Mapping Innovation Policy in Services (IPPS)

Country Report Germany

Report for the Finnish Funding Agency for Technology and Innovation (Tekes) and the German Ministry of Education and Research (BMBF)

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Policy actors addressing service innovations in the innovation system

With regard to the German innovation system, there are political actors on the Federal, State or *Länder*, as well as regional level who support service innovations by concrete measures (see fig.). Apart from this, different initiatives were started in the recent past to strengthen the German innovation system as a whole and to improve integration among the political levels. After outlining the three political levels briefly, the report on hand focuses the Federal level.

Policy Level	Policy Actors	Service Innovation Policy Focus
Federal	§ Federal Ministry for Education and Research (BMBF)	§ Services Research
	§ Federal Ministry of Economics and Technology (BMWI)	§ Federal support of economic development § Structural service economy issues
State	§ Ministry of Economic Affairs, Baden-Württemberg § Ministry of Economic Affairs, North Rhine-Westphalia	§ State/*Länder* support of economic development § Transfer from research into practice § Research infrastructure improvement
Regional	§ Regional, municipal, and local authorities § Trade and professional associations	§ Support of innovation cluster development § Support of regional development § Infrastructure improvement

Fig.: German policy actors adressing service innovation

Policy actors

At the Federal policy level the leading policy actors who are responsible for service innovations are the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Economics and Technology (BMWI). The Federal Ministry of Education and Research has pursued its own service research programme since several years. Apart from this, services are represented as a cross-sectional topic within other research programmes (like in IT research programmes, etc.). The activities of the Federal Ministry of Economics and Technology (BMWI) stronger aim at nationwide measures for the support of economic development, from which service companies make a growing profitit. The Federal Ministry for Economics and Technology is also responsible for the structural aspects of service sector regulation (e.g. "services directive“).

At the State or *Länder* policy level, above all the economic ministries of Baden-Württemberg und North Rhine-Westphalia (NRW) support concrete measures to foster the service sector. Both *Länder* started systematic action programmes in the past to strengthen the service economy. The range of activities reaches from measures to support the regional economic development, via activities to improve the mutual transfer among service economy, politics, and service research, to smaller support activities (analyses, for instance). The latter address the regional service research.

Finally, there are also activities at the regional policy level. At least implicitly, these activities aim at strengthening the service economy and at supporting service innovations. Policy actors on the regional level are, above all, regional, municipal, and local authorities as well as regional networks beside trade and professional associations. The activities focus on an improvement of regional structures, on a support of innovation cluster development, and on infrastructure improvement. Against the background of an increasing change of the economic structure (Ruhr area, etc.), these support measures are more and more directed towards services.

Special policy innovation initiatives

A special form of promoting innovations on different policy levels has been the initiative “Partners for Innovation”, a public private partnership that has been launched by the former German Federal Chancellor Gerhard Schröder. It is a voluntary association of well known individuals and institutions from science, politics and society with the common goal of contributing to strengthening innovation in Germany by joint activities. Within this initiative, 15 thematically specialising impulse committees were established to develop

new ideas and recommendations for action relating to a range of different subjects of innovation and to initiate distinct innovation projects. One of the impulse committees has dealed explicitly with the subject of services. Headed by IBM Deutschland GmbH and Roland Berger Strategy Consultants, the impulse committee - consisting of more than 20 partners from science and economy - has adopted the ambitious goal of contributing to a change of perception of services. For this purpose, the members have presented recommendations to political decision-makers and have launched their own service innovation projects (so-called pioneer activities).

During the government of the German Federal Chancellor Angela Merkel, the idea of a stronger integration of the different actors and political levels with regard to the innovation system has been continued. For this purpose a "Council for growth and innovation" with most prominent representatives from politics, science, and the economy has been established. This „Rat für Wachstum und Innovation“ supports and gives advice to the Federal government with regard to innovation policy issues. The "Council for growth and innovation" is accompanied by the "Research union economy-science". This circle „Forschungsunion Wirtschaft-Wissenschaft“ is a further consulting committee with prominent members. It deals with the implementation of the German high tech strategy. To both committees there are subgroups which look into service innovation issues.

How do policy actors address service related innovations on a Federal level?

Structure of the German Research System

The German research landscape is highly diverse and complex in structure (see Figure Appendix). For example, public-sector institutions are financed both by the state and by industry, while private research also receives state support. The Federal Republic of Germany's federal system enables both the Federal Government and the governments, the socalled Länder, to fund and promote German research in their respective spheres of responsibility, without having to issue special research-support laws for this purpose. Art. 91 b of the Constitution obliges, the the Federal Goernement and the Länder to cooperate in supporting scientific research institutions and projects of supra-regional importance. This is in line with the Federal Government's and the Lander governments' joint responsibility for research, which in many cases calls for coordinated action in the interest of the nation as a whole. Many of the key players in Germany's research landscape - such as the Deutsche Forschungsgemeinschaft (DFG), the Centres of the Hermann von Helmholtz Association (HGF), the Max Planck Society (MPG), the Fraunhofer-Gesellschaft (FhG) and the Science Council (Wissenschaftsrat), which has been established by the Federal Government and the Lander - are jointly funded by the Federal Government and the Lander governments. Despite varying regional interests, Germany has created a research and innovation system, via co-operation between the Federal Government and the Lander governments, that is effective and efficient - also from an overall national perspective (BMBF 2004).

In Germany there are several ministries with different priorities in charge of promoting "services". To get a short overview, we will simplify at this point the responsibilities of the ministries: The German Federal Ministry of Education and Research is in charge of service research, the German Ministry of Economics and Technology is roughly spoken responsible of innovation and development of in different sectors of the economy, including the service sector, and the German Ministry of Labour is in charge of all aspects of labour and working conditions in regard to services. As the borders of research, development and innovation are sweeping the need of coordination is high. Furthermore due to the sweeping borders and viewed by an external perspective, it is evident that in some cases, research is funded as innovation and innovation is funded as research or development.

The main drivers of publicly funded service research in Germany have been the Federal Ministry for Education and Research and the corresponding project management agency “Arbeitsgestaltung und Dienstleistungen“ (i.e. “Development of Work and Services“). They have started their activities in the mid 1990s under the umbrella “Services for the 21st Century”. Until then, there has been no funded institutional service research (e.g. service research centres and university chairs[1]) and only a very few service research projects - mainly in the context of human resource management and quality management - in Germany (BMBF 2006a).

Federal Ministry for Education and Research

Public funded service research in Germany has a relatively short history. In the early nineties of the past century it became evident that although the economic significance of the service sector increased, this was not reflected in the structures of research policy. On this background, the conviction matured among the actors from research policy that it was necessary to pave the way towards an independent research programme on the subject of services.

Phase I (1995-1996): Expert study “DL2000plus”

The intensity of work in this field was only significantly stepped up, however, in connection with the expert study “DL2000plus” funded by the German Federal Ministry of Education and Research. This initiative, co-ordinated by the Fraunhofer Institute for Industrial Engineering, provided a strong boost for the establishment of service research in Germany. More than 300 experts representing business, politics and academia participated in this assessment of the current situation, which was followed by a broad discussion to define those areas of Germany's service sector in which research and further action are required.

Phase II (1997-1998): Priority Measures

In the following years, the German Federal Ministry of Education and Research launched a series of major initiative projects, referred to as “Prioritäre Erstmaßnahmen” (i.e. priority measures), focusing on particularly urgent research topics. The 13 measures of high priority have been structured along the following four research areas (Bullinger 1998):

[1] The first German university chair on service management (Professor Stauss) was established at the Catholic University Eichstätt-Ingolstadt in 1997.

- Basic research:
  - trends in services
  - service headquarter Germany

- New markets and intelligent products:
  - innovation management and quality
  - service engineering
  - trade, distribution, leisure and consumption
  - environmental services
  - media services

- Creative organisations:
  - new enterprise models
  - learning organisations

- Selected service sectors:
  - public services
  - communication and financial services
  - social and health services
  - education and qualification services

Some 320 organisations from the business, public and research sectors participated in this phase of the programme. The 113 specific projects ran for approximately 1½ years, involving funding by the Federal Ministry of Education and Research and the Federal Ministry of Labour with a total expenditure of € 20 million (DLR 2004).

Phase III (1998-2005): Programme "Innovative Services"

In 1998, Germany's Federal Ministry of Education and Research (BMBF) responded to the perceived lack of service mentality among the country's businesses and research organisations by launching its first service research programme, thus laying a vital foundation for the comprehensive development of services in Germany. The initiative's key instrument involves promoting ideas, concepts, strategies and models designed to add the necessary new impetus to the successful, stable realisation of the country's potential as a location both for living and for doing business, at the same time securing employment. The overall objectives were (DLR 2004, BMBF 1998):

- to support development of the service sector,
- to encourage a more positive attitude towards research and development,
- to provide incentives to private initiative,
- to draw attention to the consequences for training and recognised qualifications and support appropriate,
- implementation strategies, and

– to promote networking with other economic sectors of the economy.

The following table gives on overview about the funded research areas and the corresponding funding volumes.

Programme »Innovative Services«		
	Duration	*Funding volume*
Benchmarking in order to strengthen innovation, growth and employment in the services sector	1998-2004	€ 8.54 million
Work organisation, management and tertiarisation	1998-2004	€ 24.75 million
Service engineering and service design	1999-2005	€ 16.11 million
Standardisation and quality in the services sector	1998-2004	€ 4.40 million
Stimulation of development of innovative services in the crafts/trades sector	1999-2000	€ 2.81 million
Service co-operation in the crafts/trades sector	2001-2003	€ 3.00 million
Knowledge-intensive services	2000-2006	€ 34.60 million

Source: BMBF 2004, BMBF 2005

The latest outcomes of the funded projects can be monitored on the "DL2100" internet platform run by the Fraunhofer Institute for Industrial Engineering (www.dl2100.de). Over 4,000 registered users keep are informing about their findings. At present some 400 current research projects relating to services are presenting their research results.

Phase IV (since 2006): Programme "Innovation with Services"

In March 2006[2], the new service research programme "Innovation with services" was launched by the Federal Ministry of Education and Research. It has a budget of € 70 million and a planned duration of 5 years (BMBF 2006b).

The main topics of the programme are (BMBF 2006b):

– Innovation management for services
(development of methods and tools, technology design for successful service innovations)

– Innovation in growth sectors of the German economy
(business services, services for elderly people)

– Human resource management in service companies
(work design, "Dienstleistungsfacharbeit", i.e. skilled service work)

A special focus of the programme are transfer activities. One important goal of the programme is to implement the research finding into practice. Moreover, the programme is designed as a "learning programme", i.e. upcoming calls for proposals will reflect the results of current projects as well as general trends in the service sector.

Other funding activities

Research projects funded by the German government are listed in a special online database of the Federal Ministry for Education and Research. A query on "Dienstleistung" (i.e. service) has delivered 784 different projects since 1990 (BMBF 2006a). An analysis of this data has shown that funded service research projects can be found within a broad range of different research programmes. But besides the activities of the initiative "Services for the 21st Century" there is only a significant number of service-related projects in the manufacturing research programmes and the IT research programmes.[3] According to the Report of the Federal Government on Research 2004 (BMBF 2004), there is a overall share of total spending for services-related

2 Although the programme was officially launched in March 2006, there was a pre-programme phase with two funding activities: "Export and internationalisation of services "(66 single projects, funding volume of €20.0 million) and "Integration of production and services "(85 single projects, funding volume of €19.17 million on part of the project management agency "Development of Work and Services "). The latter was the first common activity of the project management agency "Development of Work and Services "and the project management agency "Production and Manufacturing Technologies ."

3 Detailed data about the share of business-related services within these programmes is not available.

R&D of 15 percent.

Federal Ministry of Economics and Technology (BMWi)

The German Federal Ministry of Economics and Technology (BMWi) (http://www.bmwi.de) has the fundamental task of promoting growth and employment . There is no industry-specific promotion approach and therefore generally all industries are eligible for promotion. The activities of the BMWi relating to services are not embedded in one central division, but the organisational units in the Ministry reflecting various service industries (crafts, trade, tourism, liberal professions, media, energy, etc.) or the corresponding associations. These are complemented by the functions of the Transportation, Health and other departments. The BMWi is in charge of the exportability of German services and has initiated political activities in this area together with the Foreign Trade Chambers. They are considering a high need for research with respect to the organisation of the enterprises and the qualification of the employees.

Research promotion is instituted at the BMWi in various contexts. Within technology programmes, innovations are encouraged along three different funding lines (BMWi, 2001):

- »Innovation«
- »Research cooperation«
- »Technological consulting«

Within the funding line of »Innovation« , the BMWi supports young technology businesses in the development of new products, processes and also services. Instruments of this funding line are the programmes »Equity Capital for Small Technology-Based Firms« (BTU), the »ERP Innovation Programme«, the »Programme for the Promotion of Research, Development, and Innovation in SMEs« (KMU) and external industrial research facilities. It should be noted that service enterprises are generally not eligible for promotion in the last-mentioned programme.

With the funding line of »Research cooperation«, the BMWi supports joint research projects of medium-sized enterprises and research institutes. Funding takes place within the following programmes: »PRO INNO« (promotion of the innovative competence of medium-sized enterprises), »IGF« (joint industrial research of medium-sized enterprises), »ZUTECH« (future technologies for small and medium-sized enterprises) and »INNONET« (promotion of innovative networks). Apart from industrial

enterprises and research institutes, innovative service enterprises are particularly supported within the PRO INNO programme.

The funding line of »Technological consulting« is intended to encourage the transfer of knowledge in medium-sized enterprises. In this area, predominantly craft-specific subjects are at the focus. In this regard, inter-company vocational education and technology transfer centres have been established all over Germany. Furthermore, there are specific consulting initiatives in the East German states and, in addition, in growth markets abroad, e.g. in Eastern Europe. Contact points for the initiation and realisation of transnational R&D cooperations have been established there.

In addition to these funding lines, the BMWi also focuses on fostering the application of information and communication technologies. For example, projects of applied research and pilot projects are funded on the subjects of »Electronic Business and Legal Processes in Public and Private Services«, »Telecooperation and Telework«, »Security and Convenience in Online Services«, etc. The intention is to encourage the creation of jobs by copycat effects from best-practice examples. Research topics are not at the core of the promotion activity. Projects have been funded in this area with about 70 million € since 1999.

Hence, the innovation activities of the BMWi can be described as having a bottom-up rather than a top-down character. This enables the BMWi to respond to the current requirements of the economy in a flexible way. Accordingly, services research is almost never conducted explicitly but always promoted in conjunction with other industries. An explicit promotion strategy for research in the field of services is not discernible.

Another relevant activity of the BMWI in this context is the operation of an Internet platform (www.ixpos.de) on which the complete range of German foreign trade funding is presented in an integral view. This portal guides interested entrepreneurs through the large variety of instruments, services and information offered by the individual governmental and semi-governmental actors. Although the portal does not primarily address service enterprises, specific information and funding offers can meanwhile be found for numerous service industries (logistics/construction/tourism, wholesale and retail trade, financial services and crafts).

Future Policy Measures – The High Tech Strategy for Germany

With the High Tech Strategy for Germany, the German federal government has developed a national strategy across all departments for the first time ever that aims at bringing Germany to the vanguard of the major markets of the future again. The federal government defines objectives for 17 fields with a future significance in which new jobs can be created and prosperity can be achieved in Germany. The High Tech Strategy focuses on areas that are of outstanding national interest and offer economic and scientific potentials. These include, for example, health, security and energy research. The federal government allocates a total of about 15 thousand million Euros for leading-edge technologies and interdisciplinary cross-technology activities until the year 2009 in order to reinforce the innovative strength. In this way, the federal government makes a substantial contribution to achieving the goal of increasing the gross domestic product share of investments into research and development to three percent by the year 2010 as stipulated by the Lisbon target of the EU.

Funding for the High-Tech Strategy 2006-2009 (millions of €)

17 High-tech sectors	**11,490**
Nanotechnologies	640
Biotechnology	430
Microsystems techology	220
Optical technologies	310
Material technologies	420
Space technologies	3,650
Information and communication technologies	1,180
Production technologies	250
Energy technologies	2,000
Enviromental technologies	420
Automative and traffic technologies	770
Aviation and aeronautical technologies	270
Maritime technologies	150
Health research and medical technology	800
Plants	300
Security research	80
Services	**50**

Cross-technology measures [selection]	**2,660**
Bundle the forces of science and industry: Research grants, cluster competition, exchange between science and industry competition, entrepreneurial regions	600
Improve conditions for innovative SMEs: Non-thematic innovation funding for SMEs [i.e. PRO INNO, INNOWATT; INNONET; NEMO]	1,840
Support technology start-ups: High-Tech Gründerfonds seed fund, the EXIST University-Based Start-Ups programme, bestpractice models in non-university research organisations	220
For information: Funding for institutional research joint initiative for research and innovation	14,000

Due to statistical constrains, funding for institutional Research can be broken down by individual high-tech Sector only in a few cases.

Fig: BMBF 2006: High Tech Strategy for Germany, p. 104.

SWOT analysis

Strenghts	Weakness
- **Service engineering and standardisation:** The engineering sciences – as ‚traditional' product developers – have taken up this subjekt. - **Integration of production and services:** Interdisciplinary, application-oriented research initiatives are well-established in key German sectors such as the mechanical engineering and automotive sectors. - **High level of education and training:** High education levels particularly in those fields of employment that require academic training and in tarditional services. - **Well-developed infrastructure:** Examples include mobile telephony, digitisation, cable networks, tarnsport systems. - **Art and culture:** Tradition, vigour and diversity of the European art and cultural scene.	- **Investment in research and development:** R&D expenditure by German service companies falls short of the international average. - **Export:** Only a few companies in Germany operate internationally in important service fields. The German services sector is only slightly geared to export business. - **Regulation:** Regulated, small service markets; after-effects of monopoly structures. - **Underdeveloped research landscape:** Measured in terms of the economic importance of services.
Opportunities	**Threats**
- **New markets:** Knowledge-intensive services will benefit from the EU Services Directive. Moreover, Germany and ist European neighbours are lead markets for services that focus on our ageing populations and changing social structure/consumption patterns. - **Innovation potential of hybrid products:** The manufacturing industry and engineering services have a very good international reputation. Germany's service industry can benefit from this through integrated models („Services made in Germany"). - **New employment opportunities and specialised services:** Services open up new fields of work in many areas, particularly at intermediate education levels.	- **Innovation management in the service sector:** Systematic service development – comparable to product development with all the aspects of research, science and education – exists only in rudimentary form (service engineering). Scientific under pinnings have to be improved. - **Exportability and originality:** Knowledge-intensive services are not yet fit enough for export. Lack of intellectual property rights protection for service innovations. - **Services sciences:** R&D methods that are compatible with services must be developed (including suitable measuring and indicator systems).

Fig: BMBF 2006: High Tech Strategy for Germany, p. 78.

It is remarkable that »services« are explicitly mentioned as one of 17 core future fields of innovation in the High Tech Strategy. The High Tech Strategy of the federal government includes a SWOT analysis for each of the future fields, which is as follows for the field of »services« (see figure).

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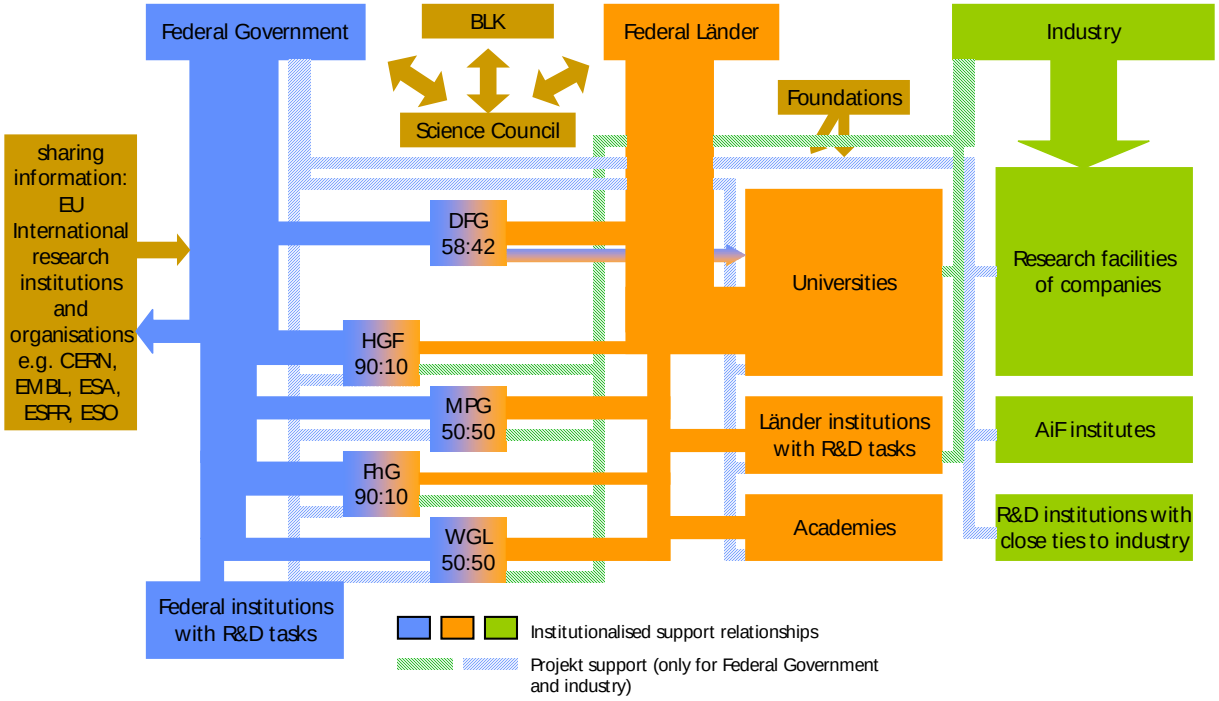
Appendix

Structure of the German research funding sector (simplified overview)



Legend:

DFG: Deutsche Forschungsgemeinschaft (German Research Foundation) www.dfg.de
HGF: Hermann von Helmholtz Association (www.helmholtz.de)
MPG: Max Planck Society (www.mpg.de)
FhG: Fraunhofer-Gesellschaft (www.fraunhofer.de)
WGL: Leibniz Association (www.wgl.de)
BLK: Bund-Länder Commission for Educational Planning and Research Promotion (www.blk-bonn.de)
AiF: German Federation of Industrial Research Associations "Otto von Guericke" (www.aif.de)
Science Council: Wissenschaftsrat www.wissenschaftsrat.de

Fig. Structure of the German research funding sector
(simplified overview, BMBF 2004)