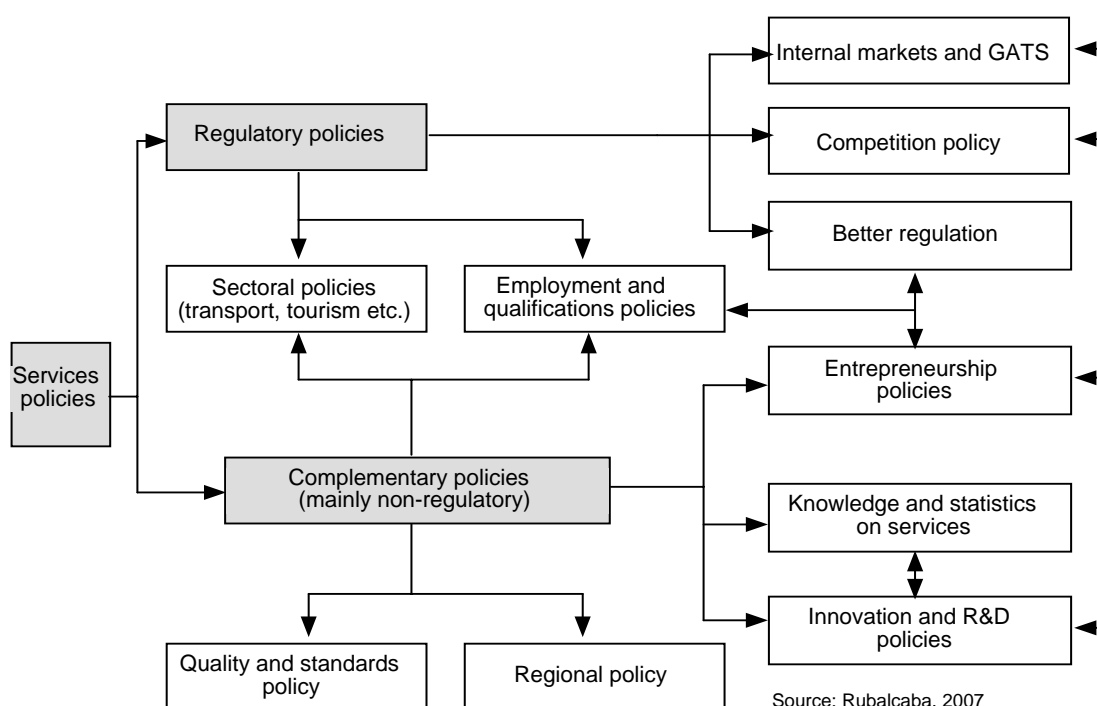
A number of recent studies have stressed the importance of taking a broader perspective in considering how public policy can promote innovation (European Commission, 2002, 2006b). The multidimensional nature of service innovation and implicit manufacturing bias of many policy areas arguably makes a broader approach even more important for service innovation. Effectively addressing broad issues or societal challenges, such as globalization and coping with demographic changes require broad, coordinated policy efforts (Rubalcaba, 2007; Forfas, 2008). In turn, these broad

Broad societal challenges provide an excellent opportunity to give service innovation a central role on the policy agenda, as a key element of overall policy strategies.

societal challenges provide an excellent opportunity to give service innovation a central role on the policy agenda, as a key element of overall policy strategies. We will come back to this in detail later on in the report.

The figure below maps the broad range of policy areas that impact service innovation, including both direct policies to promote services R&D and innovation, policies to promote cooperation and networking and policies to improve framework conditions for service businesses.

Figure 6. Direct and horizontal policies affecting service innovation



There are several policy areas that influence various aspects of service innovation. R&D policies have traditionally focused on science and technological development and the technological dimension of service innovation is in most cases well addressed. However, there is also a growing awareness of the potential role of R&D policies to promote non-technological forms of innovation. Delivery systems related innovation is strongly linked to policies that address networks and infrastructure. In particular, digital delivery that acts as a driver of service innovation. However, also policies addressing road, air, rail and sea transports can be highly important for service innovation, naturally depending on the industry. Competition policy again can secure competition in the delivery system context which is of key importance for many services from broadcasting to retailing.

Each different type of policy has its specific motivations, goals and objectives to fulfil. However, often these policies also have an impact on innovation, and multi-dimensional service innovation in particular. In many cases such unintended impacts have not been taken into account. On the other hand, these 'surrounding' policies are often

comprehensively over looked as potential tools for promoting service innovation. A broad based policy approach has an important role in developing awareness of the importance of the overall policy framework for service innovation, its potential as well as existing barriers. Essentially, this is the main idea behind the so-called 'third generation' innovation policy¹⁰. Central policy areas where the role of service innovation is often not 'thought in' include:

- Regulations, both their design and planning but importantly also how/when they are actually implemented
- Procurement policy
- Administrative and tax rules
- Environmental policy

Broad horizontal policy approaches pose a number of challenges for the actual design and implementation of policy strategies, among them coordination of policymaking institutions and policy areas, and involving stakeholders in the policy process. Horizontal coordination is of vital importance to capitalize on potential synergies across policies areas, to ensure that overall policies are coherent and importantly, also to make sure that different policies do not work against each other. And, as we have mentioned briefly above and will touch on repeatedly below, the actual design of service innovation policies and reducing manufacturing biases cannot be effectively done without the expertise and insight of service firms themselves and their representative organizations.

6. Blurring boundaries between services and manufacturing¹¹

It is becoming increasingly difficult to consider manufacturing and services as two distinct sectors. Many manufacturing enterprises are active in service development, some to the extent of transforming their business towards a complete focus on services. Service innovation is thus a phenomenon that should be analyzed across all industries in the economy. However, we know little about the blurring boundaries between manufacturing and services, and how manufacturing enterprises organize their service development activities.

Christensen and Drejer (2007) draw on recent Danish survey data to examine the blurring boundaries between manufacturing and services. The data¹² contains a number of unique characteristics that allow them to examine closely the extent to which the boundaries between manufacturing and services are blurred.

As noted above, a trend can be witnessed towards increasing encapsulation or packaging of goods and services together to exploit synergies and existing client relationships. A potentially opposing trend is outsourcing. Many firms are increasing their focus on core activities. An example is greater reliance of external suppliers for many knowledge intensive service activities. This trend would generally lead towards greater specialization of activities.

10 European Commission (2002).

11 This section draws on Christensen and Drejer (2007) and Bloch (2007).

12 Their analysis is based on data from three recent Danish innovation surveys: manufacturing firms (2004), knowledge intensive service firms (2005) and a regional survey of business conditions. See Christensen and Drejer (2007) for more details.

Table 2. The Share of activities listed as Services. By industries and size groups.

	No service	1% - 49%	50%-99%	100%	Don't know
Agriculture, fisheries, raw materials	46	20	15	18	
Industry	41	35	14	10	1
Building and Construction	7	18	30	41	4
Trade and restaurants	7	10	17	65	1
Transport and telecommunications	1		5	94	
Finance, business services	3	6	16	72	2
below 10 empl	11	10	19	58	2
10-19 empl	13	17	19	49	2
20 - 49 empl	18	23	14	46	
50-100 empl	31	22	11	33	2
101 – 199 empl	38	26	9	24	3
TOTAL	15	15	17	51	2

Source: Christensen and Drejer (2007).

As part of this project, Danish firms were asked to give the share of activities listed as services and manufacturing, respectively¹³. Results are displayed in table 2 and 3. Table 2 shows that half of the firms in the survey are classified as pure services; two thirds (68%) have listed that the majority of their activity are services. Even 18% of firms in Agroindustries, fisheries, raw materials, and 10% of firms classified as Industry, characterise all of their activities as services. Thus, a large share of firms, 33%, 24% and 71% in Agroindustries, fisheries, raw materials, Industry, and Building and construction respectively, claim that more than half of their activities are services rather than

Table 3. The Share of activities listed as manufacturing. By industries and size groups.

	No service	1% - 49%	50%-99%	100%	Don't know
Agriculture, fisheries, raw materials	18	7	29	46	
Industry	11	8	40	41	1
Building and Construction	46	19	24	7	4
Trade and restaurants	67	11	14	6	1
Transport and telecommunications	96	3		1	
Finance, business services	73	8	14	3	2
Below 10 empl	59	11	17	10	2
10-19 empl	53	10	23	12	2
20 - 49 empl	47	9	25	18	
50-100 empl	32	8	26	31	2
101 – 199 empl	24	6	29	38	3
TOTAL	53	11	21	14	2

Source: Christensen and Drejer (2007).

¹³ Extra questions were added to a regional survey of business conditions. See Christensen and Drejer (2007).

manufacturing. The propensity to list the activities as pure services decreases with firm size, which may not be surprising as many large firms are multi-product firms covering either different, complementary products or more than one link in the value chain. The larger share of service activities in large firms may also reflect that these firms are often more complex organisations.

From both the manufacturing and service innovation surveys, we can obtain information on the relation between service or good innovation and whether they are part of a broader product package. Table 4 reveals that although firms in the manufacturing survey that are assigned NACE-codes for both manufacturing and services are more likely to have introduced new services as part of their product packages than firms with manufacturing NACE-codes only, the differences are not as outspoken as one might have expected: 33% of the firms with both service and manufacturing NACE-codes have developed new services, whereas 22% of the firms with manufacturing NACE-codes only have done so. Firms identified as manufacturing may thus develop and supply services without this necessarily being reflected in the industry codes. This illustrates that industry codes are not always very precise indicators of the actual activities going on in the firms. This as was also strongly reflected in the findings reported in Tables 2 and 3.

Table 4. Relation between manufacturing firms having assigned NACE-codes for both manufacturing and services, and development of one or more new services to be delivered as part of the product package

	Percentage of product innovative firms that have developed one or more new services to be delivered as part of the product package	N
Only manufacturing-related NACE-codes	22%	368
Both service- and manufacturing-related NACE-codes	33%	202
Total	26%	570

Source: Christensen and Drejer (2007).
Differences are statistically significant.

Table 5 shows that 37% of the knowledge intensive service firms that had developed new services had also developed services that were delivered as part of a product package that included physical, tangible products. The product package combining services and physical products was most often supplied by the innovating service firm itself, but in more than one out of four cases the product package was supplied by another firm. The knowledge intensive service firms appear to be slightly more often involved in combining services with physical products, than manufacturing firms are involved in combining their physical products with services: 26% of manufacturing firms have developed services, opposed to the 37% of the service firms involved in product packages that include physical products¹⁴.

¹⁴ There is however a difference in the way that the questions are posed to the firms in the two main sectors: the manufacturing firms were asked whether they had developed new services, whereas the service firms were only asked whether their newly developed services were delivered in a product package that included a physical product – the service firms did not necessarily develop the physical product themselves.

Table 5. Percentage of service-innovative knowledge intensive service firms that – within the last two years – have developed one or more new services to be delivered as part of a product package including physical products

	Package including physical products supplied by firm itself	Package including physical products supplied by another firm	N
Finance and insurance	10%	6%	89
IT-services	46%	13%	155
Other business services	22%	10%	321
10-19 employees	23%	12%	238
20-49 employees	30%	9%	186
50-99 employees	25%	6%	48
100-199 employees	27%	12%	33
200+ employees	28%	8%	40
Total	27%	10%	565

Source: Christensen and Drejer (2007).

Only the differences between industries in percentage of firms having developed services delivered as part of packages including physical products supplied by the firm itself are statistically significant.

A feature of the CIS4 survey is that it separates product innovations into goods innovations and service innovations. This allows us to identify service innovating enterprises across industrial classes in both the manufacturing and service sectors. Furthermore, we are able to identify those enterprises that are active in both good and service innovation.

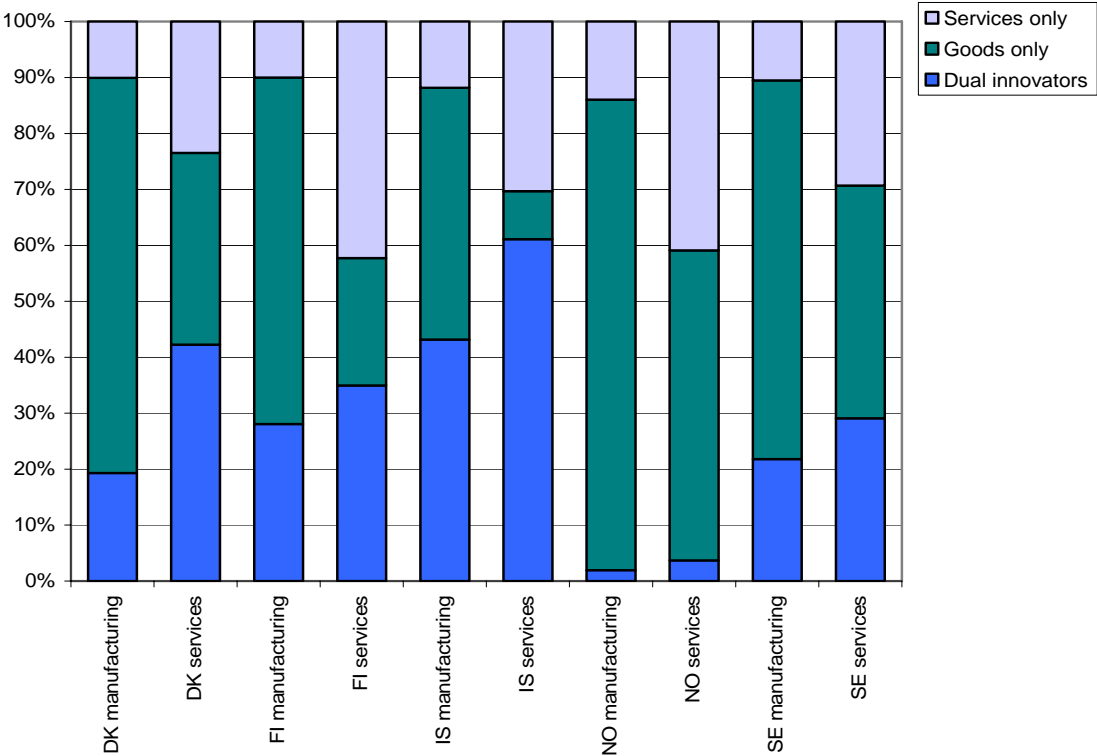
Dual innovators refer to enterprises that have implemented both a good and service innovation. As figure 7 shows, the share of product innovators that have implemented both good and service innovations is higher within the service sector than manufacturing for all Nordic countries. For Denmark the share of dual innovators in services is twice as high as for manufacturing, while the difference is somewhat smaller for the other countries. Note also that in all countries around 10 percent of product innovators in manufacturing have only implemented service innovations. This may for some enterprises reflect an 'incorrect' industrial classification (ie. these enterprises should actually be classified as service enterprises), but may also indicate manufacturing businesses that produce both goods and services, but have placed focus on service development.

Correspondingly, the share of goods innovators in services is also high, and for Norway, Sweden and Denmark, the share of goods innovators in services actually exceeds the share of service innovators.

Blurred boundaries and policy implications. The blurring boundaries between manufacturing and services have a number of important implications for service innovation policy. First, service innovation policy is relevant for a broad range of sectors, in many cases representing a broadening or reorientation of innovation policies. There are for instance examples where service innovation policy is actually directed at manufacturing firms (E.g. Finland and Germany). This importance across sectors also emphasizes the importance of attaching a more visible profile to service innovation. Second, large established manufacturing companies can play a key role in putting service

innovation on the policy agenda. Third, blurred boundaries underline the important role of knowledge intensive services as an enabling technology, regardless of whether outsourced or developed in-house. For example, the overall productivity impacts of technological R&D and goods development (and thus also R&D incentives) may in many cases depend on potential for attaching services to the final product packages.

Figure 7. Shares of product innovators by type of product innovator within services and manufacturing, CIS, Nordic countries. In percent.



Source: Own calculations, CIS4 data. Based on Eurostat Core industries, 10 employees or greater.

7. Themes in service innovation policy

In the rest of this report we will examine service innovation policies in the Nordic countries, focusing on key themes affecting service innovation. The analysis of service innovation policies builds on a number of sources, both within and outside of this project. In particular, we draw on recent work from the EU IPPS and CREST projects, and a recent study of horizontal service innovation policies commissioned by Forfás in Ireland (Forfás, 2008). This work also allows us to draw on examples from non-Nordic countries.

Examining service innovation policy is a complex task. As is discussed above, a wide range of policies may support service innovation, which also includes policies that promote a broader, multidimensional concept of innovation, and many policies that are 'generic' or apply to all sectors. However, many generic policies may be biased towards manufacturing in their design or focus. This makes it necessary to look at a broad range of innovation policies and at the specific details of policy measures in order to assess how well they cater to service firms. In examining service innovation, we will look at policies across the following dimensions:

- Use of broad policy goals to promote service innovation
- Policies that promote aspects which are of key importance for service innovation
- Policies with an explicit focus on promoting service innovation
- Generic policies that are relevant for service firms

Effective service innovation policy requires action along all these dimensions. A broad based approach is particularly important for the successful implementation of service innovation policy. An important part of an approach to target service innovation is the re-analysis and adjustment to existing policies, both innovation policies and other policy areas. This is likely only feasible with a broad political mandate.

And, as discussed in more detail below, service innovation is more than technological innovation, and while many firms may engage in technological R&D, it is often not at the core of their innovative activities. Hence, promoting service innovation means taking a broader approach to innovation policy.

An explicit focus is also important. This does not mean that some policies without a visible focus on service innovation do not benefit service firms. Many existing policies do. However, their impact and likely also their design would be different if these policies explicitly took account of service innovation. Finally, targeting service innovation does not necessarily mean policies that specifically target the service sector. Many generic or sector neutral policies are relevant for service firms, though explicit focus is needed to ensure effective impact on service innovation.

7.1. Interviews with policy actors in the Nordic countries

An important contribution from the ServINNo project is insights from interviews with policymakers and stakeholders from Norway, Finland, Iceland and Denmark. These interviews provide valuable first hand information and viewpoints that complement data from policy documents and other studies. The actors interviewed capture viewpoints from a variety of institutions, including trade associations, employee organisations, ministerial

departments, universities and innovation agencies. This section summarizes main insights from the interviews in each country, pointing at status and key issues in each individual country.

7.2. Denmark

The identification of service innovation in the strategy plan Innovation Denmark 2007-2010 as a key policy area in the near future provided a background for the interviews¹⁵, which were clearly focused on what the next steps should be in the policy development process.

Development of new service innovation policies should start by closely examining existing policies. There is general agreement that service innovation has been neglected in Danish policy. However, neglect mainly reflects the lack of explicit emphasis¹⁶. Many policies may (to differing degrees) benefit service firms despite this. There is a need to recognize and understand this – i.e. to what extent do current policies benefit service firms – as this provides the best available starting point for developing more comprehensive and purposeful service innovation policies.

Innovation policy needs to take into account how service firms innovate. Even if use of policy measures by service firms can be documented, it may often be the case that the design of measures are implicitly 'biased' against service firms. This point was emphasized in the interviews through a number of concrete examples. First, service R&D is generally non-technological, while Danish R&D programs have arguably increased their focus on advanced technologies within ICT, bio- and nanotechnology. While R&D programs do not necessarily need to target the service sector, broadening the focus of R&D programs may open them up to more service firms. Second, service firms typically have a short term horizon for their innovation activities, implying that long term research projects may not fit well. An example given here is the Danish Business PhD program where firms are required to commit to taking on PhD students for half of their study (ie. 1½ out of 3 years). This commitment may be too long for some service firms that might otherwise be interested in taking on a PhD student for a shorter period.

In terms of policy, the most important challenge of internationalisation involves looking inwards. Removing market barriers and accessing international knowledge are both important for maintaining international competitiveness. However, the general impression from the interviews was that the highest priority for policy was to improve framework conditions; strengthening knowledge competences through education and training, and reforming regulations and other framework conditions to keep the Danish business environment attractive and competitive.

Both innovation and other policy areas should take into account the potential for promoting service innovation. An example here is regulations and the implementation of EU directives. How and when these directives are implemented can have important impacts on service innovation. An overly restrictive implementation may handicap Danish businesses. On the other hand, being first to implement new regulations or closely following lead countries can have important advantages for product development. And in order to achieve effective implementation, close dialogue and coordination with individual sectors and businesses is essential.

A vital element of service innovation policy development is a better understanding of how service businesses innovate and the impacts of policy measures. While interviewees

¹⁵ Interviews conducted by Carter Bloch for Denmark.

¹⁶ Service innovation has been 'on the radar' for quite some time, as is for example evidenced by the study of services commissioned in 2000, see Danish Ministry of Economic and Business Affairs (2000).

pointed out a number of areas where innovation policy can better target service firms, it was also stressed that we don't know enough about service innovation and service innovation policy. Hence, the development process of service innovation policies should also include both continued analysis of service innovation (including better statistical data) and careful evaluation of existing and new policy measures.

7.3. Finland

In Finland¹⁷, the interviewees point out that there are two main ways how service innovation policy development changes the situation. First, it means developing existing policies so that they are able to promote service innovation more effectively. Secondly, service innovation policy represents a fundamentally new approach to innovation promotion. Service innovation promotion is seen as a great opportunity to renew innovation policy from a clean sheet, with new measures.

New policy frameworks and institutional structures that are supporting service innovation policy development. The introduction of demand-driven innovation policy is one of the key themes in the new innovation strategy and it is reflected in the new structure of the Ministry of Employment and the Economy which has a specific unit for demand-side innovation policy. High-level management support continues to be instrumental for service innovation policy development. At present services' importance is reflected in the Government programme document, in the innovation strategy that is under development, and also in the vision, strategy, and new organisation of Tekes. The agency now has a service business area, a unit for services innovation and technology programme for services. In addition to the above-mentioned there are some other practical steps that have been taken to give a more prominent position to the promotion of non-technological innovation.

New instruments and tools that have been specifically designed for services innovation promotion. Partly the new focus on service innovation policy is a result from the new state aid rules that enable support services R&D and innovation. For instance, SMEs can now receive funding for purchasing a wide range of consulting services, which can boost demand for KIBS. One of the newly launched instruments is SERVE Technology programme for promoting service innovation. In addition there are a number of other tools and instruments, including manuals for service concept development, services IP management and services productivity. These have made R&D in services more concrete, recognisable and they are creating a common language in this area. One of the challenges is related to the number of new and existing support measures. The more instruments there are, the more difficult it is for target businesses to cope with them, which raises the importance of systems competence (businesses' ability to make use of public supports) among the firms in addition to market related innovativeness.

Framework conditions, service markets promotion and horizontal policy approach as elements of more effective service innovation policy. Service markets are still characterised by legacy type regulation that is hampering service innovation. There is a need to ask what is the actual role of political decision-making and regulation in these areas. The most important horizontal policy areas for service innovation promotion include: education, competition, and public procurement policies, and also the opening up of service markets is important. Overall several ministries have a significant impact on services including Ministries of: Social Affairs and Health, Transport and Communications, Finance, Education, as well as Employment and the Economy. Besides cooperation between the Ministries, there is a need for more effective horizontal policy cooperation between Tekes and the Academy of Finland. Out of the policy areas, social affairs and healthcare ought to be more closely connected with service innovation policy.

¹⁷ Interviews conducted by Jari Kuusisto for Finland.

Challenges in developing supports for non-technological innovation. There is a weak innovation and R&D culture in services leading into lack of business activity in the area of services development. There is a need for a new mindset and full use of the new state aid rules needs to be made. They allow many types of support for service innovation. It remains to be seen how Tekes will adapt its role in the light of new state-aid regulations.

Although service businesses and service development projects are now eligible for R&D supports, the inherent technology bias of these policy measures is still limiting their use among service businesses. One of the limitations is related to the prevailing R&D definition which ought to be more sensitive to the different forms of R&D in services. At present, the definition covers only a fraction of activities that are relevant for R&D in services.

Taxation is high in Finland and it can be hampering the demand for services. Consequently, there is room for tax incentives as a way to promote service innovation.

7.4. Iceland

The policy focus in Iceland¹⁸ has shifted from the technology development towards innovation supports, and services are among the targeted activities. While there is a clear need to support innovation in the public sector, the scope for policy intervention in the market services is perceived to be more limited. 'We constantly deal with this tenacious question, 'what role should the government play?' It is mainly the market failures that are seen as the rationale for any policy intervention.

According to an Icelandic interviewee, 'The core of the matter is to understand the nature of services and what supports services?' There are still very limited offerings of education that is targeting service management or research on services. Overall, there is a need for increased emphasis on non-technological innovation and demand-side policies. The Icelandic interviews build a picture which indicates that service innovation policy is at the early stage of the life-cycle. Typical issues in such a situation include: establishing a common language and concepts, discussion on the rationale of service innovation policy, lack of experience in using the policy tools and a need to develop greater awareness of the importance of services and related innovation.

The innovation policymaking process in Iceland is going through a period of changes. Overall, the policy process is combining elements of top-down and bottom-up approaches. The Science and technology policy council sets the high level agenda and at the same time there are continuous efforts to increase cooperation between businesses and research establishments. There is an emphasis on the effortless public access to the results of the publicly funded research and the system seeks to encourage business R&D. The existing innovation promotion measures and programmes in Iceland are horizontal in nature meaning that they may include and cover both the manufacturing sector and the services sector.¹⁹ Like in many other countries however, there is a tendency to give priority to tangible technical innovation. However, policy actors are starting to pay increasing attention to services development and innovation. In terms of demand side policies, Regional Growth Agreements represent systemic measures that can also support services development. These measures are public-private initiatives where businesses, municipalities, research- and educational institutions cooperate and commit themselves for providing funding or expertise for the project.²⁰

¹⁸ Interviews conducted by Elva Aðalsteinsdóttir for Iceland.

¹⁹ Aðalsteinsdóttir (2007).

²⁰ Examples of more detailed targets for the growth agreements: (i) Enhance the area as a popular place to live, (ii), encourage population increase, (iii) raise area competitiveness and nurture economic growth, (iv) develop and strengthen the area's growth sectors, (v) increase the number of

In terms of future developments, the Minister of Industry and Commerce started to prepare a new bill on Innovation Centres in the beginning of 2007. This entails the founding of an Icelandic Innovation Centre in the north of Iceland. As a result, the public support system for innovation and economic development will be dramatically changed. Institutions (for example, Ice Tec) will be integrated into one and so-called Knowledge Centres will be situated in every region. They are intended to integrate the universities in the areas, the research institutes, businesses and seed/innovative companies to create a synergy that should enhance regional economic development.

Icelandic policy actors have also identified various issues that need to be considered when new innovation policies are formulated. Some of the themes that have been highlighted include:

- The definition of innovation needs to be reformulated so that it includes all of the factors that matter to innovation in service firms, also non-technological dimensions of innovation.
- Financial resources need to be secured for the development of service innovation policies. Some actors have suggested that a fund should be created that is independent from the Technology Development Fund.
- Firms in the field of commerce and service need to be engaged in the whole process of developing policies, some firms will have to be targeted and informed specifically about what is taking place.
- The service sector needs to be researched and evaluated in light of its capabilities to innovate and its innovative strengths.
- Start-up (seed) companies need to be aided financially and assisted in their networking and management processes.

7.5. Norway

Taking the current status of innovation policy in Norway into account, the interviewees²¹ saw in particular two main challenges for developing service innovation policy in Norway: establishing a more visible profile for innovation policy and identifying how policy can better target service firms.

Service innovation policy, and innovation policy in general, needs to be better defined. There have previously been discussions in Norway of implementing a broad based innovation policy, a holistic innovation policy²², which takes account of how innovation and other policy areas can be coordinated to effectively promote innovation. Due in part to a change in government, this plan has not yet been implemented, and interviewees emphasized the need both for a greater understanding of how policy impacts innovation and a more visible statement of policy goals for promoting innovation. This holds both for innovation in general though it is even more the case for service innovation.

Information barriers are the first that need to be overcome in service innovation policy development. Thereafter, focus should be placed on improving existing measures. It was readily acknowledged that there may exist 'biases' in many innovation policy measures that reduce their use by service firms, and Norway also has experience in moving from service specific R&D programs (e.g. PULS) to broader generic policies. However, it was emphasized that the first step really needs to be information and communication, in both

competitive companies and jobs, augmenting the supply of products and services, (vi) exploit the possibilities created by joining in international projects, and (vii) attract international investment and knowledge.

²¹ Interviews conducted by Katja Hydle for Norway.

²² As for example was reflected in the white paper, "From Idea to Value – the Government's Plan for a Comprehensive Innovation Policy (Fra ide´ til Verdi – Regjeringens plan for en helhetlig innovasjonspolitik)" (Norwegian Ministry of Industry and Trade, 2003).

directions (ie. to and from service businesses). Policymakers simply do not know enough about the needs of service firms, and at the same time, the strong impression is that there is not nearly enough awareness among service firms on innovation and on what types of policies measures are offered.

Non-technological innovation is important for competitiveness. An area that was highlighted for future service innovation policy was non-technological innovation. There is a greater need for support of organisational and other 'softer' factors of innovation, as these will have an increasing role in defining competitive advantages.

Concerns over the loss of key national businesses can potentially have a negative impact on internationalisation. Interviewees argued for a greater focus on globalisation, in particular on strengthening the competences that service firms will need to compete globally. A potential consequence of globalisation and openness is that key national businesses may move abroad or into foreign ownership. This concern over the loss of key national businesses has been fairly strong in Norway, and could slow overall efforts to increase internationalisation.

8. Using broad based policy approaches to promote service innovation

Policies to promote innovation will to a certain extent be in competition with other key areas for funding and attention. Efforts to place greater priority on innovation in general and service innovation in particular range from policy statements to white papers and other government documents to the establishment of advisory committees and councils.

8.1. Mobilising high level and broad support for service innovation policy

Recent trends show in general that countries that have succeeded in placing service innovation in the centre of innovation policy have used very broad policy rationales based on socio-economic development that are critical for the national economy and society as a whole. These rationales address not only the importance of service innovation promotion but much broader issues that need urgent attention, thus creating a very powerful policy driver. Here innovation policy is seen as a tool that can renew the economy as well as the wider society to better meet the challenges created by inevitable socio-economic trends.

Service innovation is a multi-faceted phenomenon and without a clear vision it is not easy to communicate all the relevant facts. The importance of including service innovation as part of a broader urgent agenda is based on the way they are able to communicate rationales, objectives and preferences,

A number of countries, among them Finland, the Netherlands and Denmark, have established high profile councils or advisory boards to develop overall innovation policy strategies. These councils, which are headed by the Prime Minister, play an important role both in terms of the promotion and implementation of innovation policies.

and as such create a legitimate basis for priorities that may be difficult to argue or justify²³.

A number of European countries, among them Finland, the Netherlands and Denmark, have established high profile councils or advisory boards to develop overall innovation policy strategies. These councils, which are headed by the Prime Minister, play an important role both in terms of the promotion and implementation of innovation policies. They place innovation policy at the centre of the political agenda, and the involvement of the Prime Minister and other key officials demonstrates a political will to implement stated objectives. The councils also increase awareness and a sense of urgency to innovation challenges. An additional vehicle for policy statements is government white papers that either seek to show the importance of service innovation policies, or outline concrete action plans. While innovation policy councils are important to draw support and implement policy strategies, they are also important for coordination. Without a holistic innovation policy strategy, the coordination of innovation policy becomes fragmented and potentially incoherent. A vision and a broader nationally urgent issue can give direction and momentum for horizontal policy implementation.

8.2. Successful horizontal policy requires effective governance

Horizontal policies bring to the forefront a number of challenges for policy management:

- Improvement of the coordination of government policies across government departments and agencies
- Improvement of the coordination of different levels of government
- Bringing government and stakeholders together in policy development, through deliberation and policy implementation

In a number of ways, these tasks go against the standard ways in which policymaking institutions are organized. The traditional understanding of public administration puts a

A clearly articulated strategic framework of goals and specific, results-oriented benchmarks is essential for keeping governments and the key partners focused on achieving the desired results.

premium on the creation of expertise within a series of departments or agencies that divide the task of governing into specialized functions that reflect particular professional disciplines. In the traditional silo model, management and accountability functions are arranged vertically within departments. There is little room in this model for inter-agency collaboration in defining service sector specific problems and making policies to address them, let alone for the involvement of stakeholders in policy design and delivery. If

successful, though, horizontal policy processes can provide public managers with access to increased resources through the pooling of budgets, improve their understanding of the multi-dimensional nature of service innovation, increase trust between agencies by identifying common interests and the need for ongoing cooperation.

In this context at least the following issues needs to be addressed:

A clearly articulated strategic framework of goals and specific, result-oriented benchmarks is essential for keeping governments and the key partners focused on achieving the desired results. Significant tensions that can exist between disparate cultures, priorities and constituencies show that traditional governance structures are under pressure. In addition, interaction between policies may create inefficiencies related to mutual impacts, lack of leadership, unclear responsibilities, as well as directly

²³ OECD (2005).

conflicting policy objectives. To change a bureaucratic culture, leadership, horizontal policy development and support for horizontal policy-making, must come from the government's political masters and central agencies.

Implementing a horizontal approach and maintaining effective policy delivery simultaneously. It is a very complex task coordinating policy areas and institutions in order to achieve the effective and successful implementation of broad based policies. Institutional changes and new structures may be needed, e.g. agencies, councils, committees, totally new coordination mechanisms both formal and informal. On the other hand, it needs to be recognized that much of the expertise needed to design horizontal policies may lie at lower levels of individual policymaking institutions. Coordination management structures need to be able to incorporate this expertise.

Integrating learning in governance practices. To achieve horizontal as well as vertical coherence, governments need to ensure the availability of strongly supportive knowledge. This points to managing coordination processes to promote learning throughout the system. In general, governments should also create a solid basis for evaluation and learning and make them part of the policy-making process.

Stakeholders' engagement is an essential component of horizontal policy-making. First, even the most conscientious government official will have a limited and imperfect understanding of problems, so stakeholder engagement can fill in gaps in officials' understanding of a problem and make the policy responses better. Secondly, public and stakeholder engagement in policy-making should make the policy outcomes more legitimate and strengthen the commitment of stakeholders to making policy implementation a success, by creating a shared vision and sense of purpose. Thirdly, stakeholder engagement can generate a level of commitment among the public that makes it difficult to either undermine a horizontal policy initiative from within the bureaucracy or repudiate it with a change of administration.²⁴

8.3. Examples of explicit focus on services in innovation policies

A broad range of generic policies, or even selected policies that target manufacturing sectors, may be relevant for some service firms. However, an important implication of the discussion above is that there is a great value in explicitly considering the role of policies in promoting service innovation, both with respect to sector specific and generic innovation policies. This section examines briefly the focus on service innovation in the Nordic countries and also provides some examples from other countries.

Finland is possibly the country that has devoted greatest attention to service innovation policies. The funding agency Tekes has implemented a number of technology programmes that explicitly target services, the main ones being Finnwell (healthcare), Serve (innovative services in B2B services), Tourism and Leisure Services, and VAMOS (value added mobile services) (Kuusisto, 2008). Finland has also recently introduced a broad based innovation strategy to further develop the Finnish innovation environment. Services is one of 11 key themes around which policy measures will be developed (Peltonen, 2008; Forfás, 2008).

Service innovation has received some attention in Norwegian policy for a number of years. **Norway** was one of the first countries to introduce specific programmes targeting service innovation (PULS and TYIN). The PULS programme focused on R&D in the four thematic areas of logistics and transport services; new types of retail, commerce and new

²⁴ Peach (2004).

business models; knowledge based services and flexible working modes as well as ICT-based services such as internet and mobile services. These programmes have since been replaced by generic innovation programmes and Norway has instead initiated a process to examine how service innovation should be promoted in the future. A study of service innovation was commissioned in 2005 (ECON Analyse, 2005), though no concrete measures have been developed following this report. However, service innovation will be among the key themes in the government's upcoming White paper on Innovation for 2008. Norway has also recently launched a policy package to promote innovation in the tourism and travel industry (Norwegian Ministry of Trade and Industry, 2007).

Until recently, little explicit focus on services was present in actual innovation policies in **Denmark**. This also includes the broad based strategy and measures introduced by the high profile Globalisation Council in 2005. However, service innovation has recently been included as a key area in the Council for Technology and Innovation (RTI)'s strategy plan, Innovation Denmark 2007-2010²⁵. The Danish Agency for Science, Technology and Innovation has initiated a comprehensive work process, including a study of service innovation (DAMVAD, 2007b), a conference on service innovation, and the involvement of key stakeholders. Denmark has also launched a program to promote the design services industry (Danish Government, 2007).

Much of innovation policy in **Sweden** is developed and implemented on the regional level, where a number of service sectors are targeted either directly or indirectly. The main focus area on a national level has been through a programme by Vinnova on Services and IT implementation, which includes a number of programs to promote the implementation of IT solution in service activities. Among these are: E-Services in Public Administration, IT in Home Healthcare, and ICT Implementation.

While the importance of service innovation has been recognized in **Iceland**, there has been relatively little explicit focus on it in innovation policies, where the primary focus has been on technological R&D. A partial exception here is within business support services. IMPRA Innovation Centre, established in 2003, provides support services to entrepreneurs and SME's, as well as initiating and supporting regional development agencies and local business advisers. A central goal is to coordinate national actions and initiate cooperation between support agencies. The Step Ahead project is intended to facilitate leaders of small firms (micro and spin-off) in seeking guidance on marketing, finance, environmental product management and organisational matters in order to increase profitability of companies.

Other countries where service innovation has received attention in policy are Germany, Japan, the UK and Ireland. Germany has a fairly long history of programmes to support technology development in services. A new research programme has been launched in 2006, 'Innovation in Services', with three main focus areas: Innovation management for services; innovation in growth sectors of the German economy; and human resource management in service companies. Japan has recently launched a broad based strategy that gives service innovation high priority, with the goal of making services the 'twin engine' of the economy along with manufacturing. Service innovation has attracted substantial attention in policy circles in the UK and Ireland, where both countries have initiated studies and are examining possibilities for better promotion of service innovation (DTI, 2007; Forfás, 2006).

²⁵ The innovation strategy within services has recently been updated in 2008, based on analyses and ongoing dialogue with key stakeholders. See Danish Agency for Science, Technology and Innovation (2008).

9. R&D policies – do they address the needs of service firms?

Despite a continuous broadening of the scope of innovation policies, R&D policies remain the key instrument for promoting innovation. Hence, a central question is what is the role of R&D in services and to what extent do R&D policies address the needs of service firms? Focus here has been on our ability to adequately measure services R&D and on characterising R&D activities in service firms, both of which are important for service innovation policy formation.

9.1. *Are we able to measure R&D in service firms?*

A number of studies have questioned whether current definitions of R&D are appropriate to capture services R&D (Gallagher et al., 2005; Kuusisto, 2007). In connection with this, it is for example pointed out that R&D measurement frameworks were originally designed to measure R&D in technological manufacturing firms and not services. The NSF study points out the importance of actual wording used in questionnaires²⁶, referring to the specific wording used in the US R&D questionnaire. In examining the OECD Frascati Manual, the definition of R&D in principle would seem to also encompass R&D in service firms:

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.(OECD, 2002, p. 30)

In essence, the two main criteria are that activities should be 'systematic' and 'create new knowledge'²⁷. Hence, in principle the overall definition of R&D would seem also to encompass development activities in services. Though, much work can be done in expanding and clarifying guidelines for what types of innovations in service firms should be considered as R&D (as is also acknowledged in the Frascati Manual).

Beyond definitions, there are a number of difficulties for service firms in calculating their R&D, which may result in substantial underestimation of services R&D. The RENESER project (Dialogic et al., 2006), which examines the role of R&D for services, identifies a number of factors that may lead to underestimation of R&D by many service firms. First, most service R&D activities are less formalised in terms of documentation of development processes. Second, much R&D may be 'hidden' in activities that service businesses do not consider as R&D, such as business development, service improvement, and client specific solutions. Third, a larger share of services R&D may lie on the borderline between R&D and 'other innovation', complicating identification and measurement (Miles et al., 2006).

R&D activities may also vary greatly across different types of service firms or activities. *Expert services* are often research or technology oriented, though an important part of knowledge creation will be in the form of new competences. In addition, much development activities may be in close cooperation with clients. R&D activities in *Special*

²⁶ For example that development may also involve the use of research to improve processes and not solely to transform into new products.

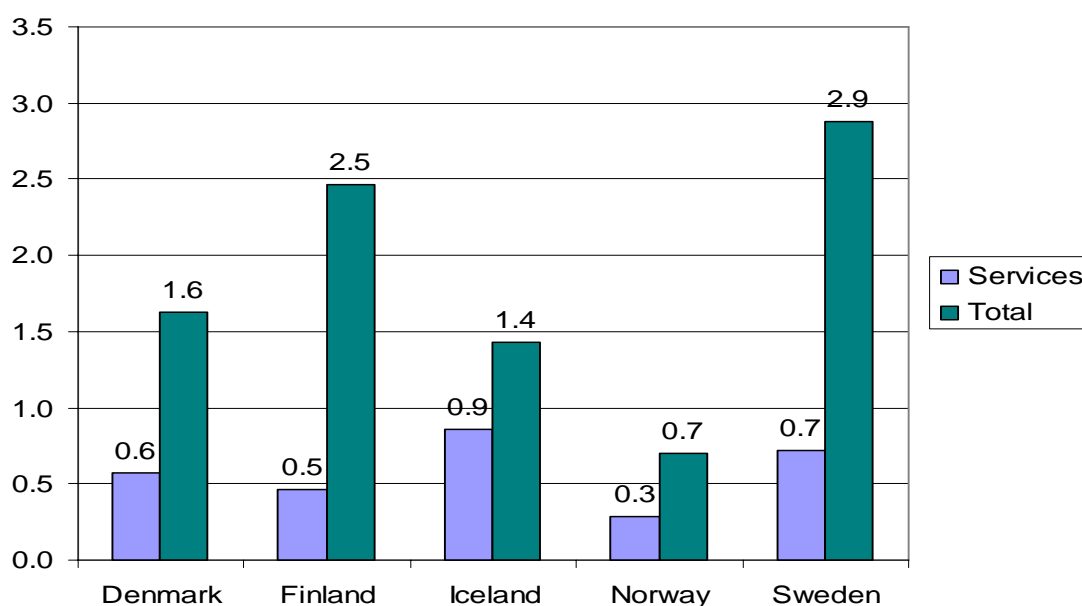
²⁷ An additional issue is the scope of R&D surveys, in particular whether they include softer forms, such as socioeconomic or humanities R&D. These are for example, excluded from the US survey, while they are included in the Frascati definition.

services have some similarities to expert services, though with less client interaction, meaning that development activities are potentially easier to separate from service provision (“production”). *Client services* tend to focus more on process and business model innovations, and the incorporation of new technologies. They are less research oriented, though may have potential novelty in new uses of existing knowledge and technologies. For *Standard services*, development tends to focus on new business models and IT implementation.

9.2. A statistical overview of R&D in services

The R&D statistics in figure 8 and table 6, both from the NICE funded NIND project (Nilsson and Pettersson, 2008), show R&D intensities for services and selected manufacturing sectors. R&D intensity for the service sector (in percent GDP) ranges from 0.9 percent in Iceland to 0.3 percent in Norway. Services R&D comprises 60 percent of total R&D in Iceland, 35 to 40 percent in Norway and Denmark, and around 20-25 percent for Sweden and Finland.

Figure 8. R&D expenditure as share GDP, 2005, in percent.



Source: Nilsson and Pettersson (2008).

Table 6 shows R&D intensities (in percent turnover) for selected manufacturing and service sectors. While Norway has the lowest R&D intensity for the service sector as a whole, R&D intensity is relatively high within IT services and Other business services. And while Sweden has a very high R&D intensity within ICT manufacturing (Electrical and optical equipment), it has the lowest R&D intensity in IT services. R&D intensities for Transport and Wholesale trade are very low in all countries, while intensities are somewhat higher in Financial intermediates.

Table 6 R&D intensity in the Nordic countries in different industries 2005, percent of turnover.

Industries	Denmark	Finland	Iceland	Norway	Sweden
Food products	0.8	0.7	0.2	0.4	0.4
Pulp & paper	0.1	0.7	0.1	1	0.9
Chemical (excl pharm.)	3.2	1.1	3.3	2.9	2.3
Pharmaceuticals	15.6	12.7	41.8	5.2	19.5
Rubber & plastics	1.8	1.1	0.6	1.6	0.7
Machinery	2.9	2.3	1.5	3.5	3.6
Electrical and optical equipment	5.6	6.1	3	7	8.4
Motor vehicles/other transport equipment	0.5	1.7	0.7	1	5.5
Wholesale trade	0.1	0.1	0.2	0.2	0.2
Transport	0	0	0.3	0.1	0.1
IT services	3.1	3.2	3.8	3.6	2.3
Financial intermediation	0.5	N.A.	1.4	0.3	0.3
R&D service	227.3	47	1	44.1	34.4
Other business services	1	1	0.9	3.8	0.5

Source: Nilsson and Pettersson (2008).

Table 7 shows shares of enterprises that engage in intramural R&D, across Nordic countries and service sectors. The table shows fairly wide variation in shares across countries and sectors. Shares are generally highest within IT services, followed by Telecommunications and Technical Business Services, and lowest in Wholesale trade and Transports. Financial intermediation varies across countries, with very low shares of firms with R&D in Denmark and Norway, shares around average in Finland and Sweden and a high 50 percent of firms with R&D in Iceland. The overall share of service firms with R&D is lowest in Denmark and highest in Norway. Hence, this table gives a somewhat different picture than figure 8 above, suggesting that R&D within services is relatively concentrated among a small share of firms while R&D is more dispersed in Norway.

Table 7. Shares of enterprises with intramural R&D, CIS4, Nordic countries.

Sector	Denmark	Finland	Iceland	Norway	Sweden
Wholesale	7%	19%	7%	11%	25%
Transport	8%	11%	29%	7%	12%
Telecommunications	28%	27%	57%	45%	27%
Financial intermediate	12%	22%	50%	8%	24%
IT services	39%	61%	83%	58%	59%
Technical Business Services	24%	28%	NA	39%	43%
Services total	13%	23%	30%	33%	27%
Manufacturing total	27%	38%	32%	33%	41%

Source: Own calculations, CIS4 data. Based on Eurostat Core industries, 10 employees or greater. NA: Data on Technical business services not available for Iceland.

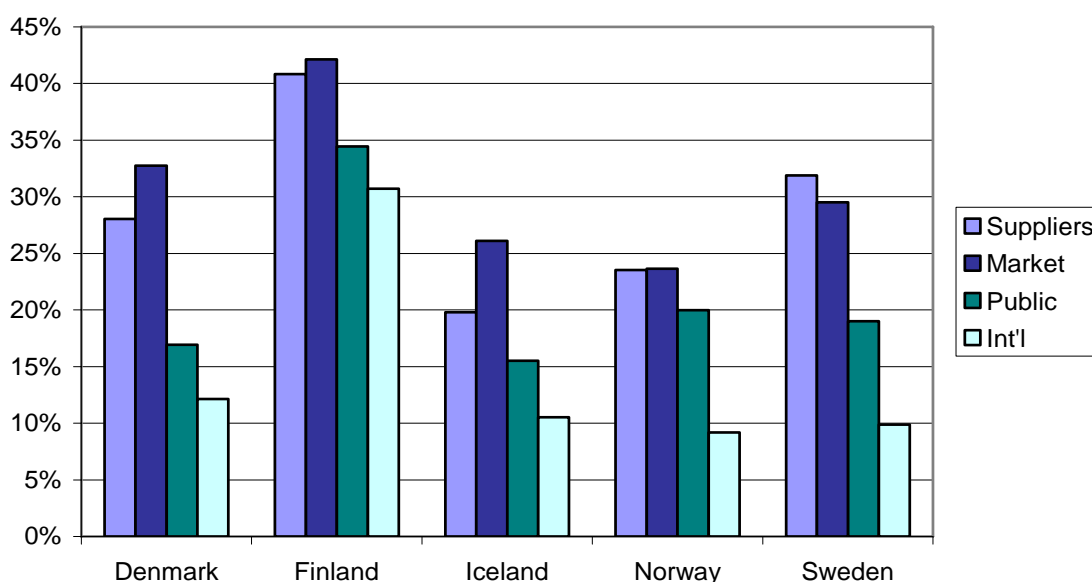
9.3. Increasing interaction with public research

A central goal of innovation policies is to enhance the exchange of knowledge through greater interaction, both among businesses and in particular with public research institutions. In many cases, R&D funding programmes require R&D cooperation with the objective of increasing overall impacts of funding resources. While this approach may have a number of benefits, it also poses additional challenges for addressing service innovation, as we discuss below.

While statistics show that service firms interact often with other firms, in particular customers, a general pattern is that services interact less with public research than manufacturing firms. While it may be the case that public research is of greater use to manufacturing firms, this low interaction still suggests that the potential benefits of public research for service are not being capitalised on. A central issue here is the types of interactions available or used, and the design of policy measures to promote business-science interaction.

Figure 9 shows shares of innovation active enterprises in the service sector with innovation cooperation for the Nordic countries. Market cooperation includes cooperation with customers or competitors, while public cooperation includes cooperation with universities or government research institutions. Figures for suppliers, market and public include cooperation regardless of geographic location of cooperation partner. International cooperation includes cooperation with any external partner located abroad, public or private.

Figure 9. Shares of innovation active enterprises with innovation cooperation, service sector, Nordic countries.



Source: Own calculations, CIS4 data. Based on Eurostat Core industries, 10 employees or greater. Innovation active enterprises include all enterprises with either a product or process innovation or product-process related innovation activities over the period 2002-2004.

As can be seen in the figure, Finland has by far the highest shares of innovation active enterprises with cooperation, regardless of type of partner. This difference is particularly large for cooperation with public research or international partners. Shares with cooperation with either of these types is over 30 percent for Finland, while corresponding shares in the other countries are around 15 percent for public research institutions and 10 percent for international partners.

9.4. Lessons and insights from policy interviews and other sources

Removing technological, manufacturing bias in the design of R&D programs: Studies indicate the while technological R&D is important for many service firms, it is often not the core of innovation activities. Focus in technological R&D is more towards new applications of existing technology. Business model and service product development activities often have important non-technological or cross-disciplinary elements. This has a number of important implications for policy. First, selection criteria that are solely based on the merits of research projects (i.e. on their contribution to existing research) will likely be 'biased' towards manufacturing. *Criteria that instead focus on final product novelty and knowledge diffusion to other firms may better reflect service R&D, while at the same time still keeping a rationale for policy intervention.*

The **Finnish Serve (Innovative Services Technology) programme** has two main focus areas. It seeks to increase and broaden services development within the Finnish industry and it also promotes academic research in service related areas. Serve programme supports Finnish companies and research organizations in development of innovative service concepts that can be reproduced or replicated and where some technology or systematic method is applied. The programme provides funding for challenging projects, where the novelty value is at least of national level. The project proposals are evaluated based primarily on the novelty of the service innovation, not necessarily on the novelty of the applied technology. For the Finnish businesses and research organizations Serve provides project funding, national and international networks through seminars and industry specific forums as well as tools to support product management and IPR questions.

The criteria in Finland's Serve program provide an instructive example of this. *Strategic R&D programs that are specifically oriented at less technological types of R&D (either generic or targeted at specific service sectors) would also be effective here (We will discuss this in greater detail below in the section on non-technological innovation.)* However, also here the specification of criteria for assessing projects has to be considered carefully. Norway has recently introduced a programme that supports broad forms of innovation across sectors. However, initial impressions are that service firms are generally unable to compete with manufacturing firms for funding.

The Research Council of Norway in 2006 introduced a new horizontal programme called **BIA (Programme for User-driven Research-based Innovation)**. The new programme replaced a set of sector specific programmes, including the PULS programme which was specifically directed towards R&D in service firms. The new BIA programme is open to research based innovation projects independent of branch and specific theme. The programme is to be open to research projects directed towards various types of innovation challenges such as i) new and greatly improved products, where development or innovative use of new technology is central in the projects, ii) new or greatly improved service products and services supporting various stages in the value creation process (e.g. logistics) and iii) new or greatly improved processes, where productivity and quality improvement is central. This might include innovative production methods, organisational forms, business models and forms of delivery.

Also, tax credits such as SkatteFUNN, are able to get around the issue of eligibility criteria. SkatteFUNN is a tax credit measure for enhancing R&D investments in Norway. It is primarily directed at SMEs, allowing a 20 % deduction of expenses for R&D projects. The measure is now also available to larger companies and has been very widely used, also by service firms²⁸. Service projects make up around 45-50 per cent of the entire project portfolio.

Greater flexibility in policy measures may be more effective in promoting interaction between service businesses and public research. A number of factors were identified with

The Danish **Business PhD program** is a cooperation between businesses and universities where PhD students spend half of their study at a university and the other half working and receiving training at a company. While the program does not specifically or explicitly target service firms, a number of PhD students have been placed in service firms.

implications for policy design. For example, service firms typically have a much shorter time horizon concerning R&D projects, and may not have a long term R&D strategy (Dialogic et al., 2006). Due to this, they may be reluctant to enter into longer research projects or collaborations. In addition, while many service firms may be able to benefit greatly from the expertise of public researchers, they may be less interested in entering a formal

research project. Hence, greater flexibility in program design may greatly enhance the attractiveness of cooperation with public research. As an example, take the Danish Business PhD program. This has been fairly successful and has also attracted attention in other Nordic countries. However, the requirement that firms must take on PhD students for a total of 1½ years may dissuade some potential participants. Innovation vouchers, first introduced by the Netherlands, are subsidy vouchers (from 2,500 to 7,500 Euros) that SMEs can use to purchase knowledge from public research institutions, and in some cases, also from large companies. The measure is open to all sectors, and has been very

The Danish **Knowledge pilots program** promotes the placement of knowledge intensive workers in small and medium sized firms that normally would not employ knowledge intensive personnel. The objective is to increase small and medium size firms' access to external knowledge, here under also academic research. Support is given through a subsidy for newly employed knowledge intensive workers. As with the business PhD program, this program does not explicitly target services, but has in practice been utilized by a number of service firms.

popular within services, with service companies comprising 40 percent of participants. The measure is also designed in a way that caters to service firms' needs. Service firms' collaboration with public research is often hindered by conflicting time horizons, where lengthy research projects do not fit well with service firms' innovation activities. In contrast, this measure does not require firms to enter into long term contracts. This measure has also recently been adopted in other countries, among them Denmark, Finland and Ireland.

Awareness: An often cited barrier to participation is all kinds of R&D-based measures in a lack of awareness or culture for investigating funding options. Hence, greater activity to promote and advise on available programs may have a significant positive impact.

Importance of evaluation and testing: Service innovation policy is a new and complex area, and lack of experience with policy measures may act as a significant barrier to policy initiatives in this area. Evaluation and testing are both important for policy learning and to garner wider support for promoting service innovation. This includes both new initiatives, but also to a high degree existing measures, where we lack hard evidence on both the use by service firms and impact on performance.

²⁸ NIFU-STEP (2007).

10. Promoting non-technological innovation – how and why?

As discussed above, broader forms of innovation are a central element of innovation activities in service firms and often technological and non-technological innovation are intermingled in service firms' product and process development. Take as an example the financial sector. Many financial firms are active in developing and applying advanced technological solutions, particularly using information technologies. However, many of these innovations have substantially altered the way financial businesses operate, requiring changes in their business models, organisational practices and client interfaces.

The role of non-technological innovation is evident in all types of service firms and activities, though in different ways. *Standard services* are typically performed by less skilled workers, with innovation activities traditionally focused on improving efficiency. Organisational innovation is thus important here. However, many standard services could become more innovative by involving workers in innovation processes, tapping into their first-hand knowledge and customer contact. For *expert services*, much new knowledge creation will often occur in the course of providing new solutions to clients, and in the form of new competences. An important challenge here is ensuring that new competences are diffused more broadly across the firm. For *client services*, an important dimension for innovation may be in terms of client interfaces, potentially involving IT based solutions.

Results from work in the ServINNo project (Bloch, 2007; Jensen and Vinding, 2007) provide an overview of the importance of non-technological innovation for service firms. This section will first examine these studies and thereafter discuss emerging policy trends within non-technological innovation.

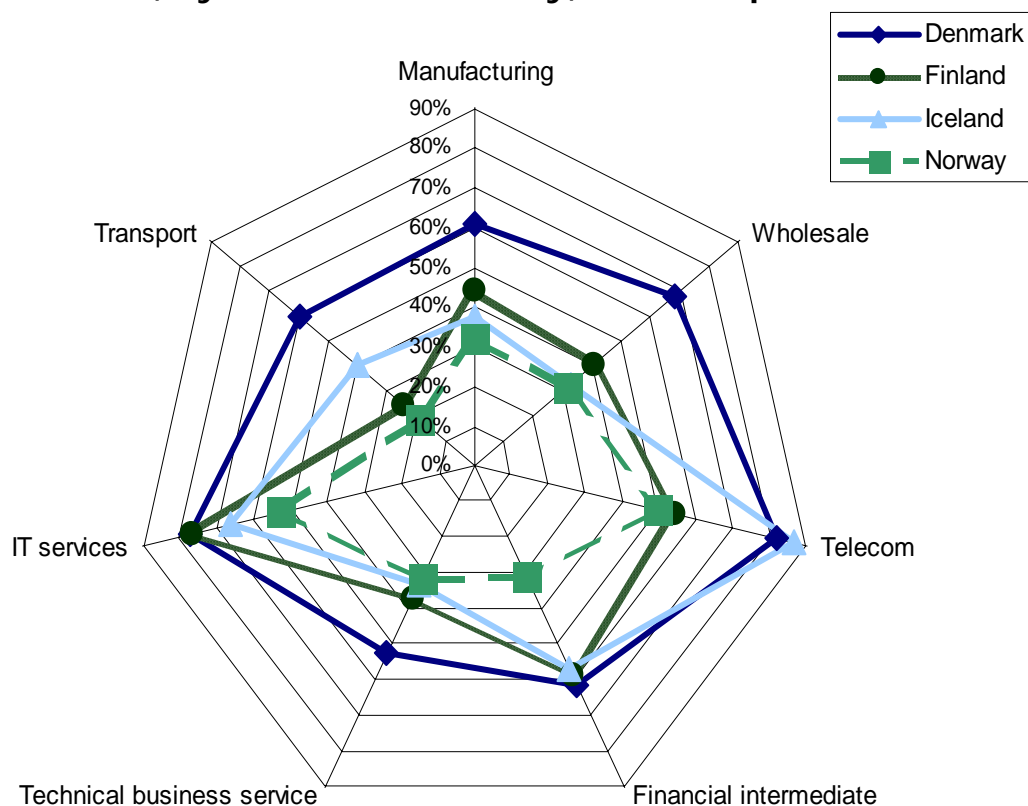
The Oslo Manual innovation concept includes four different subtypes: product, process, organizational and marketing innovations. An examination of simple combinations of innovation types may be useful to investigate a number of issues, particularly the prevalence of non-technological (ie marketing and organizational) innovation among technological (ie product and process) innovators.

The figures below show the use of non-technological innovation across sectors and countries²⁹. Figure 10 shows the share of firms with marketing and/or organisational innovation, and figure 12 shows shares of product-process innovative firms that have also implemented non-technological innovations.

Denmark stands out among the Nordic countries in having a markedly higher share of service enterprises with non-tech innovations, both in total and for enterprises with non-tech innovations only. While this share is much lower in Finland, Norway and Iceland, it is still the case that a high share of tech innovators have also implemented non-tech innovations.

²⁹ Data on organizational and marketing innovations are not available for Sweden.

Figure 10. Enterprises with marketing or organisational innovation, by sector and country, CIS4. In percent.

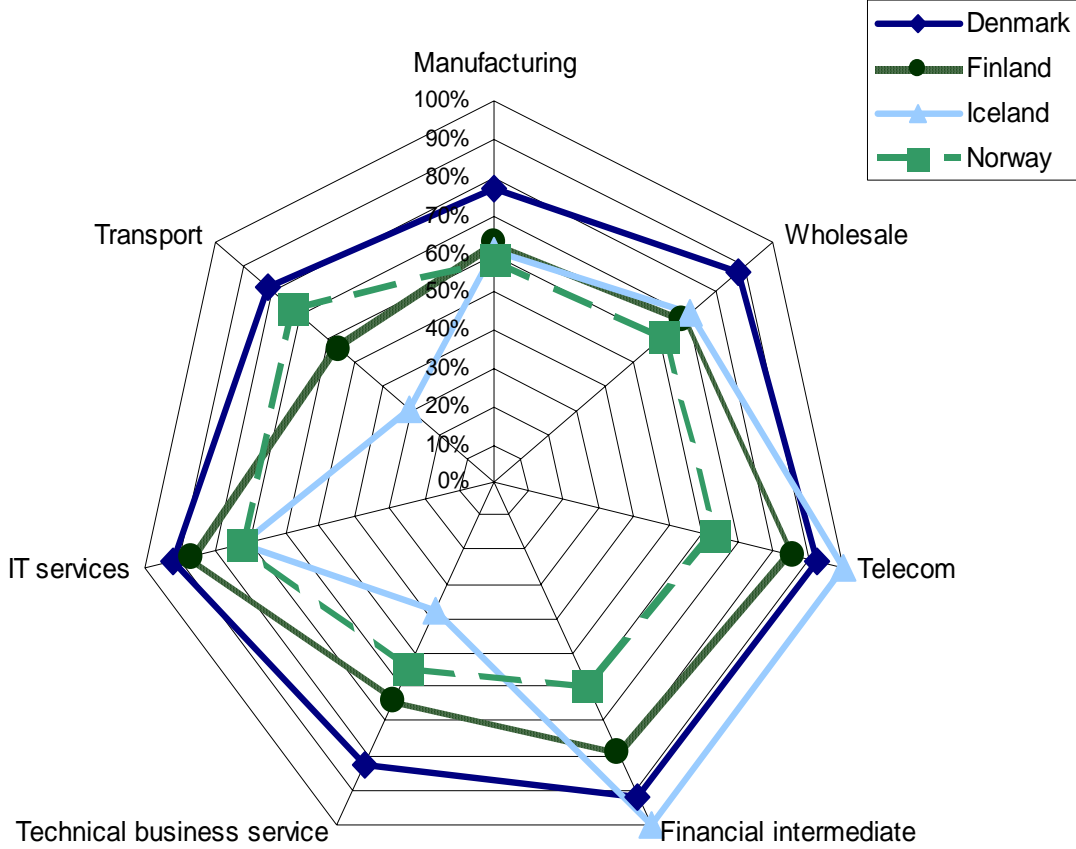


Source: Own calculations, CIS4 data. Based on Eurostat Core industries, 10 employees or greater. Data on organizational and marketing innovations not available for Sweden. Note also that for Finland, non-technological innovation refers to questions of organizational and marketing changes. Thus, results for Finland may not be fully comparable to those for the other countries.

While the overall share of enterprises with non-tech innovations for Finland is lower than in Denmark, it can be seen that non-tech innovation activity is quite high in selected Finnish sectors such as IT service and Financial intermediates. For Iceland there is a large amount of variation across sectors, with all product-process innovative enterprises having implemented non-tech innovations in some sectors (Telecommunications and Financial intermediates) and a small share in others (Transport and Technical Business Services).

In terms of totals, shares of non-tech innovations among Norwegian enterprises are slightly higher in services than in manufacturing. The highest share of soft innovators are in Financial intermediates and Telecommunications, while the highest shares of non-technological innovation are found in IT consulting and IT software.

Figure 11. Share Product-process innovative enterprises with marketing or organisational innovation, CIS4.



Source: Own calculations, CIS4 data. Based on Eurostat Core industries, 10 employees or greater. Data on organizational and marketing innovations not available for Sweden. Note also that for Finland, non-technological innovation refers to questions of organizational and marketing changes. Thus, results for Finland may not be fully comparable to those for the other countries.

Jensen and Vinding (2007) examine the use of systems of work practices (high powered work practices, HPWP) in services and manufacturing firms and their role in innovation. The analysis draws on Danish data covering both innovation and a range of work practices. Table 8 shows the use of work practices, based on data from 2006. Interdisciplinary workgroups are higher for service firms, in particular for firms where they encompass over half of the work staff. This lends support to the notion that innovation is more spread across functions in service firms. Use of quality circles is similar for the two sectors, though slightly higher for manufacturing. Systems of collection of proposals from employees reflect to what degree workers are involved in innovation activities. Shares are slightly higher in manufacturing, but in both sectors a large share of firms use this practice for over half of their staff. Delegation of responsibilities is higher for services, suggesting a flatter structure for many service firms. Integration of functions are used by around the same share of firms in manufacturing and services, though the share where integration is truly widespread (over half of employees) is much higher in service firms (34 to 18 percent).

TABLE 8, Descriptive statistics – manufacturing and service – 2006

	Pct. of the firms employees covered by the work practice	Manufacturing	Services
Interdisciplinary Workgroups	None	24	11
	Below 25%	27	21
	25-50%	25	24
	Above 50%	20	44
	Don't know	3	0
Quality circles	None	30	37
	Below 25%	23	19
	25-50%	21	15
	Above 50%	24	23
	Don't know	2	6
Proposals collection	None	28	31
	Below 25%	23	21
	25-50%	16	15
	Above 50%	30	23
	Don't know	3	6
Delegation of responsibility	None	4	1
	Below 25%	15	10
	25-50%	31	15
	Above 50%	50	74
	Don't know	1	0
Integration of functions	None	26	21
	Below 25%	29	23
	25-50%	21	15
	Above 50%	18	34
	Don't know	6	7

Source: Jensen and Vinding (2007).

Cluster analysis³⁰ shows that delegation of responsibilities is very widespread across firms, but concerning the other practices, service firms tend to either adopt them as a system, or none of them. Service firms adopting systems of work practices are also more innovative: 73 percent implemented a major organisational change (compared to 38 percent for firms that had not adopted the work practices) and 62 percent introduced new products or services (compared to 36 percent). This difference in innovativeness was found both for novel innovators (18 percent compared to 9 percent) and less novel innovators (44 compared to 27 percent) (Jensen and Vinding, 2007).

10.1. Trends in non-technological innovation policies

There has been substantial focus on the promotion of non-technological innovation, both at the EU and national levels. While there is broad support for promoting non-technological innovation, it is less clear how such policies should be designed or what

³⁰ The cluster analysis was based on data from 2001. See Jensen and Vinding (2007).

exactly they should promote. However, a number of promising initiatives are beginning to emerge, that may also guide further policy formation to support other forms of non-technological innovation. One basic characteristic of these approaches is that, as opposed to promoting innovation in firms' general operations, they seek to promote new techniques for product development or how firms innovate.

The greatest focus in this respect has been on the user in product development activity, but others may also be emerging, such as employee driven innovation and creativity (Damvad, 2007a).

User driven (or people-centred) innovation involves the use of advanced, systematic methods to examine, uncover user/customer needs, and looking at what customers might want or need as the main source of ideas for product development. There has been strong interest in this in Denmark, with policies initiatives in more than one ministry. A main driver behind this has been growing concerns in Denmark that a narrow focus on technological R&D will fail to fully capitalise on R&D investments and that innovation policy should focus more broadly on non-technological innovation such product development processes and research on customer needs. Among the policy measures considered (and many already initiated) are: funding programs for the collaborative development of new techniques for user-driven innovation; promoting education on the topic, promoting industry-science cooperation (often of a cross-disciplinary nature); Knowledge spreading through the creation of centres, networks, publications and studies to increase awareness. User-driven innovation programs have also been implemented in Finland.

To a certain degree, the objective of policy support of user-driven innovation is to promote the use of product development methods that are typically used in creative industries such as design services. Policies, for example in Denmark and Norway, have both sought to strengthen the design service sector and promote the use of design services through subsidies.

Important parallels can be drawn with ICT policies, that both promote the development of ICTs and the ICT sector and also the greater use and application of ICT in other firms. This approach may be applied for other knowledge intensive services; ie. key KISAs can be identified and promoted both by strengthening firms in the sector and promoting use of advanced methods by other firms.

DesignDenmark

The Danish government has recently implemented a number of initiatives to strengthen framework conditions for design-based firms. Importantly, this design innovation strategy has also targeted non-design firms with the goal of increasing the use of design-based approaches in other sectors. Here the objective is to go beyond the use of design in the final styling of products and promote the incorporation of design throughout innovation processes¹. The main elements of the policy initiative are: creating a more commercial, business oriented design education; the Danish Design Centre, providing advice and support selected industries and regions; a service design initiative for developing user-friendly services; informing and assisting on available options for registering design-based IPRs and strengthening enforcement; and branding and promoting Danish design sectors internationally.

Design services in Norway

Innovation Norway. In cooperation with firms and designers, Innovation Norway and the Design Council has sought to influence more Norwegian firms to make use of professional designers by contributing with consultancy services adjusted to each individual firm. The Ice Breaking Measure is a funding scheme for SMEs using design services for the first time. The measure is mainly to be used in central areas of Norway. The goal of the measure is to contribute to increased use of design as a competitive force in Norwegian business life, recognizing that the linkages between firms and designers in Norway are weak.

Employee driven innovation seeks to increase the individual employee's involvement in firm innovation activities, gearing management and organizational structure to encourage and capitalize on worker-driven innovation: (through) norms/culture, work teams, devoting resources (worker time) to innovation, including as part of overall innovation strategy, systematic process, contacts and information flows. Among the policy measures considered here are: Increase awareness; Support development of new methods and tools for worker driven innovation; Knowledge centre (training, communication, advisory support, etc.); Public sector implementation.

11. Horizontal and framework policies

11.1. Removing market and regulatory barriers to service innovation

In comparison with manufactured goods, service innovation is more often hindered by overall framework conditions that impact the way businesses operate. A key element of the horizontal policy approach involves assessing these barriers, both at the EU and national levels, and how policy can remove barriers to service innovation and create a more 'innovation friendly' environment for service firms. At least the following types of issues are relevant in this context:

- Internal markets and implementation of the Services Directive³¹
- Visible and 'hidden' market barriers on the domestic markets, for instance the public sector provision of certain services
- Administrative burdens
- Service innovation culture and consumers propensity to adopt new types of services

The EU has been a driving force in removing market and regulatory barriers. All the Nordic countries are committed to implementing directives towards the full implementation of the Services Directive. In particular, Denmark and Norway are farthest along in implementation (see figure 12).

However, as a number of interviewees pointed out, implementation of regulations is a key area where innovation can be more 'thought in' to other policies. In particular, *how* and *when* regulations are changed or implemented can be important factors for firm competitiveness.

Electronic reporting and information service

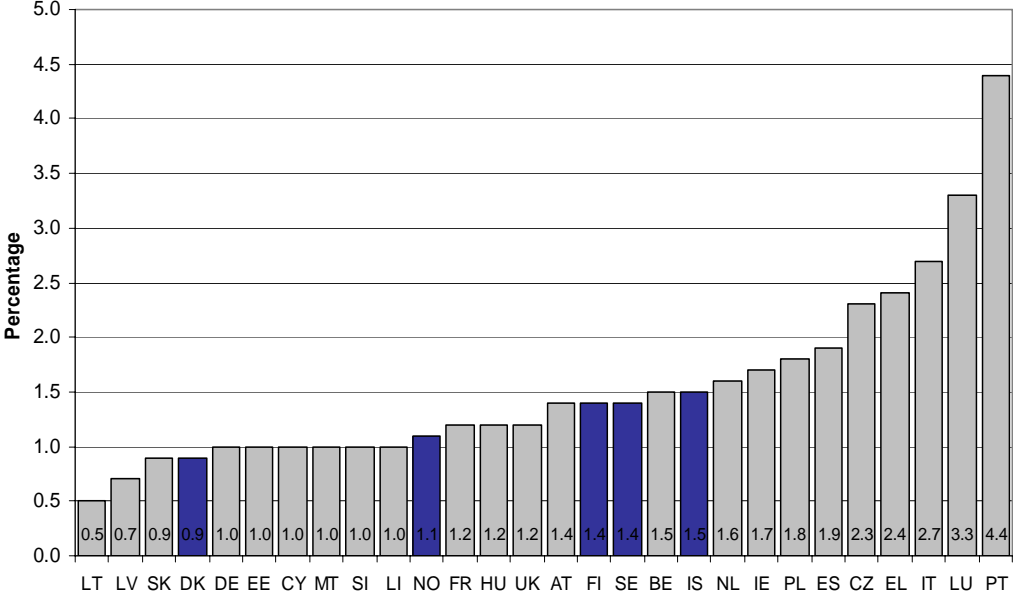
A number of Nordic countries have launched electronic portals that serve as 'one-stop-shops', where businesses are able to take care of all their government reporting via a single website. These measures also strive to harmonize reporting procedures and to ensure that the same information does not need to be reported more than once. The same type of portals have also been established to provide access to all relevant government (and other) information for businesses. In both cases, the implementation of these measures has required the extensive collaboration of a number of government agencies.

For example, obtaining a first mover advantage, operating under the same regulations as important lead markets, and having the most advanced regulatory systems can all add to service firms' competitive edge compared to foreign firms. Again, this points to the value of involving key stakeholders in the implementation process.

In addition, a number of Nordic countries have taken on the EU's recommendation to reduce administrative burdens for businesses by 25 percent by 2012. A key tool in these reductions has been e-government solutions. In this way, the reduction of administrative burdens is also linked to efforts to improve information access for firms, and business support services in general.

³¹ European Commission (2006a).

Figure 12. Internal Market Scoreboard. implementation gaps for EU directives



Source: European Commission, 2007a, Internal Market Scoreboard No. 16.

11.2. IPR and standards

While patents are an important instrument for protecting IPRs in manufacturing, multidimensional service innovations may not meet the requirements for protection through patenting. IPRs are often argued to be too expensive to defend or insufficiently enforced³². However, the need for adequate protection of IP in services is increasing as a greater share of service firms is conducting R&D³³. Instead of IPR, service firms very often rely other informal ways of IP protection such as: secrecy, publishing, technical protection, documentation, restricted access to knowledge, and fast innovation cycle (see European Commission, 2007d). This suggests that for many service firms, it makes more sense to consider IP management on a broader scale as opposed to specific types of formal protection. This also fits in well with many of the ideas behind open innovation (eg. Chesbrough, 2003); i.e. that IPRs should be considered more as a tool to manage intellectual property in its interactions with others, than solely as a method to protect property rights.

One-stop Contact points
 Acquiring relevant information and complying with government regulations can pose a significant barrier for service SMEs. The Netherlands has introduced contact points or front offices for a wide range of industries. The measure is part of a broader entrepreneurship policy to simplify access to innovation support information. Support services from several government agencies have been combined into joint front offices that cater to specific industries. Of the in all 30 contact points, 8 provide support to service industries (Financial services, Business services, Wholesale and retailing, Transport and logistics,

Based on this, it has been argued that IP management should be a part of general business support; i.e. that information on IPRs and IP management should be integrated with other support services. Policy efforts in countries have been mainly directed at increasing awareness

³² Green et.al. (2001).
³³ European Commission (2007b).

among service firms of available options for IP protection and stepping up efforts to enforce IP rights. Some examples are the Netherlands, which have integrated patent information services with those of other government agencies (see box above) and a Danish initiative to promote the registration of designs, as part of a policy package to promote Danish design.

Table 9 shows the use of formal protection methods for Denmark, Finland and Norway (data unavailable for Sweden and Iceland). On the whole, the use of legal protection methods is just as prevalent in services as in manufacturing. However, reliance on specific types of methods differs to a larger extent. As the table shows, patenting is less used in service enterprises, while registration of trademarks and copyrights are used just as often for service enterprises. While use of legal protection methods such as patenting and trademarks among manufacturing enterprises is highest in Denmark, concerning service enterprises shares are highest in Norway.

Table 9. Use of legal methods to protect innovations, Denmark, Finland and Norway, CIS4, percent.

	Applied for a patent	Registered a trademark	Registered an industrial design	Claimed copyright
Denmark				
Manufacturing	27%	28%	12%	10%
Core Services	11%	22%	6%	9%
Wholesale trade	12%	21%	8%	5%
Transport	11%	24%	1%	4%
Telecommunications	2%	26%	0%	0%
Financial intermediation	1%	27%	2%	24%
IT services	11%	26%	9%	15%
Technical business services	18%	17%	1%	11%
Finland				
Manufacturing	23%	20%	13%	2%
Core Services	13%	21%	5%	3%
Wholesale trade	14%	26%	11%	5%
Transport	4%	14%	2%	0%
Telecommunications	11%	13%	0%	2%
Financial intermediation	4%	9%	1%	1%
IT services	19%	33%	3%	8%
Technical business services	22%	12%	2%	1%
Norway				
Manufacturing	20%	20%	9%	9%
Core Services	14%	26%	9%	15%
Wholesale trade	19%	38%	17%	17%
Transport	4%	8%	1%	4%
Telecommunications	4%	17%	4%	15%
Financial intermediation	0%	6%	0%	2%
IT services	6%	29%	3%	23%
Technical business services	26%	15%	7%	14%

Source: Own calculations based on CIS4 data. Share innovation active enterprises.

In general, the highest shares of innovation active enterprises that use legal protection methods are found in Technical business services, followed by IT services. A relatively high share of enterprises in Wholesale trade use protection methods in all three countries, though shares are particularly high in Norway. A higher share of Finnish enterprises within Telecommunication and IT services have applied for patents, while for Transport legal protection methods are more often used by Danish enterprises.

Standards can provide useful platforms for the exchange of knowledge with a positive impact on innovation. However, standards for services are much less developed than for manufacturing, and also with less harmonization across countries. While these

The Norwegian government has announced and begun implementation of a **national strategy for standardisation**. The strategy is expected to be completed by Standards Norway in February 2008 and will be based on the work of a 41 person reference group. The objective of the strategy is to propose strategic goals for how standards can be used as a tool to promote innovation and growth. In the work process, special emphasis has been given to identifying the needs of SMEs and to examine new areas for creating standards, particularly in the service sector.

areas have received increasing attention (in particular in Norway; see box above), it has also been noted that our current knowledge of their role for service innovation is fairly limited³⁴.

11.3. Strengthening the knowledge base for service innovation through education and labour market policies

Human resources play a vital role in service companies. Service innovation and the growth of service sectors are dependent on skills and creativity and on the availability of knowledge workers. This places a high priority on education policies to both improve the quality of education and to increase enrolment in higher educations. In addition to a high academic level, recent studies³⁵ have also emphasized the importance of multidisciplinary education in promoting innovation and creativity. The increasing demand for knowledge workers places demands on labour market policies to ensure an adequate labour supply, a flexible labour market and the ongoing development of worker competences. Finally, it needs to be acknowledged that service innovation is not only based on formal higher education. Many innovative services are labour intensive and they cannot be realised without a highly skilled and motivated 'manual' labour force.

11.4. Entrepreneurship and finance

Entrepreneurship is at the heart of service innovation and entrepreneurship policies are interrelated with a number of other policy areas that are essential also for service innovation. Key focus areas of entrepreneurship include: development of a conducive environment, harnessing culture and education, and encouraging entrepreneurship in under-represented groups. All of the afore-mentioned areas are also highly relevant for horizontal service innovation policy.

A lack of available financing can be a significant barrier for innovation in service companies. While established service companies may have sufficient access to financing options, for young SMEs in the service sector, financing challenges may be just as difficult as for high tech SMEs and start ups³⁶. However, financing and advisory needs

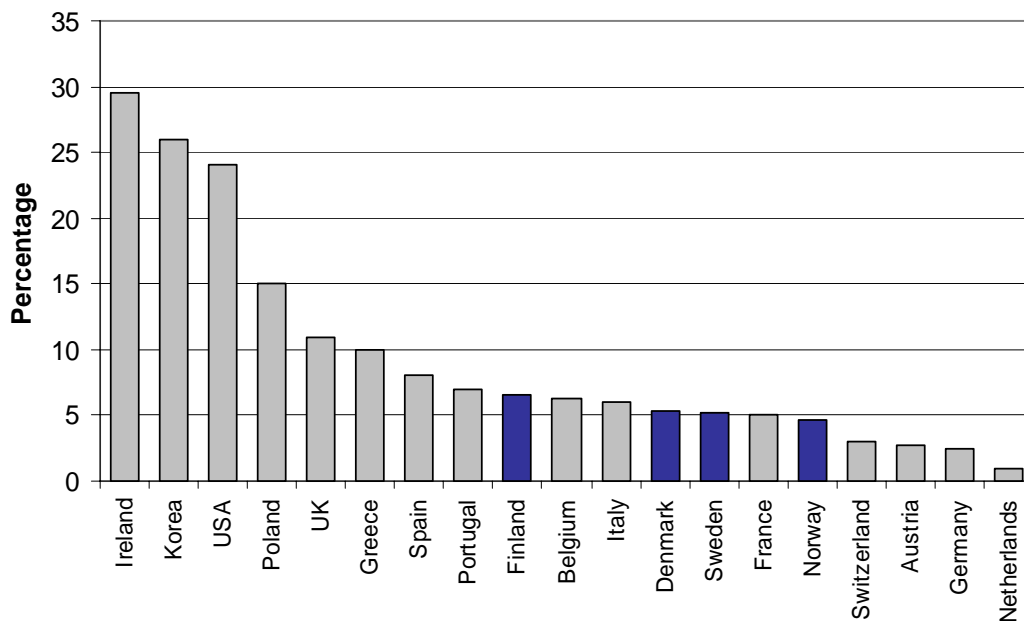
³⁴ Blind (2006).

³⁵ European Commission (2002).

³⁶ Bundgaard-Jørgensen (2007).

may be of a very different character for service firms, with implications for the design of financing instruments, evaluation of investment and training programmes for start-ups.

Figure 13. Shares of high growth firms, 2004



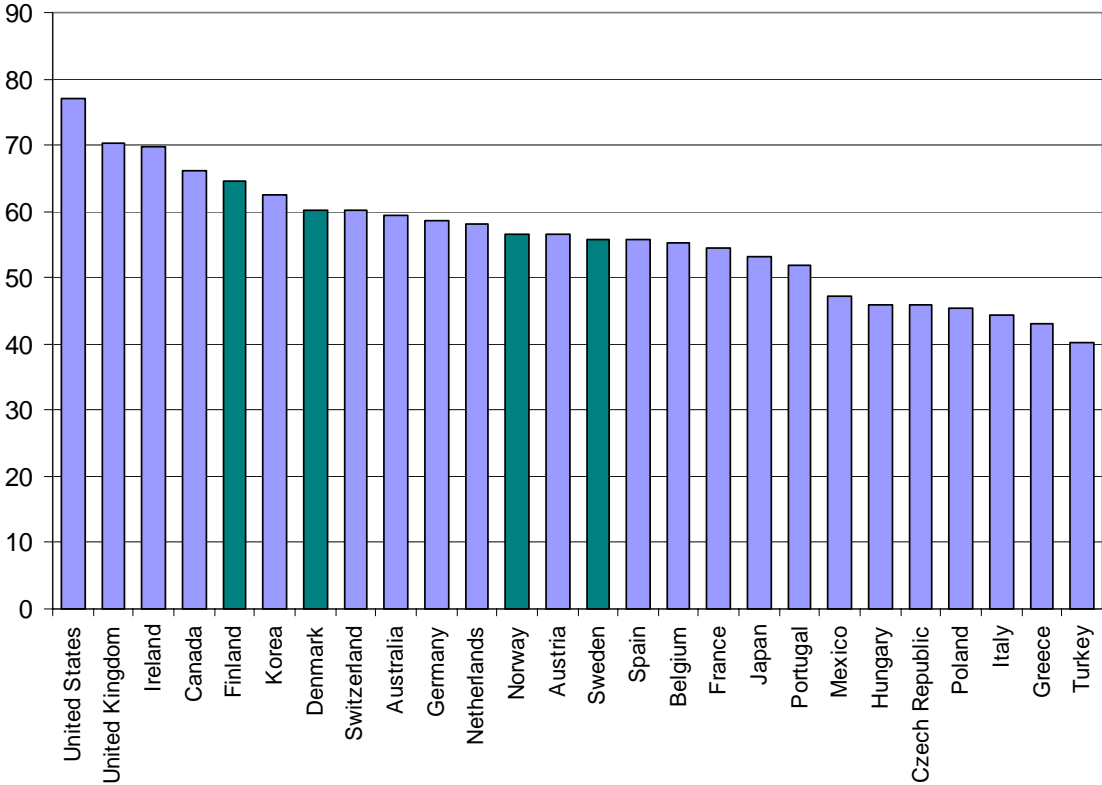
Source: Hoffmann and Junge (2006). Share firms with average revenue growth of over 20 pct. for period 2001-2004.

The aims of entrepreneurship policies are to increase the number of start-up firms and the number of firms that become successful with rapid growth. However, as Hoffmann (2006) points out, the focus should clearly be on the latter, since it is here that Nordic and many other EU countries are lagging behind. The figure above shows shares of firms with high revenue growth over the period 2001-04 (data unavailable for Iceland). Among the Nordic countries, Finland has the highest share, though all Nordic countries lie well behind leading countries.

A number of countries have implemented comprehensive entrepreneurship policy strategies, that touch on a number of areas (advisory support, financing, entrepreneurial education, administrative burden, investment rules). Examples of financing initiatives are government loan guarantees that include extensive coaching and business support.

Given that entrepreneurship encompasses so many things, it is difficult to measure status or progress. FORA in Denmark has developed an overall index of framework conditions for entrepreneurship, based on 66 indicators covering an array of aspects deemed to influence entrepreneurship (Danish Enterprise and Construction Authority, 2007). Finland ranks highest among Nordic countries, followed by Denmark.

Figure 14. FORA Index of Framework Conditions for Entrepreneurship, 2004.



Source: Danish Enterprise and Construction Authority (2007).

Entrepreneurship policy and service innovation. Measures to promote entrepreneurship are typically generic, targeting all firms or SMEs. For many of these areas, such as the reduction of administrative burdens, policy measures are likely to benefit service and manufacturing firms alike. In other areas, however, effective policy delivery requires taking account of often significant sectoral differences. An example here is financing measures. The type of advisory support needed for small service firms will typically differ greatly from that for high tech start-ups. And while loan guarantee measures can be considered relevant for a wide range of start up firms, high risk capital is generally focused on high tech industries such as ICT and biotechnology. While there clearly is a demand for greater supply of venture capital to small high-tech firms, there is also substantial high growth potential in service sectors. Policy may have important role to play here in ensuring that adequate capital is channelled to the most promising service projects.

11.5. Demand-side policies

Increasing attention has been placed on the potential role of demand-side policies in promoting innovation³⁷. Demand-side policy measures seek to increase either the motivation or the likely success of innovation by acting upon the demand side issues. That is, the specification and purchase of innovative goods and services. Ideally,

³⁷ European Commission (2007c) and Georghiou (2006).

demand-side policies focus on areas and markets that industry itself has already identified as critical to its future, and it is thus market forces that will drive innovation forward. Existing demand side policies can be presented in three main groupings:

- Systemic policies which include cluster policies and supply chain policies
- Regulation, of which examples include: use of regulations & standards to set innovation targets, and technology platforms to co-ordinate development
- Procurement initiatives such as:
 - R&D procurement
 - Public procurement of innovative goods, and
 - Support for private procurement

In Finland demand-side measures are being developed, such as public sector procurement of innovative goods and services. Procurement of R&D services is an on-going service innovation measure and more procurement related activities are being planned. The Domestic Help Credit programme is encouraging consumers to purchase domestic services from outsiders. According to Finnish Tax administration, tax credit for domestic help continues to be very popular.

In Sweden, the government is planning to outsource some public sectors services, effectively creating demand for new and innovative services. Sweden has also launched tax reductions for households to buy domestic services.

On the demand-side, service innovation policy is taking its first steps, even much more so than in the case of supply-side measures. At the same time, the concept of demand-side policy is not very well known, with the result that we are not recognizing many demand-side policy initiatives that already exist. Such measures may include, regulation related changes, cluster related and other systemic policies, and demand-side measures in connection with regional development initiatives.

Public-private partnerships create a platform for interaction that can play a key role in the development of service innovation policy measures. For instance, voluntary associations that host key decision makers from various fields of society, can be very influential. The aim of such associations could be the strengthening of service innovation policy. In practice, they can promote the service innovation agenda and develop new ideas and recommendations for policy actions.

11.6. Regional and cluster policies

While regional innovation policies include regional development and cluster policies, there are also important issues in terms of overall policy coordination. First, national and regional policies will need to be coordinated to ensure effective delivery. Second, many (national) policies may be most effectively delivered at the regional or local level, implying that their implementation may require coordination across policymaking institutions. Finally, the role of innovation promotion is increasing in the regional policy context, creating a clear role for service innovation policy in the regional context.

In Sweden innovation and growth issues are primarily placed on the regional level, except for R&D programmes that are mostly national. The regional approach is expressed in a National strategy for competitiveness, entrepreneurship and employment³⁸. The four initiatives that form the framework for regional achievements are: Innovative environments, Entrepreneurship, Accessibility and Cross-border cooperation. A number

³⁸ Swedish Ministry of Enterprise, Energy and Communications (2007) "A national strategy for regional competitiveness, entrepreneurship and employment 2007-2013", Stockholm, Sweden <http://www.finans.regeringen.se/sb/d/8739/a/77417>

of service sectors are identified here as important. In addition to financial support, the regions provide start-up advice, skills programmes (IT, export etc), incubators, academy relations, entrepreneurship programmes, clustering initiatives including network arenas, steering groups, business development etc. By establishing a *National forum* the Government wishes to create an arena for an ongoing political dialogue between national and regional representatives, taking the national strategy and the regional development strategies as a starting point. Political representatives from every county participate in the forum.

12. Conclusions and policy implications

This report has sought to examine service innovation policy in the Nordic countries. In doing so, we have drawn on statistical analysis and a case-based typology of service activities. In addition, the analysis has benefited from insights from interviews with policymakers and key stakeholders in the Nordic countries. This final section summarizes the policy implications of this report.

Examining service innovation policy is a complex task. A wide range of policies may support service innovation, which also includes policies that promote a broader, multidimensional concept of innovation, and many policies that are 'generic' or apply to all sectors. However, many generic policies may be biased towards manufacturing in their design or focus. For these reasons, we began the report by pointing to four dimensions of policy that require investigation in order to gain a full view of service innovation policy:

- Use of broad policy goals to promote service innovation
- Policies that promote aspects which are of key importance for service innovation
- Policies with an explicit focus on promoting service innovation
- Generic policies that are relevant for service firms

Effective service innovation policy requires action along all these dimensions. A broad based approach is particularly important for the successful implementation of service innovation policy. An important part of an approach to target service innovation is the reanalysis and adjustment to existing policies, both innovation policies and other policy areas. This is likely only feasible with a broad political mandate.

And, as we have seen above, service innovation is more than technological innovation, and while many firms may engage in technological R&D, it is often not at the core of their innovative activities. Hence, promoting service innovation means taking a broader approach to innovation policy. An explicit focus is also important. This does not mean that policies without a visible focus on service innovation do not benefit service firms. Many existing policies do. However, their impact and likely also their design would be different if these policies explicitly took account of service innovation.

Finally, targeting service innovation does not necessarily mean policies that specifically target the service sector. Many generic or sector neutral policies are relevant for service firms, though explicit focus is needed to ensure effective impact on service innovation.

The box below summarizes the main implications of this report for service innovation policy.

Box 2. Key themes in service innovation policy

Broad based policy approach

- Particularly important for services
- Coordination of policy areas
- Coordination of policymaking institutions

Services as explicit focus area for innovation policy

- Establish mandate for promoting service innovation
- Thinking service innovation into generic policies
- Policies directly targeting services

Adjusting R&D policies to better target service innovation

- Funding criteria
- Broaden focus to include non-technological innovation
- Tax credits

Interaction with public research – greater flexibility

- Flexible forms of cooperative arrangements
- Multidisciplinarity
- Public research as provider of knowledge intensive services

Promoting non-technological innovation

- Client interaction, demand driven innovation
- Promote use of design, creative approaches
- Promote KISA as enabling technologies

Stakeholder involvement in policy design and implementation

- Two-way channel for business support and policy learning
- Engage established firms (in both manufacturing and services) in promoting service innovation policy agenda

Regulations and competition policy

- How and when regulations are implemented impacts service innovation
- Stakeholder involvement important

Improving access to financing

- Financing needs both at start-up and later growth stage

IP management

- Awareness, better enforcement
- Broader focus: promoting IP management (both formal and informal methods)

Demand-side policies

- Potential for service promotion through demand side policies
- Awareness of impact of public procurement on service innovation

Policy Learning

- Evaluate and measure
- Being lead country means experimenting
- Stakeholder involvement
- Interactive forum with policymakers in other countries, researchers

A broad based approach is an essential and challenging element of effective service innovation policy. The countries that have adopted a comprehensive policy that recognizes that innovation is impacted by a broad range of policy areas have gain more widespread support for innovation policy and have been much more effective in implementing coherent policies. Service innovation should be an explicit part of this policy agenda. This provides an important mandate for taking into account the specific needs for service companies and for realizing the often complicated coordination activities needed for service innovation policy implementation. This point is relevant for both service-specific and generic policy measures. While clear evidence can be found for extensive use of some generic policy measures by service firms, overall impacts will likely be greater if service innovation is stated as a clear aim.

Broad-based policies necessitate coordination among both institutions and policy measures. There are a number of potential obstacles here that may complicate this. Hence, this coordination is facilitated if it is made a part of overall innovation strategies, making coordination part of the policy mandate. Coordination can involve both formal (such as interministerial departments) and informal arrangements.

Intricately related to this coordination issue and the effective design of all policies is **the importance of stakeholder involvement.** In order to effectively design service innovation policies, policymakers are dependent on the first hand experience and expertise of businesses and other actors. Stakeholder involvement may have additional positive results, such as garnering support for measures and the active engagement of key companies in their implementation.

Innovation patterns vary across service activities, with important implications for policy. **Expert services** have high knowledge competences and may often conduct technological R&D, though this will often not be at the core of development activities. High customization and client interaction, combined with the fact that much knowledge is embedded in the individual worker, complicates the systematic organization of innovation activities. An important element here is choosing the right projects and the right customers (Skjølsvik et al., 2007). Beyond their role as a direct source of productivity growth, expert services have an important role in the innovation system as a source of new knowledge for other firms. Hence, interactive projects and procurement policies may be helpful tools in promoting and diffusing innovation activity of expert services. **Specialized services** also have a high knowledge component, but may be more standardized in terms of the skills and methods used. Hence, improvements in regulations, standards and platforms can be important facilitators of innovation for these activities. For **client services**, the role of the user is also important, though there may be less focus on innovation. Non-technological forms of innovation, such as user-driven innovation and new business models, are likely to be of greatest important for client services, along with IT applications. **Standard services** are less technical, with a higher share of low-skilled labour. A main focus area here for innovation is introducing a systematic approach to business renewal, and involving all workers in innovation processes.

In order to better target service innovation, R&D policy needs to adjust criteria and programs to better fit service innovation. There are good arguments for doing so: while services R&D may not be able to match manufacturing R&D on technical merits, impacts in terms of productivity and knowledge diffusion may be just as great. In addition, greater flexibility in the forms of industry-science interactions may greatly increase the usefulness for service firms. And, as many service firms may not be accustomed to seeking policy support, efforts to increase awareness of the availability of policies may also be useful.

There is fairly wide acceptance of the importance of non-technological innovation, but less on the role of innovation policy. One approach to **promote non-technological innovation** that has begun to emerge may have broader applications in this area. This

essentially **treats knowledge intensive services as enabling technologies, supporting both their development and promoting use by other firms.** An example here is design services in Denmark.

The blurring boundaries between manufacturing and services have a number of important implications for service innovation policy. First, **service innovation policy is relevant for a broad range of sectors, in many cases representing a broadening or reorientation of innovation policies.** There are for instance examples where service innovation policy is actually directed at manufacturing firms (E.g. Finland and Germany). This importance across sectors also emphasizes the importance of attaching a more visible profile to service innovation. Second, **large established manufacturing companies can play a key role in putting service innovation on the policy agenda.** Third, **blurred boundaries underline the important role of knowledge intensive services as an enabling technology, regardless of whether outsourced or developed in-house.** For example, the productivity gains of technological R&D and goods development (and thus also R&D incentives) may in many cases depend on potential for attaching services to the final product packages.

For many service firms, it is more instructive to consider IP management more generally than just the protection of IPR, as options for IPRs are lesser. While government should work to improve protection of IPRs for services, **IPR policy should have a broader perspective. One implication here is to include IPR support services as part of broader business support functions.**

Linking government guaranteed loans to advisory support seems a promising way to both improve access to funding for service start-ups and increase their chance of success. However, larger high risk capital that may be important for rapid growth is mainly limited to high tech firms, despite the fact that many potential high growth firms may be within services. **There may be large potential gains to government efforts to improve access to (or the quantity of) risk capital for service firms.** This area requires further research and deeper understanding of the specific challenges typical of the service enterprises. For instance, valuation of intangibles is essential and needs to be developed in the services context.

Framework policies will have a significant influence on the service innovation and related policies. Overall, competition policies and regulation bear strong direct and indirect influence on the services innovation. For instance environmental regulation may create significant demand for various types of expert services and innovative solutions. Also the implementation of services directive will affect regulation in member states. Especially the requirements to offer information to also overseas service firms will in practice mean an extra impulse for E-government, smarter and less complex regulation and internationalisation. All this will create further scope for service innovation.

Education policies in the Nordic countries stress the improvement of math and science competences. While there are good reasons for this, policy should not lose sight of the fact that multidisciplinary may be just as vital an element of education and training.

There are a number of examples of demand-side innovation policies in the Nordic countries. Recent studies have pushed to increase this, arguing for the benefits of using government procurement as an innovation tool on a broad scale. Given the size of the public sector and its purchases of goods and services from businesses, procurement policies are likely to have a significant impact on business innovation, both intentionally and unintentionally. It is thus advisable for government to be explicitly aware of how their procurement practices affect competition and innovation in businesses.

Finally, **policy learning is essential for effective policy delivery and can be pursued along a number of channels.** Service innovation policy is a new and complex area, and lack of experience with policy measures may act as a significant barrier to policy

initiatives in this area. Evaluation and testing are both important for policy learning and to garner wider support for promoting service innovation. This includes both new initiatives, but also to a high degree existing measures, where we lack hard evidence on both the use by service firms and impact on performance. In addition, efforts to increase awareness of service innovation and available policy measures also provide an opportunity to learn more about potential barriers to participation in policy programmes. Finally policy experiences in other countries are a very valuable source of information that can be pursued both bilaterally, but also through the establishment of networks of policymakers and researchers within service innovation.

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