

R&D in Services – 17 Business Case Studies

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European Touch Ltd
Dr. Jari Kuusisto

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1 Introduction

This paper presents the business case studies that were analysed as part of the R&D in services work programme. These case studies are highlighting the real life business practices related to R&D in services in a range of different types of service enterprises. In addition to the specific nature of services related R&D attention will be given to development challenges that analysed businesses have identified. This represents a partial contribution to the work carried out by the CREST R&D in services Working Group. The overall aim of the Working Group is to advance the use of R&D in service sector by exchanging information, identifying good practices and developing policy measures and recommendations. In total 14 countries have participated the R&D in services Working Group, and around 10 countries have been most active contributors to the work programme. The participant countries include: Belgium, Denmark, Finland, Germany, Greece, Iceland, Ireland, Lithuania, Luxembourg, Sweden, Turkey and the United Kingdom. The programme of the CREST Working Group includes the following elements that are reflected in the chapters of this paper:

1. A review of existing literature and databases
2. Survey of policy measures targeting the R&D in services activities in the participating countries
3. Case studies highlighting the practices and development needs of R&D in services in multinational enterprises – a task addressed in this paper
4. Synthesis and policy implications for the promotion of R&D in services.

As a whole this work will bring together latest research findings, business case studies, brief statistical note, review of services R&D policy developments in participating countries and a synthesis as the final part of the report. As indicated in point 3, this paper presents 17 business case studies from 9 different countries, exploring R&D in services. The aim is to improve the understanding of the R&D and innovation in services context across the range of different industries and in different size businesses (see Exhibit 1). A semi structured interview schedule was prepared to guide the interviewing process. The purpose was to allow sufficient context related flexibility while at the same time, it was important to have enough common ground to allow comparisons cross the cases. The interview themes included in the common schedules we the following ones:

1. Description of the case business and the way it has developed over the recent years
2. The nature and organisation of R&D activities in services
3. Description of the R&D process in services from the idea to the market launch, nature of development activities and R&D outcomes,
4. Issues that could improve the R&D in services, existing bottlenecks, and e.g. available public sector measures and needs for any new types of interventions.

For details, see Appendix 1, the interview schedule.

Illustrative case studies serve an important purpose as they are grounding the literature-based concepts presented in the earlier chapters. While cases will provide valuable complementary material for the report they will also offer an effective way to communicate the key features of R&D in services to a wider audience. Finally, they will also demonstrate the heterogeneous nature of services and related R&D. For instance, in relation to sectors, size of the business and drivers of R&D and innovation in services. Each case study will provide an analytical description of service related R&D in examined case business.

Exhibit 1 The details of the case studies on R&D in services

COUNTRY	Name	Industry(ies)	No. of staff
BELGIUM	VADIS	Consulting	15
	Creax	Patent research, idea generation, innovation studies, methodological training, new technical marketing studies, and innovation software	20
	Quality Assistance	Contract Research	91
	Defimedia	e-business, e-marketing, e-learning consultancy	20
	Telemis	Software program for medical image management, and maintenance support	30
DENMARK	BDO ScanRevision	Accountancy and consulting	750
FINLAND	YIT Group	Building systems, construction, services for industry, networks and IT	22000
GERMANY	Claas	Agricultural engines and harvesters	8200
	Deutsche Industrie Wartung	Industrial maintenance and cleaning	12600
	Drees & Sommer	Project management and real estate consulting	850
GREECE	Singular Logic	Software and related services	650
LITHUANIA	Maxima LT	Retail trade	23000
NORWAY	Geelmyuden.Kiese	Strategic Communications Consulting	70
SWEDEN	Ekelöw	InfoSecurity	36
	TFS	Clinical Research	300
TURKEY	IES Education and Information Tech. Inc.	Education solution provision	114
	TURKTRUST Information Security Services Inc.	Electronic certificate service providing and information technologies security	30

Exhibit 1 lists those nine countries that conducted in total 17 case studies that analysed a broad range of businesses as presented in the above table. The sample covers a wide range of different types and sizes of services from construction, to software and consulting, covering technology based (e.g. software) services as well as traditional services (e.g., retail trade).

2 Summaries of case studies on R&D in services

The full case reports are somewhat varied in nature and they extend from 3 pages to 13 pages in length. The following sections will first display summaries of completed case studies as well as some findings based on the semi-structured interviews that were conducted with the business representatives.

2.1 Belgium

The contribution from Belgium comes in the form of five compact case studies presenting businesses ranging from business intelligence, patent research and idea generation, contract research, to e-business, e-marketing and e-learning solutions, to image archiving and communication systems.

2.1.1 Vadis – analytical business intelligence consulting

Vadis was founded in 2004 by the current managing director Thierry Van de Merckt (www.vadis.com). The service offer of the business consists of analytical business intelligence consulting and solution development. Vadis offers complete solutions that allow client businesses to understand their clients better, and to predict their probability to accept a commercial offer, or their probability to carry out activities that pose a risk for the service supplier (such as fraudulent insurance claims, aborting their contract, etc). At present the business employs 15 staff of which 5 are involved in dedicated R&D team, 2 on part-time and 3 on full-time basis. In addition to human resources R&D expenditures include computers, and contract work with universities and professors. The nature of the R&D is characterized by close relationship with business projects, so it is very directly driven by business needs. Most of the time Vadis works closely together with clients marketing and sales departments. Other typical features of R&D include: flat organization, cooperation between university doctors and programmers, algorithms exchange and development in connection with university contacts. R&D plan and objectives are reviewed each months and budget is directly pending on the salary of the engaged people. Typical bottlenecks related to the R&D in services include: finding the people with right skills.

On average Vadis launches new services on the markets every two years time. During the last 12 months period Vadis has been developing a new applications which enables the navigation and presentation of the collaborative business activities around the world. This is enabled by a new graphic clustering algorithm supported by the last R&D project funded by ISRIB, Institute for the encouragement of Scientific Research and Innovation of Brussels. For instance, combining IT skills and mathematics or advanced statistical skills. Regional supports are considered most appropriate as the European projects are seen as too complex for the business to handle.

Typical feature of the Services R&D process project is that it involves good business understanding of the problem that needs to be to solved, good vision on how to solve it and what will be out of reach. In addition, there is a need for excellent project management skills, people management, and the right set of skills. Typical stages in the (software) R&D process include:

- identification of the business opportunity
- specification of the development project
- project planning
- formulation of the R&D budget
- follow-up
- testing, and finally beta test on real problems

The key skills needed in services related R&D process management include vision of the potential outcome, technological skills, and program management capabilities. Our own work as consultants is the most common source for new ideas. R&D outcomes are most of the time gradual improvements, while more drastic changes are typical when the vision emerges from a totally new ground, i.e., from the white page. The external resources that Vadis makes use in its services R&D process include Universities resources and outside researchers who are contracted to do some work. Typical outcomes of the R&D include: new technologies, e.g. software tools enabling new types of services, new type of service offer / service products, as well as entire new types of business models. IP protection is important since competitors seek to imitate new services immediately, and often they also try to hire people from our R&D team. Best ways to protect IP include fast innovation cycle, high enough R&D budget and law suites in case of infringements.

Improving the performance of services related R&D. The main improvements that the current services R&D process could benefit from include short R&D programs after students have first graduated. There people could learn how to perform R&D, and this does not mean a full scale PhD course but a shorter sorter period where people could learn skills relevant for the R&D. Public authorities could promote R&D in services by offering supports for the R&D as the regional agency IRSIB does. They could also facilitate and create synergies between innovative businesses by creating dedicated meeting spaces for them, by promoting interaction and exchanges between innovative businesses more generally, and by offering help to innovative businesses so that they would be better able to export heir knowledge based services.

2.1.2 Creax – Patent research and idea generation

Creax was started in 2000 by the managing director Simon Dewulf and it initially started out as a research programme on ‘how to make engineering education more creative’ (www.creax.com). CREAX analyzed all innovation methodologies (TRIZ, FA, QFD, DFMA) as a starting point of the research, from which it developed its own innovation methodology that is being utilized today as a way to solve problems, generate innovations and to find new markets. Initially the service offer by Creax included patent research, idea generation, innovation studies, methodological training, marketing studies for new technologies, and innovation software. Current offer includes also professional services for all the above-mentioned domains, whereas initially mechanical engineering made about 80% of all the business. Currently services make about 70% of the Creax income, and they ensure a stable income and growth. However, services do not entail similar a leverage effect as manufacturing, as they are linked to the billed hours. At present, the business employs 20 staff of which 16 are involved in the R&D, all of them on full time basis. In addition there are 2 contracted out persons working in the services R&D. Current R&D expenditures

include human resources, patent databases, servers, scientific literature, software, and training related costs.

The nature and organisation of services R&D activities. R&D in services has been organized so that Creax seeks to employ staff with a wide range of knowledge backgrounds so that the problems can be solved utilizing different angles of knowledge, i.e. chemistry, mechanical engineering, etc. The R&D team has a set of objectives and budgeted resources. Typically the objectives are guided by the on-going project work so that the specifications emerge from the research projects. The clients of Creax can benefit from the national and European level public support for R&D and Creax is also assisting them in finding the correct funding mechanism. In addition, Creax runs joint programmes with Universities on building tools for R&D. Creax also develops new services in interaction with the clients with the help of its partners. This means Creax relies on R&D partnerships that are long-term relations in nature. On average, Creax launches new or improved services on the markets every 6 months time. Typical bottlenecks of R&D in services include lack of skilled people and time investments in the R&D tend to take place on cost time available for sales work.

The nature of the services R&D process. The key to success factor in the R&D service itself is the communication, interaction and integration with the partnering companies. This represents the way forward as the company seeks to limit its risk in the Research activities, focusing resources more on the development type activities. Some typical stages in the R&D process can be identified. The first step is from no idea to good ideas: that is the problem definition, patent research, functional analysis, idea generation with the CREAX methodology, evaluation of 150-200 idea concepts, and finally the feasibility analysis of the top 10 selected clients. The second alternative is from good idea directly to cash, which is done within the company itself. The key skills needed in services related R&D include: open mind, understanding of problems, creative skills, good analytical skills, communication skills and 'sharing of imagination'. Typical sources for new ideas includes a database build by Creax on successful innovations [www.moreinspiration.com], and also the function database [<http://function.creax.com>], illustrating the CREAX methodology, as well as a systematic approach to idea generation. In a typical case it takes 7 -12 months to develop a new idea and launch it to the markets. The outcomes of the R&D process are typically both gradual improvements and more fundamental changes to the existing services. Fundamental changes, and more radical innovations in particular, are encouraged in Creax. External resources are used in the R&D process mainly, when the feasibility of an idea is examined, and technology suppliers represent a free resource available for feasibility studies. Typical outcomes of the services R&D in Creax case include new markets, new intellectual property, and eventually new partnerships. Often competitors tend to imitate new services very quickly, but service innovation needs to be seen as a continuous process and the real challenge is to bring new services to market by the time others copy the previous generation. This creates another challenge linked to the return on investment for innovations that have a very short life- time. In other words, how to make enough profit during the short life-time of the innovation. Imitators that offer services linked to database research can be easily identified, however the better way around is to ignore these copies and invest time in New Service Development rather than defending the existing one.

Improving the performance of services related R&D. The existing services R&D process could benefit from 3 key factors that constitute successful innovation, they are creativity (skills), knowledge (schools) and action (processes). In the future computer-aided research will greatly enhance the speed and quality of R&D. Public authorities could promote existing successful models, and to make more funding resources available for them. They could also introduce a step-by-step process offering financial supports all the way from R&D stages to the launch of an innovation. Since R&D is in the core of the European success, we need to plan accordingly. Research in R&D services is therefore a must.

2.1.3 Quality Assistance – contract research

Quality Assistance – contract research business was established in 1982 by two founders Philippe Draux and Philippe De Raeve (www.quality-assistance.com). Initially the service offer of the firm included quality control services for the food, environment and medical sectors. At present the service offer consists of contract research exclusively for pharmaceutical and biopharmaceutical industries, and R&D work on medical products. Services play a key role in the business since Quality Assistance is R&D services provider. Competence, quality assurance, sensitivity and communication are therefore essential elements of the business. At present Quality Assistance employs 91 staff of which 11 are working in the services R&D, all on full time basis. In addition to human resources our R&D expenditures include premises, equipment and consumables necessary for R&D activities.

The nature and organization of services R&D activities. Services related R&D in the firm is based on continuous evaluation of the market needs. What is needed is an identification of a potential innovation. Once this has been achieved, the development process will be started, validated by a scientific committee that authorizes and enables the R&D group to start the development of new services. The company has R&D sections for each type of key activity including: physical chemistry, biology, and bio-analysis. There are established objectives and budgeted resources for the R&D in services, and several highly qualified scientists work full-time on the development of new analytical methods. Quality Assistance has benefited from the regional level public support for services R&D. Public support was granted in the form of a recoverable loan was provided by the regional development agency Research and Technologies in Wallonia (DGTRE) for the development of physicochemical methods for the characterization of biomolecules. In the past, the company has received support for employing personnel necessary for the development of technological innovations. New and improved services that have been launched on the markets during the last 12 months time include the full range of services concerning the analysis and characterization of macromolecules (active ingredients of the new generation of medicinal products i.e. biopharmaceuticals). Overall, new or improved contract R&D services are launched on the markets at any time needed, depending on the evolving market needs. The three main bottle-necks that are typical of R&D in services include: 1. Pressure to cut down development time, 2. Shortage of skilled personnell, and 3. Lack of financial resources

Services R&D process. Our typical services R&D project is based on a pool of competences and structured organization in line with market needs. Typical stages in the R&D process include:

- analysis of market needs,
- decision by Board of Directors
- investment in equipment and training and/or engagement of qualified personnel communication / marketing of new services

Overall, the key skills needed in services R&D are competence in the subject field and ability to be responsive to markets. Universities are most important external R&D resources that we use in your services R&D. Typical sources for new ideas include: clients, analysis of competition, and overall evolution of pharmaceutical products. It can take anything from 6 months to 3 years to develop a new idea and launch it to the markets. R&D outcomes include both gradual improvements and also more fundamental changes to the existing services. Typical outcomes of our services R&D include new laboratory activities required for the pharmaceutical and biopharmaceutical industries (development of new medicinal products). In order to prevent copying of our services we make use of confidentiality agreements with customers and service providers. Also non-divulcation and anti-competition agreements with personnel and external consultants are being used as a way to protect and manage out IP.

Improving the performance of services related R&D. The key element that could improve the current services R&D process is the availability of skilled personnel. Public authorities could also promote R&D in services by improving financial incentives for businesses willing to invest in it. In the future we need to be capable of developing all analytical services complementary to our present activities, enabling us to propose a complete package of services required for the development of a pharmaceutical product.

2.1.4 Defimedia SA - e-business, e-marketing, e-learning consultancy

Defimedia was established in 2006 as a merger of two businesses, Imedia and Definition (www.defimedia.be/). Services have an essential role in the business which consists of the development of multimedia solutions for e-business, e-marketing, and e-learning. At present the business employs 20 staff, of which 4 are involved in services research and development, three as full-time R&D staff, and 1 on part-time basis. In addition to human resources other R&D expenditures include purchase of mobile technologies for testing purposes, for instance i-phones and GPS devices.

The nature and organisation of services R&D. In Defimedia. R&D is almost entirely centered around the applied Atoms framework in JAVA environment. The R&D and evolution needs of this framework are formalized from information coming from:

- customers' needs directly treated by our analysts and project managers;
- consultants' analyses, and;
- technological watch on a permanent basis realized by persons involved in R&D

There is a specialist R&D team of three developers in charge of the framework improvements and they are all senior JAVA developers who have extensive experience in science and research. Defimedia has a yearly R&D budget and it invests around 50% of the profits to in the R&D. In terms of public R&D supports, it has received financial assistance in 2003 to study and verify the technical feasibility of its software framework. The source of this support was the regional development agency Research and Technologies in Wallonia (DGTRE). As a result of the active development work new or improved services that have been introduced during the last 12 months time include:

- PDF Editor/ creator capable of high quality printing, which is expanding Defimedia's applications content on web as well as in PDF
- Development of a data base structure in hybrid XML and relational mode to allow Defimedia's applications to structure heterogeneous data
- Automatic generator of AJAX files to allow Defimedia applications to develop Web solutions in different modes
- E-bay solution integration

The R&D objectives seek to secure that applications developed by the Defimedia allow the flexible development of multi-data, multi-devices, multi-formats oriented solutions. These innovation's time-to-markets is typical of software product cycle and Defimedia launches new or improved services every 3 months period, and major releases every 6 months period. Typical bottlenecks of the R&D in services include difficulties in finding the skilled workers who have competency both in combining informatics and some field of science. Since Defimedia's framework is in use in the customer businesses, innovations need to be introduced on a permanent basis but without continuously interrupting their work processes.

Services R&D process in Defimedia can be described through the typical stages of the process that include:

- Technological watch to identify technological fields with interesting future, and possibly as an emerging standard
- Discussions with partner organisations including universities
- Identification of customer needs or innovative ideas
- Decision to invest in a prototype
- Analysis and decision to incorporate the evolution into AToms framework

The key skills needed in services related R&D include people with:

- Scientific mind and curiosity, capacity to critically analyze market information, competency to elaborate feasible working plan, willingness to find a well performing and durable solution.
- Consultants capable of anticipating customers' needs and trend

Typical sources for new ideas include customers as well as university and industrial partners, and it normally takes 6 months to develop a new idea and launch it to the markets. R&D outcomes include gradual improvements as well as more fundamental changes to the existing services. Continuous minor improvements are necessary so that we can keep up to with the competition as more radical evolutions normally bring specific new features and value added to our solution. Defimedia does not use external R&D sources but it has permanent contacts with: academics at the universities, technical partners and customers. IP management in Defimedia is not

currently using any protection tools since the software solution is available as open source which means that the business needs to innovate continuously.

The main improvements that the current services R&D process could benefit from include more frequent contacts with:

- University partners with interest in our activity fields: such as multi-modal interfaces. Defimedia is trying to maintain contacts with some of the leading professors from the best universities. These are providing access to more extended network of experts.
- Industrial partners with a view on the market evolution. For instance, Defimedia is developing a relationship with SUN Microsystems.

In addition to the closer interaction with academic institutions and clients the future development needs include a number of new technological developments that will be needed.

2.1.5 Telemis SA - Picture Archiving & Communication System

Telemis was established in 1999 by four founding partners as a business offering installation services for Picture Archiving & Communication Systems (P.A.C.S.) which is a software program for medical image management (www.telemis.com). Originally Telemis is a spin-off of the Université catholique de Louvain (UCL) in Belgium from its telecommunication and remote sensing Laboratory. Here the University developed core competencies in image processing, distributed applications and security Infrastructure. The Laboratory became an actor in numerous national and European projects (Fourth European FrameWork), and it also takes part in the development of international norms and standards. As a business Telemis is a global leader in the filmless distribution of medical images. By utilizing the Telemis products and services, images can be shared efficiently and cost effective both within and outside the hospital. Telemis-Medical is a modular and scalable solution that can be integrated into your existing Healthcare Information Systems. It allows the client to start using it without large investments needs. This is possible due to modularity and its client-server approach of the developed software product. Images can be shared inside the hospital (intra-muros) between the imaging departments and other services (ICU, etc.). Telemis-Medical also offers new opportunities for sharing medical imaging devices (extra-muros). This service offer also includes maintenance and support services for this technology. Services play a key role in the business as “High service standards” is an important differentiator and a key aspect of competitiveness for Telemis. At the moment the business is employing round 30 staff of which 5 employees are working in R&D, 3 on full-time basis and 2 on part-time basis. Besides human resources other R&D expenditures include equipment, and software licenses.

The nature and organization of services R&D activities. In terms of R&D organization there is an R&D unit, including one R&D manager, supervising a team of 4 engineers. R&D meetings and updates are organized on a regular basis. Every engineer has his/her personal objectives and on the business level Telemis typically invests 8 to 10 % of its turnover into R&D. In terms of public R&D support, Telemis has drawn an interest bearing loan from the regional agency, Gateway to Research and Technologies in Wallonia (DGTRE). New or improved services that have been

introduced during the last 12 months time include one new version of software each year, plus new products such as mammography imaging software. On average, new or improved services are launched on the markets once or twice per year. At present the typical bottle-neck of R&D in services is availability of skilled personnel.

Services R&D process. Typical stages in the R&D process, include ideas and suggestions from the customers, followed by research including collaboration with university(ies). Sources for new ideas include clients and sales force, in other words customer interface is highly important for the R&D in services. Key skills needed in services related R&D include flexibility combined with the knowledge of the substance area. Depending on the product/service, it takes 12-36 months to develop a new idea and launch it to the markets. The outcomes of services R&D are most often related to enabling technologies and services linked with physical products. Around 90% of the R&D outcomes are gradual improvements rather than radical innovations. External resources used in services R&D include; University labs contacts (regular meetings), and consultants (starting to think about outsourcing some phases e. g. testing). Main improvements that the current services R&D process could benefit from are related to availability of skilled personnel. Services that Telemis offers are highly linked to products the company offers, so IP protection of services is linked to the entire product-service combination. Copyrights are used as a method to prevent copying of services. Concerning the public support, it could best promote R&D in services by offering suitable R&D related training for the personnel.

2.2 Denmark

The Danish case presents the findings from the BDO ScanRevisio Accounting and consulting.

2.2.1 BDO ScanRevisio – Accountancy and consulting

BDO ScanRevision is a knowledge service company whose core business area is accounting services. Other areas of activities include business consulting and service. BDO has 750 employees across 26 offices in Denmark. The company in its present form was created through a merger of 3 regional accounting firms in 1990. 150 out of BDO's 750 employees are involved in R&D, none of whom devote all their time to R&D activities. All of BDO's R&D expenditures consist of wage costs (ie. no R&D expenditures for capital, equipment, software, licenses, etc.). BDO's R&D activities are conducted predominantly in-house, though BDO also commissions external research projects and is involved in R&D collaborations with other firms (both of these are described in greater detail below).

Key findings. None of BDO's development activities are publicly funded. Two members of BDO's management were interviewed the other one being a Knowledge Officer and state authorized accountant who manages the development of accounting techniques and competences. This position is fairly new (created in 2006) and is part of a strategy to increase knowledge transfer and development across the organization. BDO's development activities include both the continual development of accounting methods and practices and the development of new business services. In addition, BDO conducts a number of activities within human resource (HR) development. It does not have a separate department that carries out R&D activities, though it does

have specific units that manage these activities (see below). BDO sets a budget for its HR development activities. For its other development activities, specific objectives and budgets are set on a project basis.

R&D activities are very project oriented, either within or across departments, or with external researchers. A think tank, BDO Innovator, was created in order to promote the discussion and generation of new ideas, new service products, competences or business models by firm partners. If an idea or proposal is accepted, a project is established for its development and implementation. Many of these innovation projects can perhaps be best described in terms of the development of new skills or competences as opposed to new products. There is emphasis in the idea generation phase on creating completely new products or competences ('blue ocean'), drawing on mega trends and research into customers' latent or potential needs. Central factors needed for these innovation projects include employee skills and competences, but also essential is the design of the innovation process and ways of thinking. Open mindedness, questioning and curiosity are considered essential, as are the merging of different ideas, expertise and backgrounds.

An example of a recent new product is "family economic coaching" which provides personal financial consulting to the management or owners of businesses themselves (where the business may already be clients of BDO). BDO provides advice on financial planning in order to achieve customers' personal (private) objectives for the future. The product thus builds both on BDO's core competences and on research on social and consumer trends. Another example is a project as part of BDO's human resource development involving collaboration with public research. BDO works with university researchers within anthropology and philosophy along with other project participants to investigate and identify the deeper, latent determinants of the importance and meaning of work for individuals. BDO also has had an 'incubator' for developing leadership skills and competences of managers. This incubator is now being expanded to encompass all employees. A three year development plan is being formed for all employees which includes a 7 day course that focuses both on personal and professional development. The development of accounting methods and practices is managed by a three person committee led by the knowledge officer. Development work here consists of continual development of standards and guidelines, development of new products and processes and involvement in larger collaborative projects. As part of the continual improvement of accounting methods, the committee identifies topics or issues that are then investigated in detail by firm employees. A written report is produced on the issues, which then forms the basis for any changes in current accounting practices. As part of these activities, BDO follows closely discussion on accounting rules and guidelines, are participates actively in their development.

BDO's accounting system and methods are extremely important for its business, and a key focus of its development activities is on advancing this system. Based in part on its accounting system, BDO has been commissioned by the Danish government (Danish Commerce and Companies Agency, Erhvervs- og Selskabsstyrelsen) to develop an electronic reporting system, XBRL, in cooperation with IT specialists. As an accounting firm, BDO's business is substantially influenced by accounting rules, laws and regulations, both in Denmark and internationally. However, rules and regulations were not cited as an important obstacle to BDO's development activities,

nor was operating in a small economy such as Denmark. BDO does not utilize any intellectual property rights to protect its service products from imitation, nor is imitation by other companies an issue that influences their development activities. A main rationale behind this is that BDO's services are closely connected to employee competences and their business as a whole, neither of which are easily copied. BDO collaborates with other accounting firms, in particular smaller companies in specialized areas. This facilitates the transfer of specialized knowledge and in some cases leads to the purchase of smaller, more specialized firms.

In terms of public policy to promote service innovation, collaboration with public research was identified as a target area. Policy can do much to increase the types of collaborative relationships that can be formed and ease their establishment. BDO has entered into a number of relationships with public research institutions, including sponsoring a professorship, contracting external research and participating in larger collaborative projects. BDO has experience improvements in recent years in the ease of establishing cross-disciplinary cooperation with public researchers, in particular within Humanities. BDO has however experienced less interest in collaboration from public researchers within accounting. In addition to reducing barriers to industry-science relations, BDO also cited the need for improving researchers' incentives for cooperating with businesses, for example by giving cooperation with businesses greater weight relative to academic publishing.

2.3 Finland

The Finnish case deals with industrial services in the case of YIT group that is operating in the construction industry and industrial maintenance services.

2.3.1 YIT Group

YIT Group's business mission is to build, develop and maintain a good living environment for people. It offers technical infrastructure investment and upkeep services for the property and construction sector, industry and telecommunications. In all sectors of operations, the YIT Group's services cover the entire life cycle of projects. The main market areas are the Nordic countries, the Baltic states and Russia. The operations are divided into three business segments: Building Systems, Construction Services and Industrial and Network Services. In 2006, the YIT Group had revenue of EUR 3.3 billion and operating profit of EUR 259 million. YIT has over 22,000 employees in eight countries. This case mainly concerns the Building Systems Division which represents one of the three main business areas of the YIT group. The business of the Building Systems Division can be divided into the areas that include: technical solutions, technical property maintenance and servicing, and facility management. At the moment services make up around 40% of the turnover and they represent a growing business activity. In total Building Systems employs 12,000 staff.

Key findings. Building Systems employs around 20 full time R&D staff whereas the number of part time staff reaches 1000 persons conducting R&D as part of their daily work. The number of contracted external R&D staff is rather insignificant. Besides human resources YIT invest into existing commercialised technologies that enable new services, for instance mobile handhelds that can support the work of the field

service personnel. Such devices can transmit to the service staff detailed info on the next service assignment and hence optimise their workload. Internal service process development projects are the other main types of investment into the services R&D. On a yearly basis such projects represent investments that can vary between few hundred thousand Euros to several millions pending on the situation. As such there is no separate R&D budget since services R&D is based on the development projects that are a tool for achieving the given strategic targets. Hence, all the development projects are closely related to strategic priorities even if they may concern very practical issues within the business units that are located in Nordic- and Baltic countries and in Russia. Typically the headquarters defines, and to some extent carries out, strategic level service development.

- Framework programmes that are based on larger socio-economic trends run 5-10 years
- Projects that convey the Framework ideas into more practical actions running 1 -5 years
- Concrete development projects last 6-12 months
- Incremental development steps are more reactive based on client feed back

Once the idea has been developed centrally, business units in different countries apply the new concept into the local environment, closely liaising with the client interface. Overall the R&D in services involves two main processes. Large strategic lines are set on the group and division levels, whereas the applications are developed in the customer interface in close liaison with the clientele. At the Group level YIT has close links with Tekes but Divisions like Building System are not much involved in publicly funded projects. The services development is carried out internally and it is very much a bottom up process. Suitable public funding tools for services development are still only starting to develop. On a strategic level service development projects are related to a certain socio economic trends such as energy and environment, demographic change, digitalisation of technologies etc. For instance, consumers are becoming more likely to buy external services as they increasingly appreciate their leisure time, they like to invest more in life-style related issues in housing. At the same time consumers are becoming less capable of carrying out house related maintenance tasks, partly because housing related technology is becoming ever more complex. Finally, digital distant monitoring enables new types of services, for instance those related to home security.

The most important service R&D related bottle-necks are related to the existing rigid structures on the markets. The construction industry's market place is dominated by a small number of large firms and numerous small businesses, such as plumbers and electricians who seldom have any resources to develop new innovative services. Hence, buyers are mainly giving orders to the lowest bidder and they very seldom buy into a new type of services. This creates a situation where all the service suppliers can benefit when a new service becomes accepted on the markets, hence the need to protect service related IP is not that crucial. Typically, it is easy to copy a service concept but it is much more difficult to copy a culture and entire system which is able to deliver the service in a profitable way. This is because each business has its own strengths and often the new service is based on such strengths.

The buying behaviour that focuses on the selection of lowest price by the time of purchase, means that the selected solutions are typically not offering effective solution through out the life-cycle. They are cost effective only at the moment of purchase when the supplier is selected. Such short-term optimization does not offer an ideal platform for services development and, unfortunately market structure and culture are very difficult to change so that they would be more service friendly.

Typical outcomes of service projects involve existing technology that is applied as an enabler to a new type of service. New types of business concepts are also important outcomes from service development. Since markets are not keen to adopt new types of services public sector should address demand side issues as part of the innovation policy. Also the lack of innovation culture at the industry level could be addressed. Public policy also should identify our national / regional strengths and focus development in those areas, e.g. energy efficient buildings.

As for the R&D and innovation process at the YIT, it could be even more horizontal in nature, seeking to find solutions to clients needs. At the moment it can be too fragmented and discipline oriented, e.g. around electrical development, plumbing development etc. Public procurement could also be an important stimulant for innovation, now it is too much focused on costs and clearly favouring the lowest bidder. The focus should be on life-cycle costs instead. Overall public sector funded development projects are a challenge to large enterprise, we give a lot in them in terms of knowledge but may gain little benefit out of them. Our development aim at producing sustainable competitive advantage for us, and this is not obvious in the case of publicly funded projects. Often public R&D projects have a tendency to level businesses capabilities (spill-over). Instead these projects ought to facilitate differentiation through businesses capabilities development.

2.4 Germany

2.4.1 CLAAS - agricultural engines and harvesters

CLAAS is one of the leading manufacturers of agricultural engines and harvesters worldwide. The business was established in 1913 and employs now 8.200 people worldwide. In 2006 the sales amounted to € 2.351 million. The company's income before taxes is listed with € 130,7 million. Its R&D expenses amount roughly to € 100 million. The company's headquarters are located in Harsewinkel, which serves at the same time as its biggest manufacturing base. CLAAS has a significant portfolio of services that make up about 25 per cent of its turnover. Although the management realises the significance of services and therefore supports the development of new services, the company is still focused to a great extent on goods production. The services CLAAS offers are mainly technically based, product related services. The service portfolio consists of the following three categories:

- Services concerning productivity:
 - Services supporting customers in doing their work in a more efficient way (e.g. through optimized machine usage)
- Telematic based services:

- Services mostly based on GPS (Global Positioning System) and Internet to support maintenance, leasing, and logistics
- Other product related services:
 - Financing, services dealing with replacement parts etc.

Organisation of R&D in Services. The organisation of services research and development is centred around a department called “System based Services”, which consists of four people strong team. This team is supported by a number of experts representing other functional areas. These experts are loosely coupled to the core innovation team. Therefore, the internal organisation of services seems relatively less centralized and highly network based. All in all there are about 20 people involved in the development of new services, some of them on part-time basis. The available R&D resources mostly come from public funded research projects that CLAAS supports with an own contribution of around 60 per cent. CLAAS participates in public funded research activities of both the Federal Ministry for Education and Research in Germany (BMBF) and the Federal Ministry for Economics and Technology (BMWi). The internal research projects are marked by R&D contracts and by well-defined research objectives. At present, CLAAS is running four on-going public research projects. Concerning the bottlenecks, organisational and cultural problems are the ones most commonly mentioned in the case of R&D in services. Both the company organisation as well as the culture for innovations are to a great extent still manufacturing oriented. The employees’ thinking is still highly defined by the manufactured engines and hardware components. As a result, time to markets can be too long to fully support new services and their value creation potential. Also skills-related problems are known to slow down the R&D and innovation processes. There is extensive demand for employees that have deep understanding of technology-based services and who are at the same time able to understand their customers’ business processes.

The R&D process in services. Whereas CLAAS has established an R&D process for product development, there hasn’t been one developed for services yet. The development of new services is mainly based on the ideal service engineering process. However, the development of services often depends highly on market needs which makes accurate planning of the processes rather difficult. The R&D cycle times range from 24 to 36 months which makes them comparable to product development cycles. Apart from incremental improvements CLAAS also develops fundamental new services, particularly services that can improve customers’ productivity. The development of services is strongly based on the use of external resources. Apart from public research institutes clients and companies positioned along the whole value chain get included into research activities. In the areas of specifications of sectoral standards and interfaces there is also cooperation with competitors. CLAAS has its own patent department and in the case of services they also try to protect intellectual property rights through patenting and standardization.

Improving the performance of services related to R&D. The central challenge can be seen in transforming the entire company into a service-orientated organization. Public authorities could support this process in many ways:

- Academia, vocational and advanced training could provide stronger support for the understanding of hybrid products and the creation of value through services

- Public Research Programmes could more suitable for structural and procedural organizational development, for instance, in the areas of Service Life Cycle Management, pricing models etc.
- Often there is no clear-cut distinction between services that are adding value and those which are not (e.g. guarantees).
- New technologies (e.g. web services, robotics etc.) will have a great impact on evolving new services, and therefore they should gain much more attention in the public research agenda in the future.

2.4.2 Deutsche Industrie Wartung (DIW)

Deutsche Industrie Wartung AG is a fully owned subsidiary of the Voith Group. Voith is an innovation oriented business group, which basically operates in machine building and plant engineering. Voith is quoted on the stock markets, but the majority of the shareholding is within the owner family. The group has some 34.085 employees worldwide. DIW was founded in 1963 and has from the beginning specialised in industrial maintenance and cleaning services. Especially in the automotive industry, DIW grew strongly during the 1970s and 1980s. In the mid 1980s, the company was bought by Voith. Today, DIW has around 12.600 employees worldwide. The Headquarters are located in Stuttgart, Germany. Altogether, the cost pressure in the field of industrial maintenance services has increased considerably in the last years. Therefore it is increasingly important for DIW to make their services more attractive by offering extended and highly specialized services.

In its service portfolio, the technical services of the Voith Group focus on two areas:

- Process Services: e.g. for chemical and automotive industries. These services are to some extent very skill intensive and require special know-how about plants and machinery
- Facility Services: In this field the close contact to the customers is an important dimension of success

DIW offer covers the entire field of Facility management Services and it performs the following services:

- Cleaning of production shop floors and industry buildings;
- Special cleaning, e.g. carbon dioxide cleaning in the automotive industry;
- Simple maintenance services e.g. filter change, operating liquids.

Innovations are mostly related to special cleaning, since these services are relatively complex in nature.

Organisation of R&D in Services. The systematic attention to the R&D and innovation in services is rather new at DIW, although the new management has supported these ideas. Nevertheless, until today DIW has participated only in one publicly funded research project: The funds were provided by the Federal Ministry of Education and Research (BMBF), this project is on-going. The development of new services, e.g. a more efficient cleaning procedure, is quite an evolutionary process at DIW. There is a core team of three experts working for the department "Engineering and Quality Management", who are mainly engaged in the development and testing of new solutions. These persons get always involved when a particular customer requires a new solution. Thus, every innovation process at DIW always refers to a specific

customer order or a project. DIW has an existing network of experts with specific knowledge dispersed in the company. These experts are included in the innovation process if their specific knowledge is required. R&D is therefore strongly network based and there are only a few formal structures in place. Although there are some financial resources to support innovation activities there is no real R&D budget available.

R&D Process in services. Over the last 12 months time, DIW has a defined product development process. This process is also applied to new services that are being developed. However, the services development is often involving incremental changes, which are quite easy to describe and to plan. The number of new services is difficult to estimate, although approximately per month, an innovative customer solution is developed. However, innovations at DIW are often not that directly visible (e.g. a new definition of a maintenance contract sometimes can be perceived as an innovation). The lack of time and personnel resources is often mentioned as a bottleneck of the R&D and innovation process. The profit centre structure can also impede innovations, since investments in innovations always have to be considered as costs. An important point is the integration of customers and other partners in the development of new services and service related products. Especially equipment manufacturers and suppliers become included. The protection of intellectual property hardly plays a role for DIW.

Improving the performance of R&D in services. The following topics were brought up as possible ways for the public authorities to improve innovations and research in the area of services:

- The long-term planning horizons of public research projects often differ from the development cycle of dynamic service companies. It is often impossible for service companies to stick with a certain research question over several years period.
- The rigid tracking of research questions as described in the project proposal can be counterproductive if basic conditions change or new problems appear during the project.
- The administrative efforts involved in the public funded projects may overstrain the capacities of small and medium sized businesses (SMEs).

In addition to above, DIW considers how Web 2.0 techniques could be used to support the internal innovation processes. This also affects the question how the widespread competencies and qualifications of the company's employees can be involved in the innovation process in a more optimized way. However, due to a lack of time resources DIW currently goes no further into this question.

2.4.3 Drees & Sommer

Drees and Sommer AG (D&S) is one of the leading German consulting and project management businesses offering services for the building and the real estate industries. D&S acts as a consultant planning and building projects contractor for large businesses as well as for private and public sector investors. *Real Estate and Building Construction services* cover the entire range of management and consulting for the construction of new buildings and modernization of old buildings of all types. Customers include the public sector - federal, state and local authorities - as well as

companies from all industries and the entire real-estate industry. *Services for Infrastructure, Environment and Transportation* cover the entire spectrum of management and consulting in these areas. Customers are primarily public sector - federal, state and local authorities, utilities, Deutsche Bahn AG (German Rail), and airports - but also include private companies in the areas of supply and disposal technology. D&S was first established in 1970 and it employs around 850 people worldwide. Group turnover in 2006 amounts to € 109,7 million. Overseas regional offices are located in 12 countries: Italy, Luxemburg, Austria, Turkey, Bulgaria, Romania, Russia, United Arab Emirates, Qatar, China and Vietnam. Active and former partners are the main shareholders of the business. Hence, shares remain within the pool of partners ensuring that the company remains independent of third parties. D&S's headquarters are located in Stuttgart, Germany. However, the organizational structure is highly decentralized. Therefore, there are many German and foreign subsidiaries that are being led as an independent profit centers. Service Portfolio of the D&S includes highly specialized consulting services for the building and real estate industry. The services consist of the following points:

- Due Diligence Analysis
- Production Site Analysis
- Development Management
- Construction Management
- Facility Management
- Project Management and Contract execution
- Project Development and Financing

D&S provides a variety of purpose designed software solutions that support the particular aspects of consulting services that are most important for the competitive advantage. Usually services are provided locally and characterized by close customer interaction. A special challenge D&S has to face is that the most important growth markets are located abroad. Another one is the fact that the building and real estate industry is influenced by strong nationally and culturally determined characteristics. Therefore the offered services have to be continuously adapted to foreign markets and mentalities. Moreover, the organizational structures and processes have to be adapted to the needs of an ongoing internationalization process.

Organisation of Services Research Activities. D&S provides neither specific R&D structures nor an own R&D department. However, there exists something similar to an institutionalized innovation process. For this reason there are creative "Think tanks" that deal with questions and problems which may become relevant in the future (e.g. requirements of a future project management). These Think tanks usually consist of experienced employees from the important line functions in the company. Future concepts and possible solutions are being worked out in the context of workshops. Although the people involved are aware of these workshops taking place there exist no formal structures to support this process. Furthermore, D&S is involved in some applied research activities organized by the Fraunhofer-Society. These activities mostly aim to focus on new developments and technologies in the building and real estate industry. These activities are organized as innovation circles that include competitors and connected companies alongside the whole value chain. This kind of research is usually not financed by public funds, but by D&S itself. So

far D&S has participated only in one public funded service research project. This project deals with issues of the internationalization of services and it is on going.

Services R&D Process and IPR issues. D&S doesn't talk about R&D internally, but prefers the terms "development" and "improvement" of business activities and business performance. Although there is no fixed internal research budget available people spend working time on innovation activities which is probably their most important resource. All in all, changes and new developments in the company are strongly dependent on certain individuals. Typically development projects are promoted by an employee who has experience in leadership and strong established customer contacts. Furthermore, a member of the executive board is always included into important decisions. As a result, it is not surprising that the temporary availability of these people is referred as the central bottleneck during innovation processes. Concerning the self-developed software, patenting is used to protect Intellectual Property Rights (IPR). Other processes or services are not being protected systematically.

Improving the performance of services related to R&D. Public institutions could contribute to the improvement innovation activities by taking the following measures:

- Public research programmes should have stronger focus on the practical business needs especially those typical of small and medium sized service companies. In many cases, the research questions of the programmes place too much emphasis on the scientific point of view.
- The ability to adapt research questions and research process during on going research projects is of great importance for D&S. Since D&S always connect innovations with real businesses, the specific dynamics of the operational business ought to be considered by formulating long running research proposals.

2.5 Greece

The case study from Greece presents the country's leading software and integrated IT solutions provider.

2.5.1 Singular Logic - Software and related services

SingularLogic was established in 1984 and it is the leading Software and Integrated IT Solutions Group in Greece. It is market leader in the Business Software Services and Business Software Licensing with 29% and 26% market share respectively. The business has reached its current form through a number of mergers and it has been listed on the ATHEX stock markets since 1990s. The Group provides integrated solutions for the private and public sectors, in Greece and abroad, mainly in the Balkan area (Bulgaria and Romania). The Company has a large installed base of software and a leading market share in the Top 100 companies and SME segments in Greece. The software portfolio offering covers more than 40 software product solutions in 2006. The group had revenues of around €65Mill. in 2006 and its revenue is expected to exceed €75Mill. in 2007.

The business is divided in three Divisions targeting different market segments and a range of activities. *EnterpriseDIS Division* focuses on design and implementation of

Integrated IT Solutions for large enterprises of the private sector, including distribution and support of well-established international IT products. *Software Division* focuses on the development and distribution of business software applications¹. *Integrator Division* focuses on the design and implementation of Integrated IT Solutions for the public sector organizations. The division also engages in the collation and broadcasting of election results and in European programs.

Summary of the key findings. SingularLogic employs a total of 740 skilled professionals, of which 300 are certified IT consultants and 140 are top class developers, overall 60 staff are working in the R&D tasks. There is about 23 full time R&D staff, while 20 persons are working on part-time basis and another 20 external persons are contracted from the universities and research institutions. Besides personnel related costs R&D investments include software licensing and equipments. R&D is carried out within the R&D department in cooperation with the department in charge of software project management. Hence, the R&D has a close linkage to customer interface. R&D function has a designated budget and external funding is obtained from the national and EU sources, e.g., IST and Leonardo programmes.

Typical outcomes of the R&D process are incremental improvements. The cycle of new product/service launch depends on the client group and the applied marketing approach. Project lead time varies between 4 months to 3 years. Often new markets launches take place on once a year basis. Typical outcomes of the R&D process are related to service delivery process, enabling technologies, service delivery channel or the entire business model. The bottle-necks of the R&D are often related to the cyclical nature of the business and survival of the projects & funding through difficult times. It is so easy to save costs by cutting the R&D budget. Availability of skilled staff is another potential bottle-neck for the R&D. The R&D process itself could also be more organised and it could benefit from closer links to the business community. Essentially this could make the process faster which is a crucial element in the software services business. Awareness of the importance of the service R&D should be better within the firms top management and also among the public sector decision makers.

Typically the priorities of the R&D is decided on a yearly basis by the experts who work in the business units. Typically R&D department works in cooperation with the project management and most new ideas for the R&D come from the clients and business partners. Multi-skilled personnel is necessary for the R&D process, e.g. people who have experience in the ICT and marketing.

2.6 Lithuania

2.6.1 Maxima LT – retail trade

Maxima LT is the largest retail trade operator in the Baltic States, and it achieved the turnover of EUR 1.85 billion in 2006. It shows around 21 % growth in turnover from the previous year 2005 and the company forecasts a 20% growth in turnover this year

¹ Enterprise Resource Planning Systems (ERP), Commercial and Financial Applications, Customer Relationship Management and Business Intelligence Systems, Human Resource and Payroll Management Systems, Hotel Management Systems, Retail Systems and petrol station systems.

(2007). Currently the company operates over 370 retail outlets in Lithuania, Latvia, Estonia and Bulgaria. The number of shops by country is as follows: Lithuania – 209, Latvia – 115, Estonia – 39, Bulgaria – 17. All together MAXIMA LT has around 14,500 employees in Lithuania. In other countries MAXIMA LT has some 8,500 employees.

Key findings. MAXIMA is the largest employer in the Baltics and it recognises that its strength are largely based on its employees whose professionalism, loyalty and spirit have played a crucial role when the business has built its position as the leading retailer in the Baltic countries. MAXIMA has set the strategic objective to recruit, train and keep the best employees and to earn their loyalty. On top of that, it seeks to maximise the output by applying as many automated work processes as possible. As part of the business planning MAXIMA stores and shopping centres are positioned at shopping-friendly locations. Issues that are considered in the decision-making include the size of the local populace, the traffic and flow of shoppers, the convenience for shoppers to access the store by private and public transport. The name of the entire chain, MAXIMA is seen as a guarantee for uniform quality and the best prices. In order to take into account the different needs of shoppers, the outlets come in different sizes and different formats including local community stores, stores designed for large city districts or towns with populations of 12,000 – 30,000, and the largest regional and national shopping centres are hypermarkets that offer the most extensive assortment of goods.

Nature and organisation of R&D in services. MAXIMA has no dedicated R&D unit. However, each organisational unit is charged with responsibility to survey trends/novelties in their respective areas and make proposals for improvement projects. Also the organisation improvements are assigned to the managers at all organisational levels. Systematic R&D in services is partly built into the corporate strategy process that utilises the Balanced Scorecard methodology. Gaps between existing situation and strategic objectives are filled in with strategic initiatives/projects. Responsible managers are assigned to implement the projects and budgets are assigned to those projects that are accepted for further development. Although MAXIMA has developed high level of competency in the new shops construction projects, it seeks to continuously improve competencies in managing strategic projects. The company's major challenges are to ensure a critical mass of project-minded people and to manage timely involvement and communication on project activities within the large organisation. The cornerstone of the business is the provision of convenience shopping to customers - through suitable shopping formats and services available within in them. In addition to traditional retailing activities, the service offer includes mobile communications services (through a provider owned by MAXIMA), insurance services, MAXIMA has recently launched the air ticket vouchers service with an airline partner (customers can buy air ticket vouchers at check-out counters in shops). MAXIMA is also testing a new service which allows customers to pay their communication services bills at check-out counters in the retail outlets. The company operates a Customer loyalty card programme that provides its members access - at privileged terms - to services of partner businesses working in pharmacy, petrol and other sectors. Within supermarket and hypermarket formats MAXIMA stores have dedicated space for tenants who provide a wide array of services to shoppers. MAXIMA also has firm plans to continue to add new services to its existing portfolio. In terms of services efficiency, MAXIMA constantly analyses

customer self-service options and invest heavily into supply chain improvements. In terms of public funding EU structural funds are used to support staff competence development in the service organisation.

2.7 Norway

The Norwegian case is an interesting example of the work that is being carried out by Public Relations agencies

2.7.1 Geelmyuden.Kiese (GK) - Strategic Communications Consulting

GK is one of Scandinavia's largest PR firms and it has offices in Stockholm, Oslo and Copenhagen². The client base consists of 300 of Scandinavia's leading enterprises and organizations and GK is providing 'strategic communications consulting' for the clients. The business was founded in Norway in 1989, and it has lived through growth and downsizing, now employing 70 persons, with an 82 mill NOK (10.739 mill Eur.) turnover (2005). As a business GK has moved through different organizational structures; it was established as a partnership of relatively independent consultants, then became a private limited company with external financial owners, and is today again organized as a partnership, but with much more emphasis on developing a cohesive firm. Since the start in 1989 GK has been a myth embraced PR consultancy, due to its phenomenal success. Much of the success can be attributed to the business founder who still is a major figure in the company and bearer of a most provocative pen. The client industries range from Banking and Finance, via Oil and Energy, Health and Pharmaceuticals, Transport and Travel, and fast Moving Consumer Goods, to the Public Sector and NGOs. According to GK their goal is to 'move power and influence in favour of its clients through communication'. The service offer include: communications plans, ongoing advice, research and analysis, PR campaigns, product PR, investor relations, crisis response, media training, lobbying course, graphic services.

Key findings. To a large extent service development are incremental developments of the practice, adjustments that are made in the processes of tailoring the services to a specific client and again turn out to shape future projects. A service, e.g. the creation of a communication plan and the coaching to follow it, has undergone small changes in one project, for example through using and adjusting a tool previously used in a campaign creation and management project, changes that have then been transferred by consultants to other projects as suggestions on how to improve or enhance the practice. These changes have then been applied in new projects, and slowly turned into integrated parts of the service provided – as if they were always there. These developments are hard to point to, both by external and internal spectators, as they exist through the practice, and only materialises in power-point presentations, customer pitches, and project proposals. However, the significant changes can be revealed through comparison of how two seemingly similar assignments performed with a year or two in between are solved.

² GK helps its clients by telling the outside world who they are and what they stand for. Storytellers need to be both creative and strategic. Creativity is essential for the story to receive attention. Strategy is necessary for it to be remembered. GK helps its clients to communicate long term and precisely through a variety of channels to defined target groups. The most important thing is not to speak unless there is something to say

The fundamental understanding and formulation of *GK's value proposition for clients and consultants, including its business model, were developed in close cooperation with a high-profile university academic. Collaboration with research institutions is considered more relevant and less cumbersome the further one get from the actual provision of services, and the more fundamental level the development process represents.* This is not surprising since service providers tend to be even more tied up in everyday business than is the situation in 'ordinary business life' because of their business model and their strong client-first ethos. The basic and fundamental tools and methods of GK are partly codification of the senior consultants' practices, and partly an attempt at deliberate theoretically grounded design. Further development of parts of the framework is often organised as internal projects involving a range of personnel, from juniors to more experienced ones. However, the senior consultants are invariably involved in the final approval of new tools as part of the "official" repertoire. Such development is occurring almost continuously in GK, although in varying intensity. These development activities are performed in close relation to ongoing assignments, although with somewhat less articulated cooperation with the respective clients. The reason for the tight coupling with assignments is that constant testing in real assignments is seen as the best means of quality assurance.

While products and services development and development of tools and processes are important, *organisational development is essential for their ability to organise and deploy their resources effectively*, and thus for their long-term profitability. Robust systems and structures as essential in this sense, including incentive structures for collective rather than individual action and a comprehensively elaborated system for internal career development. In clear recognition of its dependency on simultaneous success in two markets; that of clients and that of personnel, GK has since 2002 had a Learning Promise at the centre of its recruitment procedures, promising to be the place in Scandinavia where employees will learn the most about communication and communication consulting.

IP protection in services context is different. Products and processes in services are tightly connected to the practices by which they are performed, and to the practitioners performing these practices. Thus there are three main streams by which the products and processes developed may leak: First; through the practitioners, that is through employees and partners leaving the company. Second; through clients' use, and third; by third parties, competitors etc. GK is confident that even if their processes, tools and methods can be imitated, the competent use of the tools is much less susceptible to imitation. To a large degree, this also goes with 'defecting practitioners', as its practices are most effectively carried out within the GK's communities-of-practice. The ownership is protected by spreading them with 'the GK signature'. If one can't stop others from using the intellectual property, let's at least make sure everyone knows where it comes from. Clients are actually encouraged to use the models and methods internally, as long as GK is duly credited. 'Nothing could be viewed as a better reference of our skills, than others stealing yesterdays news [the methods and tools of yesterday]'. Here, the business is using lead-time advantage as a way to protect and manage its IP.

R&D investments. It seems to be impossible to trace the financial investments GK makes in R& D. There are three main reasons for this: First; GK does not have a

Research and Development unit. Second; internal development projects are not organised so as to provide such records. Third; there are no internal or external incentives for keeping such records. Nearly all development of products and services is carried out in client projects. If a new tool is developed in a client project and proves to enhance the quality of the service GK provide and then is reused in another client project, this is what manifests that the tool has transferable value

2.8 Sweden

Sweden has conducted two case studies on businesses that are operating in information security services - Ekelöw, and in the field of clinical research, Trial Form Support (TFS).

2.8.1 Trial Form Support (TFS)

Company profile. TFS was established in 1996 by Daniel Spasic after having been working in the clinical contract research field for some years. By recruiting people who shared his core values TFS was rewarded with several major studies by the industry. From its establishment, TFS has grown fast, both in terms of employee, turnover and profit. Today TFS is a full-service clinical research organisation, providing the pharmaceutical, biotechnological, medical device, diagnostic and functional food industries with a wide range of clinical trial services. TFS services cover the whole clinical development programme from early explorative trials to registration trials and post marketing surveillance trials. *Vision/goals and business purpose.* TFS's wants to be recognised by their clients as the "top quality provider of clinical trial services in Europe and by our consultants as an attractive employer". TFS is driven with a set of values; trust, fun accessibility and results.

Reflection and summary of key findings. The case of TFS shows among other things difficulties of differentiating between own research in services and customers' research. TFS is helping customers to do research in drugs which render service. These kinds of projects are carried out in cooperation with customers. Thus, customers' need for research program give direct signals to TFS's own development of services. One could say that for these kinds of customised tailor-made projects there is an ongoing service development guided by customers' needs.

Other key findings:

- Except for market/customer's need, competence and technical improvements are the two most important drivers for initiating research in services.
- The number one resource constraint for service development and new offerings is competence.
- Customers, new technique and laws and regulations are the most important external drivers for service development.
- Works quite informal/unplanned manner in doing research in new services.
- Research in services would be improved if customers had a more long-term view on the customer-supplier relation.

From the interviews, it is quite clear that the main drivers for research in services for TFS are technological advances, specialist competence and customer needs. By

monitoring technological advances and customer needs, and then adding the right competence seems to be the most important factor for generating new service concepts. It seems that TFS may be too small and has limited resources to apply for external research funding. In particular, administrative aspects could be apprehended as too challenging. Neither of the two Swedish companies pointed out that they had any national governmental research funding. One could assume that these firms may have limited competence to apply for external research funding.

2.8.2 Ekelöw InfoSecurity AB (Ekelöw)

Company profile. Ekelöw's business is in risk management, risk analysis and identifying threats to companies day to day business operations. In these areas it proposes preventative measures to its clients and offers information security services that are product independent. The services range from setting security targets (IT-systems) to leasing Security Officers. It also assists companies with issues such as physical security, systems security, crisis management, vulnerability analysis and incident handling. Ekelöw's vision and goals are to achieve an "integration of security processes within customers' business processes and in being the leading experts in Information Security and Business Continuity Management". Currently there are about 50 people working for the company and about 5-6 people are doing research, or exploring new opportunities and service offerings. These people are doing this task part-time. These types of companies can not afford full-time employees in R&D, and having part-time employee ensures also closeness to the markets and hence better insights to customer needs. The main improvements that current research on services in our case could benefit from would first and foremost be:

1. A more clearly stated sponsorship from management.
2. Better market surveys as an input.
3. Finance without losing money from the ordinary business process.

The second point is quite interesting. Even if Ekelöw is operating all the time close to the markets, they still feel that they lack adequate customer information.

Reflection and summary of key findings. The case study shows that Ekelöw perceive research in services as an important task for business success. The company has a budget reserved for research on new services. From the interview it seems that the company develops new services in cumulative way, as a bricklayer place a brick on previous ones. Ekelöw's approach to service development is a quite formal process. A research project is first determined and gets sponsored by the management. Thereafter the other phases of the development process begin. The value of more formal and conscious service development process has also been emphasized in the recent academic literature.

Other key findings

- Competitors quickly copies generated ideas. Therefore, it must be a need for knowledge how to protect new services.
- Research in services is carried out in ad hoc project groups.
- The members in a research project group are consultants working part-time with research/development.

- There is a trade-off in doing research in services and making money with the existing services. The same people are being use for both tasks.
- Maintaining and improving existing services is a more frequent task than innovating new services.
- The resources (money, competence, people etc) used to develop services are mostly internal/in-house.

The interviews show a company which research in services mainly is driven by monitoring customer needs. The customer lens is created not by including customer in service development projects, but rather being close to the market. Skilled and experienced employee with both an instinctive feeling of what will sell (what the general markets needs are) and a profound experience from working with customers seems to be the main drivers for research in services.

2.9 Turkey

Turkey has conducted two case studies on businesses that are operating in information security services - Turktrust, and in the field of education solution services, IES Education and Information Tech Inc.

2.9.1 TURKTRUST (TT) - Information Security Services

Company profile. TURKTRUST (TT) Information Security Services Inc. employs 30 staff and it has 5 full time R&D staff. The company is owned by the Turkish Army Foundation ‘Elele’, and it was established in 2004. The main business areas of TURKTRUST include electronic certificate service and information technologies security. Electronic certificate service providers (ECSPs) have formal legal status, and their work is authorized and subject to audit by Turkish Telecommunications Authority. As an ECSP TURKTRUST services on electronic certificates, time-stamping and other services related to electronic signatures. The main function of a TURKTRUST as an ECSP is to identify a person based on official documents, produce qualified electronic certificate in a secure environment and deliver it to its owner. In other words, the main focus of the firm is providing services related to digital signatures.

Summary of the key findings. TT has established an R&D department focusing on service development the objective is to develop new and value added service products related to digital signature certificates, PKI technologies and IT Security. The R&D budget is shared between finalizing contracted projects and releasing new projects and products. Two of our on-going R&D Projects are being supported by the funds from The Scientific and Technological Research Council of Turkey (TUBITAK). sNew products and services launched within the last 12 moths time include the following. Various PKI and digital signature services and software products like LAREA- OCSP Client software, PALMA-Smart Card Management Software, SPIRA-Time Stamp Client, SPIRA Server-Time Stamp Server Software. On average major new service product launches are being made once or twice a year. Smaller projects and up-dates are introduced 4-5 times a year. Typical bottle necks in services development include:

- Change in requirements,

- Extra assignments,
- Problems in obtaining grants,
- Changes in standards and related laws and legislations

In typical service R&D projects the main challenge is changing peoples approach to the digital signature. This is highly a new concept for many people and public and private institutions. Typical stages of our R&D process include: generation of the idea, development of idea, market search, go-no go decision, service design, production, test and market launch. This is very similar process to the traditional product R&D process. Source of new ideas are typical of service products including: clients, suppliers, market trends, sales force. The key skills required in the R&D process include: talented, trained and dedicated team, team work, system approach, critical decision making. The development cycle for the service is 1-2 months for a middle range project and 5-6 months for larger projects. R&D outcomes are mostly gradual improvements for existing services. Mostly in house R&D resources are employed although, in the past, a co-operation with other companies were experimented. Currently, no external resources are used for the development of a new products and services. The outcomes of R&D projects cover a wide range of issues related to services delivery process, enabling technologies, services linked with physical products, service delivery channel and the service offer/concept itself. As Turktrust is the leader on Turkish markets having 70% of market share. Our competitors imitate new services that we have developed mostly in one or two months. Since our competitors do not have R&D Department, they can only imitate the process, of course, not the whole product. Our IP protection is based on registered brand names and copyrights for software products.

In order to improve the performance our R&D we ought to have more: funds for development, experienced personnel, and training opportunities of R&D personnel. In the future it would benefit us if the electronic signature of the documents would become more common and more secure in nature. Besides legislating on the use of electronic signature we could benefit from increased public funding for R&D.

2.9.2 IES Education and Information Technology - Education solutions

The roots of the company date back to 1988, when it was first established in Turkey, as a part of the TUBITAK (Scientific and Technological Research Council of Turkey) for research on pedagogy and educational technology purposes. The group was privatized in 1996 and it took the name Sebit. The business started with content development for technology based educational solutions. Today its main competence area lies in education solution provision, and it offers services such as consultancy, platforms, content development, deployment, training and customer support. The business has transformed itself from products to services during the last decade. In addition to standalone services, all products are now complemented with support services. The major share of its turnover comes from the projects that involve integrated services. Therefore, the R&D in services receives constant attention. This is reflected in the organisation which employs 88 full time, 1 part-time, and 9 contracted R&D staff focusing on services development. Besides R&D staff IES is investing in necessary hardware, software and employee training as part of the R&D in services.

The company has adopted a matrix organization where technical excellence lies in the functional teams while the tasks are executed in the process teams. These process teams consist of different number of varying functional team members. Therefore each project organization is formed with a new team setup, and by the end the project these teams are disintegrated and new teams are formed for other tasks of other projects. This structure is perceived efficient in the sense that, it enables creativity and innovation because it requires a lot of collaboration among the team members to accomplish the required tasks. Almost all of the development team with the marketing team are working to carry out services R&D activities. IES has two main types of budgeted resources for the R&D. In the case of customer contracted service projects some budget is allocated for the R&D. The business invests a significant amount of resources in internal R&D projects that can aim at totally new service product or a variation of the existing service. The investments are mainly targeting the process optimization, such as technical infrastructure of the company (HW, SW, etc.) seeking to improve the development process during project execution. These activities always have measurable targets with specific time limits/periods. On average new services are launched twice a year. In terms of public support, the business is located in a technology innovation research park where the companies have tax incentives for their R&D activities. Besides, some of the projects are granted partial public funding. Typical bottle-necks related to R&D in services are related to changing requirements, and delays in the collection of funds/grants from the national and international sources (usually it takes 6 month at the minimum to collect eligible expenditure from public funds. Another problem is the personal perspectives of referees for granted service EC funded R&D projects. They either tend to steer the project towards their personal goals/understanding of the project/personal background, or they support the project to some extent which is outlined by their subjective judgement. If the referees or the projects officers are competent enough, they can promote the R&D efforts as long as they are reasonable. Otherwise, the project activities can be blocked easily.

The services R&D projects mostly deal with educational/training transformation in schools or in corporations. Therefore, it almost always deals with new methods, new procedures, new tools for the people who used to learn in the traditional/old fashion. Most of the time, the services we design are targeting ease-of-use for the people in this transformation stage. Therefore it becomes vital for us to take a clear picture of the existing service and grab the requirements of the customer/user/fund raiser to design what is needed. Typical stages of the project include: *idea generation* where almost all of the staff is involved developing new ideas related to their own responsibilities. The second stage involves *idea development and design* where after finding out the necessary team who should deal with it, these teams start work on the idea to solidify the fundamentals. The key skills related to R&D in services involve: observation of customer needs, effective communication within the development team, critical thinking and problem solving, system approach, team work on multi-skilled issues in particular, Go/no go decision, planning and development, piloting and finally market launch. Customers and end users are the typical sources for new ideas. The marketing team sometimes tailor the needs of the customers and bring in as a new idea. Besides, the R&D staff frequently brings about new ideas about internal improvements. We also use external consultants, research partners, subcontractors and clients during the R&D activities. Most of the time the R&D provides gradual improvements whereas in some cases, the R&D outcomes may redefine the whole service provision.

Most typical outcomes of the R&D involve changes in: service delivery process, use of technology which is enabling the introduction of novel services, service delivery often allowing clients new ways of access to educational services, and new services based on the changing market needs. In addition, new services act as a catalyst for the renewal of the whole organisation. The services R&D help us to improve our internal processes as well. Depending on the nature of the service design, we may end up with changing the internal processes to support the delivery of the services accordingly. In terms of IP protection, our competitors most often imitate the process we use in delivering the services. However, the data we provide during this service provision can not be copied/imitated easily. Therefore we try to be differentiated with the whole experience we provide, including process and the data. We increase the barriers for the provision of quality data which is coupled with the process during the service provision. That is something hard to imitate but easy to copy. In that case we rely on the copyright laws and legislation. The main future development needs related to R&D in services include:

- National and international standards setting for service products (such as help desks, software as a service, maintenance services). For these products there has to be national standards as well so that on top them innovative services can be researched. These bodies should standardise at least the interface between the service and its consumer.
- For relatively mature services there needs to be observatories (dedicated market research groups) who track the markets for these services and describe when a de facto interface emerges (e.g. payment services in e-commerce)
- Evaluation methodologies on services need to become public knowledge. There methodologies should monitor not only direct performance goals but also indirect goals such as cultural, economical and organizational ones that a service may strive for.

The following includes suggestions for public authorities and ways they could support R&D in services:

- For the IT sector, as of today, the market size in services is larger than hardware and software markets combined! There are still countless areas where no service offering is designed for, or new areas emerge which ripen as more and more lower level services are emerging. Increasingly almost all hardware and most software is pushed down to commodity level and largest profit margins are available in service products. This fact must be recognized at the national level and proper policies must be installed.
- R&D for services is mostly carried out in corporate R&D units, rather than national laboratories. Special funding programmes for such projects would be encouraging
- As with all markets, services market requires an ecosystem to thrive in. This ecosystem comprises brokers, suppliers, observatories, aggregators, policy makers, commerce laws etc. A public institute can perform the market maker role and promote various elements in this ecosystem (especially if they are missing) and enrich the ecosystem.

- Primary virtues of a service are saleability, speed and flexible pricing. When commercial companies launch services the business culture in the country should inadvertently entail a global agenda, continuous improvement in speed and flexible cost models. These principles should be promoted by public bodies and such companies must be provided with “public services” to easily spread at a global scale, certificates that set speed goals, and taxation to support flexible pricing.

3 Synthesis of case study findings and R&D in services

Public funding and R&D in services. In the examined service businesses public support for R&D tended to be concentrated towards the businesses that were carrying out technology related projects such as software development, or services development in connection with manufactured products. At the same time public supports for traditional services was limited among the case businesses. Here, the legacy of technology policy is recognisable, and also service businesses ability to utilise public R&D funding seems to be somewhat limited.

R&D staff in analysed service businesses. The number and status of dedicated R&D staff was also clearly related to the type of services that case firms were offering. In the technology related service businesses the number of full-time R&D staff was clearly higher than in service firms in general. Typical service firms had very small numbers of full-time R&D staff, and much of the work was carried out on part-time basis in connection with customer projects.

R&D resources and their use. The allocation and use of R&D resources portrays a wide variety of different practices. Organisational and personnel development seems to play a strong role as an R&D activity. In several cases, R&D in services was related to new skills and competences development within the business, rather than new service products development. Again, technology related and software services seemed to have most formalised type of R&D processes, with budgets and dedicated staff in place. Traditional and knowledge based services only seldom had R&D budget, or an R&D department. Instead, internal development projects are the key form of R&D and these are not typically recorded as R&D costs. According to interviewees, up to now there has not been internal, nor external incentives for keeping such records. Case businesses illustrated a wide variety of different practices in terms how they used the external R&D resources. While some digital content- and education businesses were extensively using external R&D services, many other businesses relied solely on their own resources, e.g., those businesses that were offering security services.

R&D process and organisation. Typically R&D in services were organised as projects that had budgets and objectives. So there were allocated resources for R&D in services, even if the R&D budget as such did not exist. However, the project budgets could be significant ranging from few thousands to several million Euros. It was mainly in manufacturing and software businesses where traditional R&D departments were carrying out the work. In most service businesses R&D in services was informally organised. The nature of R&D projects portrays wide variety of different configurations. While there were some projects aiming at a new service outcome, there were an equal number of projects that were targeting internal organisation, processes and competences development. Typical projects were team based and there was a clear emphasis on customer needs analysis, market and megatrend analysis serving as important sources of new ideas for services. Some firms were utilising matrix type organisation where the R&D teams were involving marketing and sales people. Often the R&D staff was engaged in the development of incremental service improvements, and majority of the R&D outcomes seems to be gradual changes to the existing services. However, sometimes the R&D in services

may result into a change of the entire service offer, and in such situation services can act as a catalyst of change transforming the entire organisation. While ICT and other technologies play a key role as enablers of new services, availability of skilled staff is equally important for new services development.

Some R&D bottle-necks were identified. Cyclical nature of the business and lack of skilled personnel were brought up as issues that can have a negative influence on the R&D in services. In addition, inefficient markets can create a barrier for the take up of new ideas. For instance, service markets are often fragmented and very small firms may have limited capability for new services development. Instead, such businesses may focus on price competition that leaves little, if any room for longer-term service development. Also customers may be keen to go for lowest price rather than improved services. Internal organisation R&D in services can also create bottlenecks for new services development. It was indicated that too discipline oriented organisation of R&D activities does not create a fertile ground for services development. In many industries life-cycle effectiveness is seen as a starting point for services development, and this approach requires a more horizontal type of an R&D organisation. Also service culture, or rather lack of it, was also brought up as an issue that can influence R&D in services. Highly developed service culture can be very beneficial for the service suppliers as it tends to facilitate the development of well functioning markets. Advanced service culture that emphasizes quick response to the customer needs can also speed up time to market cycle in the services R&D process. In many services businesses R&D staff is working on part-time basis. This seems to have both positive and negative influences. Especially in the SMEs, there is a trade-off in doing R&D and earning money by providing existing services. At the same time, part-time R&D staff is often working closely with customers that improves their understanding on the market needs. Finally, sudden changes in client requirements, problems in obtaining R&D grants, changes in standards and legislation were brought up as situations that can cause bottlenecks for the R&D in services.

Intellectual property management and protection was an area where technology related and software services were somewhat different from much of the other types of services. They used patenting, standardisation, software licensing as protection methods. In other types of services IP protection was often less formally organised and competitors were typically able to copy the service outcome in a couple of months time. Such copying was hard to prevent, but in many instances competitors could only copy some aspects of the new service, not the entire process. Here lead-time advantage and time-to-markets were seen as an essential element of the IP protection and management.

Public policy support for R&D in services – some business perspectives. It is a common argument that the integration of service businesses to the public research and development institutions could be improved. Case studies brought up a number of barriers that are currently hindering closer co-operation between service businesses and public sector R&D institutions. Several service enterprises expressed their view that public research programmes could support R&D in services much more than they currently do. In addition to direct support for business R&D, public sector should pay attention to creating an eco-system and markets where services markets thrive. Brokers, suppliers, observatories, aggregators, policy makers, and commerce laws were brought up as important elements of such eco-system. Also tax incentives were

seen as a useful way to develop favourable environment for R&D in services. For instance, it was suggested that tax incentives could be targeted to businesses that locate in research parks and carry out R&D projects. Legislation could also be used as a way to create demand digital services, like for instance, the use of a digital signature. Existing procurement legislation was seen as a potential problem as it seems to favour too much the lowest bidder, rather than innovative solutions. At the moment there are also a number of bottlenecks that are preventing closer linkages with the public research institutes.

- It was indicated that co-operation with research institutions is more appropriate in the fundamental level R&D projects, the further away the development is from business projects the better. For instance, one such situation is the development of theoretical frameworks that the business can utilise in its business strategy development.
- As the R&D project is closer to everyday business, co-operation with individual academics were seen as more appropriate way to link with the public R&D system. To facilitate this, there could be more incentives for individual researchers to co-operate with businesses.
- Typically public research planning horizon is much longer than the development cycle in the businesses. For businesses it is difficult to commit to one research topic for many years, as the public R&D often does.
- Too strict fixing of research questions was also as seen as a potential problem, since in businesses the research problems often evolve during the process, and also totally new problems may arise during the progress of the R&D project.
- Public funding could benefit R&D in services better, if it could be more widely used for employee training.
- Several businesses indicated that they had limited resources to cope with the administrative procedures of public funding. Administrative burden of public research processes may also overstrain the capacities of small firms that also had limited competence in applying public supports.

Future issues influencing R&D in services. Some of the emerging future issues included service related standards, evaluation methods and the need for high quality market research. It was indicated that there is a need for national and international level standards that are likely to develop for services such as helpdesks, software as service and maintenance services. Such standards can advance the competitive markets and thus act as drivers of innovation. There appear to an increasing need for market research groups that are able to track opportunities for new services and estimate when the demand for new services will emerge. Evaluation methods on services were seen as essential as well as the wider awareness on such methods.

Appendix 1:

Name of the interviewee: _____

Name of the organisation _____

Time and place: _____

/ 2007

European Commission
DG Research
CREST / Working Group

Research and development in service enterprises

Case studies exploring the nature and organisation of R&D in service enterprises

First of all, I would like to thank you for your valuable time for this discussion. First hand accounts are most important for the research at hand.

CREST Working Group on services R&D is exploring the nature of R&D activities in service enterprises. The aim is to build up knowledge in the area so that national and EU level policies could be developed more effective and supportive for the R&D in the service context.

••••

Interviews are strictly confidential. We shall report any outcomes only after we have received clearance to do so from the interviewee. A draft transcript will be provided for the interviewees so that they can assess the outcome. In case you do not want to discuss any of the presented themes, please do indicate so and we can move on to the next topic.

The aim of the case study interviews is to obtain interviewees insights and views on services related R&D. This means that the interviewees own perspectives and opinions are valuable, not only the facts and figures on R&D.

GENERAL INFORMATION

(NOTE: Much of the general info can be obtained from the secondary sources thus saving interview time for other questions)

1. To start with it would be interesting to hear a bit more about this firm. Could you begin by telling me how this firm began and how it has developed?

1.1 The firm was started in? _____ The founder was? _____

1.2 What are your current responsibilities in the firm?

1.3 What kind of services did this firm initially offer?

1.4 Could you describe the services that your firm offers now?

1.5 How important role services play in the business of your firm?

1.6 How many people currently are working for this firm? _____

1.7 How many people are involved in services research and development? _____

- number of part-time R&D staff? _____ - number of full-time R&D staff? _____

- number of external / outsourced personnel working in the services R&D? _____
(contracted researchers, R&D service firms, clients, sales staff, others)

1.8 In addition to human resources which are the other R&D expenditures in your business?
(Tangible investments e.g., equipments, Intangible investments, e.g., purchase of licenses)

2. *The nature and organisation of services R&D activities.*

2.1. Now, could we start to discuss about service related R&D in a bit more detailed manner. To start with, could you describe how you have organised of services related R&D in your firm?

2.1.1. Do you have a separate unit, team or section to carry out services R&D activities?

2.1.2. Do you have objectives and budgeted resources for R&D in services?

2.1.3. Does your enterprise benefit from any kind of public support for its R&D?
Probe: e.g., direct financing or subsidies, indirect support e.g., tax incentives.

2.1.4. Is the support coming from national, regional or from the European sources?

2.2. Could you tell about new or improved services that have been introduced during the last 12 months time?

2.2.1. On average, how often you launch new or improved services on the markets?

2.3. Can you mention any bottle necks that are typical of R&D in services?
(Probes: skilled personnel, lack of financial resources, pressure to cut down development time etc.)

3. Services R&D process

3.1. Could you tell me about the key features of a typical services R&D project ?

3.1.1. Are there some typical stages in the R&D process, and could you talk through them?
(e.g. idea generation, idea development, service design, go/no-go decision, market launch)

3.1.2. What do you think are the key skills needed in services related R&D?

3.1.3. Are there some typical sources for new ideas, e.g., your clients, suppliers, sales force?

3.1.4. How many months it typically takes to develop a new idea and launch it to the markets?

3.1.5. Are the R&D outcomes typically gradual improvements or more fundamental changes to the existing services?

3.2. What types, if any, external resources you use in your services R&D?
Probe: consultants, research institutions /researchers, clients, suppliers

3.3. Could you characterise typical outcomes of services R&D?

Probes: are these outcomes related to?

- [] Service delivery process (e.g., self service, electronic banking)
- [] Technology enabling new types of services (digital photo services)
- [] Services linked with physical products (warranty service package with the cars)
- [] Service delivery channel (e.g., internet bookshop)
- [] Service offer / service product (internet order site + home delivery of groceries)
- [] The entire business model of the firm (low cost / budget airlines)

3.4. How quickly your competitors tend to imitate new services that you have developed?

3.4.1. What type of actions if any you take to prevent copying of your services?

4. Improving the performance of services related R&D

4.1. What do you feel are the main improvements that the current services R&D process could benefit from? (Probes: e.g., more skilled personnel)

4.2. Future development needs related to services R&D, can you name some?

4.3. What do you think that public authorities could do to promote R&D in services?

Probes: e.g., increase awareness, education / availability of skilled personnel, research in the area, support for R&D

4.4. I have now gone through all the issues that I had prepared for this discussion. Do you have any further issues in your mind that you would like to bring up to this discussion?