Forerunning innovation support in the field of non-technological innovation

Evaluation of Non-technological Programmes

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Evaluation Report

owalgroup

Tekes

Tekes – the Finnish Funding Agency for Innovation

Tekes is the main public funding organisation for research, development and innovation in Finland. Tekes funds wide-ranging innovation activities in research communities, industry and service sectors and especially promotes cooperative and risk-intensive projects. Tekes' current strategy puts strong emphasis on growth seeking SMEs.

Tekes programmes – Tekes´ choices for the greatest impact of R&D funding

Tekes uses programmes to allocate its financing, networking and expert services to areas that are important for business and society. Tekes programmes have been contributing to changes in the Finnish innovation environment over twenty years.

Foreword

It has been widely understood that innovation is much more than technological product or process innovation. During 2000's, Tekes-funded projects have changed from purely technological projects and product R&D to general business development with the purpose of increasing competitiveness on the market. In this development three non-technology focused programmes have been forerunners.

The aim of Muoto programme (2002–2005) was to develop the level of design research and skills, and the use of design expertise in product development and business strategy of companies. The Liito programme (2006–2010) provided funding and built networks between business research and companies that are striving to develop new business know-how and operating models. The Serve programme (2007–13) targeted at encouraging Finnish companies in the customer-centric, knowledge-based service business. Serve promoted the creation of innovative service concepts that included new and unique value promise to the market, value-based earnings logic and scalable business model.

The evaluation consisted of three parts. Liito and Serve were evaluated from relevance, efficiency and results perspectives. The impact analysis was made of Muoto and Liito. Finally a comprehensive international benchlearning covers non-technological innovation support development in five relevant countries. One important finding is that development projects especially in non-technological programmes and their success are mainly dependent on the key personnel involved with the project. Another note is that in business model and operational model innovations, the projects should always include a field test within the actual services in order get sustainable results.

The programmes have been evaluated by an expert team led by Owal Group oy. Tekes expresses its warmest gratitude to Olli Oosi, Rama Gheerawo, Janika Keinänen, Leevi Parsama, Antti Pitkänen and Mikko Wennberg for the systematic and in-depth analysis and clear-cut recommendations. Tekes thanks also all those who contributed to the evaluation in steering group, interviews or otherwise. The work done gives solid ground for successful innovation programmes in the future.

Tekes

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Introduction

This is the evaluation of non-technological programmes of Tekes, which was carried out between February and May 2016 by Owal Group Ltd. Antti Pitkänen (S.E.O.S Design Ltd), Rama Gheerhawo and Leevi Parsama have also contributed to the evaluation. The evaluation focused on three programmes Muoto (2002–2005), Liito (2006–2010) and Serve (2007–2013).

The evaluation has focused on overall review of operating environment of the programmes and comparison between Finnish programmes and some other countries. For Serve and Liito, the achieved results, relevance and efficiency is analysed. For Liito and Muoto, an impact analysis is made. Conclusions and recommendations in Chapter 2 are structured in two parts. Firstly, we look at what are the learnings from the programme for innovation policies and activities in more general sense and second part focuses more in the activities inside Tekes.

The evaluation design combined realistic evaluation and service design thinking. As we are dealing with subjects that were new to Tekes, and to some extent to the participant companies, most of the available data is qualitative by its nature.

This report consists of five main chapters. Chapter two presents key conclusions and recommendations from what can be learned from the non-technological programmes. Chapter three describes the programmes and discusses their context. Chapter four includes main findings from desk review and interviews concerning Liito and Serve programmes, and chapter five includes findings and case examples of the impacts of Muoto and Liito programmes. Chapter six describes related development phases in other countries.

2
Conclusions and recommendations

2.1 Summary of key findings

Overall, the evaluated programmes reached their goals and expectations relatively well. One should note, however, that the goals of the programmes transformed during their implementation. Figure 1 presents the overall summary of the key goals and how well they were met based on the findings presented in Chapters 4 and 5.

A viewpoint of the programmes comes from service dominant logic. The most important findings of the programmes in relation to touch points between programme services and clients are illustrated in Figure 2.

Figure 1. Illustration of the success of the programmes towards main expected goals.
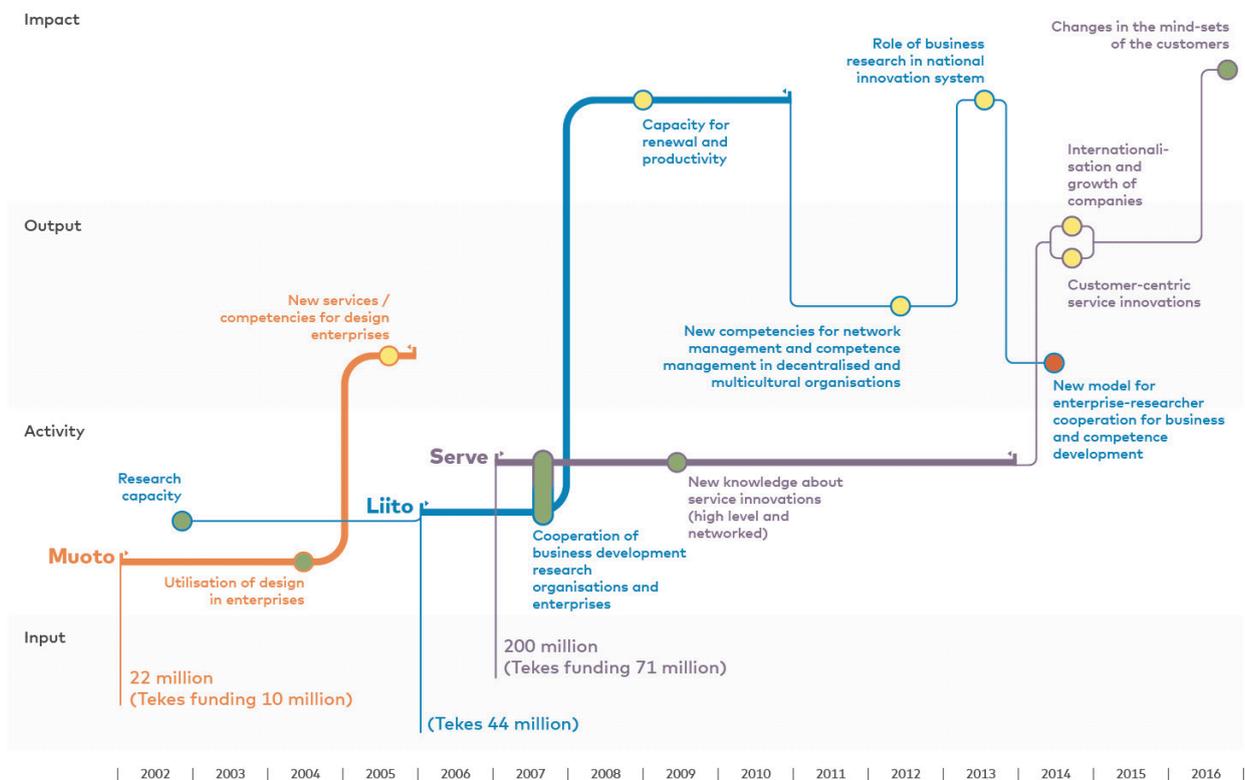
Figure 2. Illustration of successes and challenges through touchpoints (adapted combining Virtanen and Stenvall; Lusch and Vargo 2006, Lusch, Vargo and O'Brien 2007)**.**
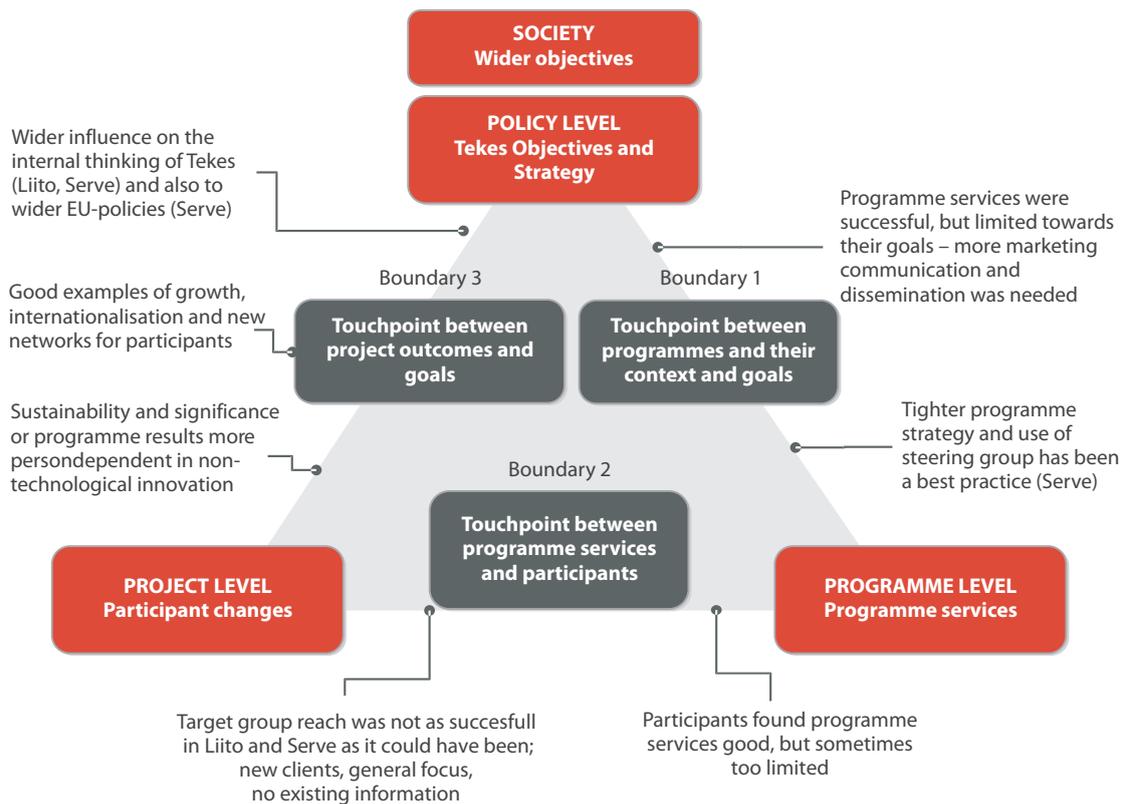
2.2 Business, design and service R&D, and innovation activities for the future

Introduction

The programmes under evaluation have generated a vast amount of innovative concepts in companies and research organizations in the field of business, design and service research, development and innovation. The key challenge at the project and company levels comes from the sustainability of the results and the importance of the key persons. The second important factor has been that those projects that have included actual analysis of market potential and client needs, combined with real product and service development of the company, have had a more lasting impact than those focusing on pure development of the operational practices (i.e. innovation process) or those developing "only an additional service layer or component" (i.e. service experience or overall design strategy).

Key learnings

The projects within the field of non-technological innovation have included more business / market analysis component or some connection to core products and services for the company within these programmes. This has been successful practice. For business model and operational model innovations, the projects should always include a field test within the actual services.

Development projects in non-technological programmes and their success are mainly dependent on the key personnel involved with the project. This is relevant for both project leaders as well as partners and the leaders of host organizations. Many of the cases demonstrate that personnel changes cause major discontinuity in the innovation and development processes in these types of programmes. This also emphasises the need for good partnership management practices. Many interviews also point out that development projects with research partnerships should not be too long.

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The sustainability of the project results is quite often called into question in the interviews. In several cases, important changes in the organizational setups (mergers, changes in leadership, new strategies) have meant that some of the key results of non-technological innovations are not sustained within the company.

New measures

Recommendation 1. **Tekes should create new initiatives in the field of non-technological innovation in with other Nordic countries.**

Tekes could benefit from utilizing its expertise in the field of non-technological innovation in trying to create shared innovation programmes with other Nordic actors as it has done in other fields.

The evaluated programmes have been rather unique and forerunning from an international perspective. They have had some influence on EU-level policies and international policies, especially when it comes to promoting service innovation. However, not all international possibilities have been used. Tekes has a long tradition of cooperation for example with the Swedish innovation agency Vinnova. More systematic benchmarking and shared programming or measures could be done at least together with Nordic innovation funders.

Research results dissemination

Recommendation 2. **All research projects should focus more on communication and dissemination activities across the industries in the field of non-technological innovation research. Dissemination should be tailored to be something more than publications and single dissemination seminars.**

In terms of research, the programmes had impacts on various areas. Despite the criticism for granting the research based on research plans and not merits, the overall model in the evaluated programmes seems to work according to interviews and desk analysis. Funded research projects have been pragmatic and participation of actual companies in the steering groups of the research projects have created synergies. Even more, and even closer, cooperation between the research programmes of Tekes and the Academy of Finland would be beneficial.

Some of the research conducted in the programmes had important impact on the particular research landscape in Finland. Some of the same researchers had a continuity of research programmes in different projects. Continuity in research is important for its advancement. However, the more project based short-term research, encouraged especially

in Liito, has promoted more learning at the companies participating in the project.

Tekes has had limited resources for dissemination activities in the programmes, and its ability to reach the target groups has been to some extent limited. This means that most of the results and learnings from the research-intensive programmes are never disseminated. Tekes could both include more dissemination activities in their programme services as well as demand it from the research projects.

Lack of continuity

Recommendation 3. **Tekes should continue funding innovation in the areas of design innovation, leadership innovation, business model innovation and service innovation and ensure that the competencies are clearly established and communicated to potential clients.**

Today, the role of services, business R&D and the importance of design are more evident than before the evaluated Tekes programmes. At some level, all of these themes are present in current innovation policy strategies and discussions. The evaluated programmes have provided an initiation effect for developing the policies further. One of the challenges for innovation policy is at the same time a lack of continuity of development and the wrong kind of continuity.

Lack of continuity means that while some of the themes are still developed and funded through other Tekes programmes and other national initiatives, many themes, especially service innovation and service development, as well as business model innovation in connection to digitalization, are faced with a lack of "ownership" within national innovation policy framework. This means that there are no competencies named for these sectors or themes, but they are embedded in various programmes. A question is whether such ownership would help Tekes and other national actors to communicate better with business and research organizations.

The need for continuity seems to focus on business innovations and service R&D&I. In terms of design, it seems that the overall environment promotes the use of design well enough, and the role of public intervention is sometimes even questioned in the expert interviews.

The themes from the programs are still seen quite relevant and according to many clients, and especially research organizations, the themes should nowadays be even more visible in Tekes. Some of the clients participating in the evaluated programs still continue working with Tekes and the themes are present in other Tekes programs, such as Liideri or Fiiliksistä Fyrkkaa. Many persons are still looking for specialized ownership within takes for design, service innovation or business development innovation.

The challenge raised by many stakeholder can be partly explained by the notion that many clients see Tekes' programs more important funding streams than they actually are. Most of the participants see the programs as a separate funding pipelines with their own clear decision making structures and reserved funding. However even the evaluated programmes are in a sense more like "measures for activation" within the particular theme, rather than holistic programs with separate budgets as such. This, combined with the personnel rotation in Tekes, makes it difficult to establish the expertise within these kind of new themes.

Thus these themes should still be in focus of Tekes funding but with a tighter sectoral focus as stated in the recommendations in the next section.

2.3 Developing programmes and programme services

Revision of programme services

Recommendation 4. The future programmes should have more clear advice and expert functions as part of their programme services, and communication services should be geared towards more proactive marketing communication services if the themes are as new as in the evaluated programmes.

Recommendation 5. Tekes should invest more in communication and dissemination activities when it comes to programmes that have awareness-raising objectives. Especially Liito and Serve had very far-reaching objectives, but the actual implementation of the programmes does not support the attainment of their goals.

New types of programmes need more investment in new-client activation and tools to do that. However, at the time the evaluated programmes were implemented, email communication and print-media had more prominent role than nowadays.

Planning of non-technological programmes might require more involvement from the actual networks of the potential target group, not just the research or advocacy organizations. The widening of the programmes means that their implicit role in building cooperation inside Tekes becomes more important than realized. This implicit objective was not reached as well as expected.

In the field of design, working life and business development, many other measures are used to promote change in the particular theme in business development, including prizes, campaigns or collaborative platforms and networks, or even vouchers.

Most of the evaluated programmes have not been sector focused, which has helped to implement a multidisciplinary approach, such as design or service development. The recommendation means that utilization of design, market research, service design or business model innovation, for example, should be connected to either particular target sectors, challenges or technologies in the future, rather than being the target of funding in itself.

Recommendation 6. The programmes should have a clearer and more decisive programme strategy, especially regarding those goals that are not directly linked to the project funding but to other activities of the programme.

All three evaluated programmes included some kind of objectives influencing national policy making or influencing innovation funding implemented by Tekes. The objectives have been rather far-reaching and ambitious. Many observations in the evaluation interviews point out that the investment in communication activities was still, despite all the effort, limited towards these goals, and that the connections from different types of international networking should have a clear relation to the programme objectives. However, for example in Serve, the internal programme strategy was created more concurrently during the programme implementation, which, when comparing the three programmes, is found to have been a best practice.

3
Contexts of the programmes

SUMMARY

- The 2000's brought understanding of the design as a major factor in global competition. The 1998 report on the State and Future of design in Finland released by Sitra, and the Council of State's Decision in Principle on Design Policy (2000) stressed the urgent need to develop broad based industrial design research.

- The programme Muoto, one of the first in Europe, mainly focused in innovation, industrial and user centred design.

- The use and understanding of design in Finland has matured to a level at which there is a range of companies using design for operational, tactical and strategic purposes. Nevertheless, there is a major difference in the understanding and performance of the design intensive companies and the companies, which are yet to take advantage of design. The traditional industries and the SME's are still not using or are often not aware of using design services.

- The rapid transformation is due to the interaction of multiple, simultaneous phenomenon that affect the design profession both nationally and internationally. Design has become an integrating function, enabling collaboration between multiple disciplines and departments.

- The role and importance of service business has increased in the last decades all over the world. The shift from industrial production to service business deals not only with industry sector but the whole economy and all industries. It can also be seen in people's everyday life.

- For instance, the Federation of Finnish Technology Industries and VTT Technical Research Centre of Finland founded BestServ forum in 2003 for companies interested in service business. This laid ground for Tekes' Serve programme launched in 2007.

- The Liito programme was the first Tekes' programme to focus on the development of innovative business models instead of traditional product or production solutions. Discussions about business models peaked at the same time in international management literature and practice.

3.1 Descriptions of the programmes and their logic

MUOTO (2002–2005)

Muoto programme, which was in operation between 2002 and 2005, aimed to develop the use of design widely and to make design a competitive edge at national level. The aims of the programme were:
- to develop the level of design research in Finland
- to develop the skills of design agencies to strengthen their services
- to increase the use of design expertise in product development and business strategy of companies.

The target group of the programme included research organizations, design agencies and design-utilizing industry. The idea was, with a research base to create new service offerings that would increase the demand for design know-how. One of the aims was to raise awareness of opportunities provided by the wider use of industrial design.

The total volume of the programme was 22 million euros, of which Tekes funding accounted for 10 million euros. 48 company projects and 23 research projects were realised within the programmes. Regarding company projects funded by the programme, some 40% of the participating companies were small and 45% were large with some 10% being medium sized companies. Over half of the participating companies were from industry, some 10% represented wholesale and retail trade and 20% represented professional, scientific and technical activities.

LIITO (2006–2010)

The Liito programme was the first Tekes programme to focus on business development in general – not only technology development. Liito had an ambitious aim to improve the competitiveness of enterprises operating in Finland. This was done by
- developing operations and skills of Finnish companies to support their success on the global market

- supporting companies in their strive to renew operations, commercialization of innovations and increasing productivity
- targeting business research to serve the needs of Finnish companies in future challenges and to start a new change towards new cooperation networks and practices between companies and research units
- to create new skills and know-how for network management and skills management in fragmented multicultural organizations.

The programme had as a further, ultimate aim to increase cutting edge applied business research in Finland to create know-how and abilities in order to promote cooperation between research units and higher education units. This was done by
- creating a new operating model for companies and researchers to support cooperation and development of company operations and skills
- to strengthen the role of business research in the Finnish innovation ecosystem.

Where in Muoto the main target group of the programme was product development management, in Liito the main target group was the top general management of companies. The programme was in effect during 2006–2010. Liito consisted of 89 company projects and 71 research projects. Altogether, 180 companies participated in the projects, with one half representing small companies and 40% representing large companies with over 250 employees. Over one third of the companies represented industry, one fifth professional, scientific and technical activities and 15% wholesale and retail trade.

The Liito programme funded 89 enterprise projects (worth approximately 16,5 million euros). The funding was not sector-based and the participation of companies varied from microenterprises to larger enterprises. Most of the projects were single-company projects but a few group projects were also funded. (Tekes 2011).

A total of 71 research projects were funded (approximately 27,4 million euros). Almost all research organizations and universities participated in the programme. The State Technical Research centre (VTT) was the largest participant, with six projects in the programme. Research projects were required to cooperate with several research organizations, enterprises and internationally.

The programme funded projects under five main categories:
- Customer and relations management
- Innovation management
- Management of networks and partnerships
- Strategic leadership
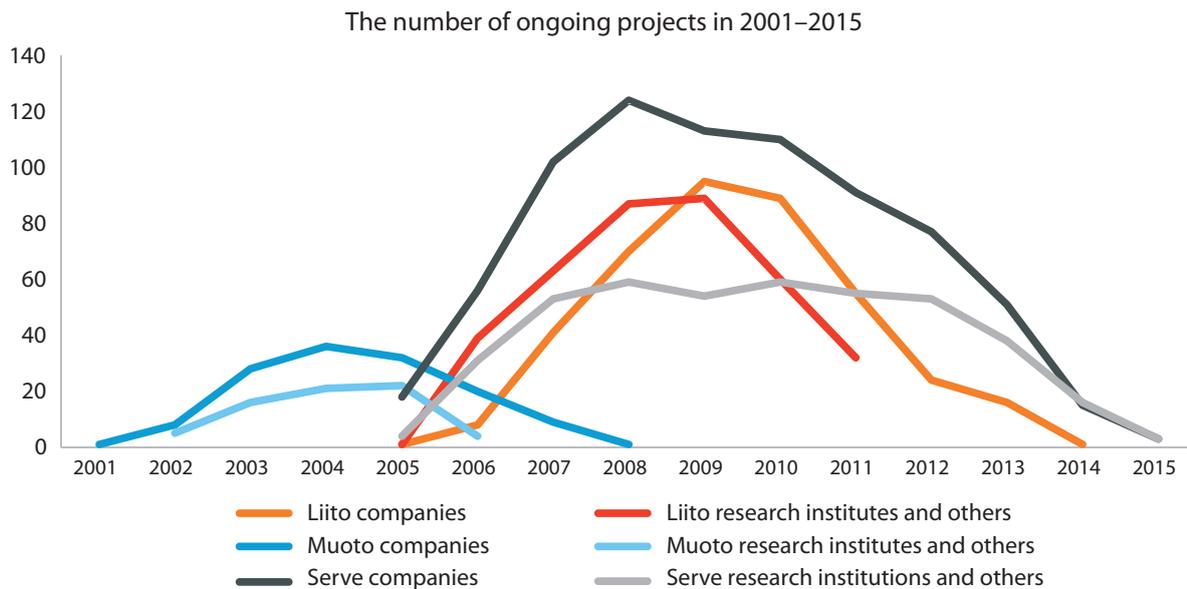- Competence management.

SERVE (2007–2013)

The Serve programme aimed to encourage Finnish companies to become global forerunners in service business. The ultimate aim was to promote the creation of new innovative service concepts for Finnish companies. The aim was also to increase innovation activity in services and broaden the overall understanding of the mechanism behind service innovations. The strategic aims of the programme were
- to support the creation of competitiveness enhancing service business models and concepts within companies
- to support the creation of internationally interesting and competitive service businesses sector in Finland
- to promote internationally high-level service business related research.

The programme was initially designed to be a four-year programme between 2007 and 2010. After the mid-term evaluation in 2008 the focus was slightly changed and the programme was granted a three-year extension period. The programme lasted eventually until 2013. On the latter part of the programme the overall target was transformed to support the creation of global forerunners of customer-centric service business and the programme focused on the so called second wave service business, challenging traditional ways of doing things both at the strategic and the operational level. Serve promoted the creation of innovative service concepts that included new and unique value promise to the market, value-based earnings logic and scalable business model. This was very exceptional for Tekes programmes. The extension was seen as necessary to fully reach a critical mass of companies and the desired results. Also, the topic gained wide acceptance within Tekes and it was considered important to exploit the programme fully.

The initial target groups of the programme were knowledge-intensive business services KIBS (especially real estate and general business services), trade, logistics, financial services and industry. During the programme execution, it turned out that logistics, financial services and real estate services were difficult sectors to reach and activate. These were replaced by environment and energy sector and forestry and chemical industry in the latter part of the programme. The programme boosted the renewal of services also by encouraging knowledge transfer between companies and from academia to business. 60% of the companies having development projects funded by the programme were small and 30% large. Companies representing professional, scientific and technical activities accounted for 41%, information and communications 15% and industry 10% of the funded company projects. Attached to Serve, Tekes was involved in global cooperation related to service innovation promotion in the EU-level programme EPISIS.

Figure 3. Timing of the projects.

The number of ongoing projects in 2001–2015

Liito companies	Liito research institutes and others
Muoto companies	Muoto research institutes and others
Serve companies	Serve research institutions and others

The total budget of the programme was 203 million euros of which Tekes' share was 95 million. The programme covered 293 company projects and 96 research projects. Funding was divided such that the budget for the company projects was 159 million and for research projects 40 million euros.

The overall amount of projects and their timing within each programme is illustrated in Figure 3. As can be seen, the most active phase of Liito and Serve was during the time when the economic recession hit Europe. The economic downturn had many implications both for the programmes and also on the level of individual enterprise projects. According to Tekes' own classifications around 50% of the funded projects were of demanding international level and around 40% of challenging national level. Overall, a small amount of clients receiving funding from a single programme, participated also in one or two of the other programmes (13% from Liito, 4% from Muoto and 6% from Serve).

3.2 The contexts of the programmes at the time[1]

Tekes had an original role as a research and technology development funding organization. However, the acknowledgment of expanded innovation concept created a need to elaborate the role. For example, the assessment of additional appropriation for research recommended that Tekes should take action to create interdisciplinary, business, marketing and commercial competencies. The evaluation of Finnish innovation system concluded that emphasis in the system should shift from technology to innovation.

Accordingly, Tekes' mandate in funding was gradually widened and it was aimed to cover innovation activities in addition to technology. This required also a legal mandate to change the funding principles. As noted in the Evaluation of Tekes; when EU State Aid Rules also changed because of Tekes activity, support for the service component in project became possible. Since 2008, investments in the service

[1]   This chapter is based on expert interviews, social media commentary and following sources:

Aminoff, C., Hänninen, T.,Kämäräinen, M., & Loiske J. (2010) – MUOTOILUN MUUTTUNUT ROOLI, Tilannut Luovan talouden strateginen hanke, Työ ja elinkeinoministeriö.

Embedding Design in Life – Vaikuttavuusarviointi (2013) Deloitte, World Design Capital Helsinki 2012.

Muotoile Suomi – Kansallinen Muotoiluohjelma (2013) TEM, Työ ja Elinkeinoministeriö.

Ruopila, S., Haila, K. & Keinonen, T. (2009) Design Forum Finland muotoilun hyödyntämisen edistäjänä, Arvioinnin loppuraportti.

Valtonen, A. (2007), Redefining industrial design – Changes in the Design Practice in Finland, Taideteollinen korkeakoulu.

Vepsäläinen, A. (2015) TAPAUS: MUOTOILIJA 2025 – Hypoteesi muotoilijan ammatillisesta tulevaisuudesta. Opinnäytetyö YAMK.

sector (excluding the service innovation) have been larger than investments in industry. Muoto and Serve both have context in different aspects of development of design.

Industrialization of design

The rise of the industrial sector and the increase in demand for industrially produced products led to the start of design education in Finland in 1961. The increase in the understanding of the benefits of design quickly gained traction and the collaboration between the industrial sector and the design industry became more popular. The development of the electronics industry during the 1970s and early digitalisation of industrial processes lead to the development of the first computers and CAD software by the end of 1980s. Considerations for ergonomics and user needs had started to become increasingly important as well as design management to develop not only products, but product portfolios with distinct identity and brand. In the 1990s the focus shifted to user experience and consideration of the point of sales, packaging and product appearance in creating customer experience. In education, the Design Leadership Program (1991–1998), was followed by the creation of other educational programmes such as the International Design Business Management (IDBM) and Product Development Project (PDP) of the three schools (Design, Engineering and Business) that later became to form Aalto University.

Globalization of design

The 2000s also brought an understanding of the design as a major factor in global competition. The 1998 report on the State and Future of design in Finland released by Sitra and the Council of State's Decision in Principle on Design Policy (2000) stressed the urgent need to develop broad based industrial design research. As a result, Muoto 2005! – the national design policy programme (2002–2005) in collaboration with the Research Programme for Industrial Design (2004–2007) by the Finnish Academy were started. The programme, one of the first in Europe, mainly focused in innovation, industrial and user centred design. The discourse around design had reached a new level of importance at which it was already seen to affect company strategies and national competitiveness as a whole.

Diversification of the use of design

Since the latter part of the 2000s the use of design in Finland has become increasingly diversified. Design has become a collaborative process, with strategic implications that could be used to develop physical objects and spaces, as well as the development of the immaterial such as brands and services.

The use and understanding of design in Finland has matured to a level at which there is a range of companies using design for operational, tactical and strategic purpos-

es. Nevertheless, there is a major difference in the understanding and performance of the design intensive companies and the companies, which are yet to take advantage of design. Traditional industries and SMEs are still not using or often not aware of design services. For these companies, design plays little or no role in product or service development and they are performed without end-user needs being considered. For the companies for which design is relevant in terms of aesthetic considerations, a professional designer may be involved in the development, but is rarely considered in terms of a process or method and is generally employed at the final stages of development. For the design intensive companies design is integral to their continuous renewal, and is seen as a means of encouraging and enabling innovation. Their design process is fused with the company's key objectives and plays a role at every stage of development. These companies can be found from the manufacturing industry but also increasingly from the service sector and a range of new start-up companies.

Popularization of design

The 2009 announcement of Helsinki's nomination for the World Design Capital 2012 led to considerable efforts to increase the understanding of design among the industry and the general public. The official programme of the WDCH2012 resulted in over 250 projects in which over 14 500 people participated in, the experimentation and adoption user-centred and service design in the public sector as well as to new types of collaborative networks within design industry. The formation of associations such as the Finnish Design Management Association (FDMA) and the Finnish Design Business Association (FDBA) and international networks of the Interaction Design Association (iXDA) and the Service Design Network (SDN), both with active local branches, have led to many events, competitions and discussion around specific areas of design. The popularisation of Design and its longer historical roots can be seen in the design timeline annexed to the report (see Annex 1).

Immaterialization and the move towards services

The increased awareness of immaterial qualities of design and the opportunities in particular of service design has led to new programmes in the public sector. Design has become an important tool in user-centred innovation policy, an integral part of the innovation process and a problem solving tool. Today, the Finnish society is facing many structural challenges, that have led to the diffusion of design into new areas, but at the same time a dispersion of the meaning of design. New terms and applications such as service design, digital design, experience design, design for government or public design, business design, design thinking and transformation design, have all made way for the era of design in Finland.

The rapid transformation is due to the interaction of multiple, simultaneous phenomena that affect the design profession both nationally and internationally. Design has become an integrating function, enabling collaboration between multiple disciplines and departments. The digitalization of many products and services has led to an increased need for expertise in user experience and cognitive sciences. The immaterialization is causing a need to understand complex product-service systems and infrastructures to deliver the public and private offering. The democratization of many of the tools used by designers has enabled many non-professionally trained designers to carry out design activities. The fragmentation of the design field has led to the creation of many new expert disciplines, with particular skill sets and know-how.

Significance of services during the last decade

The role and importance of service business has increased in the last decades all over the world. The shift from industrial production to service business deals not only with the industry sector but the whole economy and all industries and it can also be seen in people's everyday life. Service business is growing rapidly within business driven by the need to create new business to substitute disappearing traditional industry and in the private sector where consumers are consuming more and more services instead of consumer goods. The significance of service business for the national economy has grown in Finland. Today, private services make already half of the economy's value added whereas the share of industry has decreased to a level of one fifth and equals now the value added of public services.

Understanding of services at the time

Services offer companies possibilities for a competitive advantage. To derive new business from services, companies need to see services strategically and commit to continuous development of service business. Services are especially an important competitive factor for SMEs, which have been found to create more profitable new services than larger companies. Today, good quality products are not sufficient to succeed in competition. They need to be accompanied by first class service experiences. This has led to service design emerging as a methodology to develop services and service experiences.

Predecessors of Serve

The need for service innovations has called many countries to establish national service innovation policy agendas and public intervention mechanisms to support service innovations and the development of national service business to combat in international competition. In Finland, a sys-

tematic and profound R&D activity to develop services and service systems was started in the turn of the millennium after which many forums and programmes on national level to support service business have been established. For instance, the Federation of Finnish Technology Industries and VTT Technical Research Centre of Finland founded BestServ forum in 2003 for companies interested in service business. This laid ground for Tekes' Serve programme which was launched in 2007. There has been a need to speed up service related research for which numerous service business research programmes have been set up such as VTT's Service Beyond technology theme to mention an example.

Services today

The importance of heavy industry on Finnish productivity fell sharply by the financial crisis. This emphasised the importance of services as a source of new growth meaning that the growth potential of the Finnish economy will be more dependent on services. Moreover, a growing share of traditional industry's production is services. All this means that a great share of growth of export will be derived from services in the future. This calls for growing attention in reinforcing service business competitiveness and internationalization of Finnish services. Bank of Finland has estimated that the share of service exports on the GDP of Finland was in year 1990 only 3–4% but in 2010 already 12 %.

Business model, capacity and leadership innovation

Liito programme was the first Tekes programme to focus on the development of innovative business models instead of traditional product or production solutions. Discussions about business models peaked at the same time in the international management literature and practice. The ground breaking article by Alexander Osterwalder et al. on business models was published in 2005 and five years later Osterwalder introduced Business Model Canvas in his co-authored book with Yves Pigneur "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challenger". Although the term business model appeared first time in academic literature in 1957 (Bellman et al., 1957), active discussions around the concept of business models started in the late 1990s.

At the same time, in the beginning of 2000, discussion about leadership, good management practices and supervisory skills evolved in Finland. The discussion stressed the importance of leadership skills and management practices not only as drivers of innovation, but as a form of innovation in themselves. Liito programme took this as its starting point. It was the first Tekes programme to widen the concept of innovation outside of products and production methods.

Results, relevance and efficiency

SUMMARY

Target group reach, objectives and relevance	
Liito	• The programme had a very active communication strategy and activation was aimed to several levels. New target groups led to difficulties in reaching the right persons. • According to evaluation interviews, the programme was seen very relevant in introducing a more networked view of innovation processes (in contrast to earlier technological programmes) and from a research perspective creating continuity to existing research programmes and connecting business research with technological innovation development. • However, the lack of focus within the programmes is a challenge for their relevance. It is likely that not all needs were addressed and some sectors, where business model innovation and business capability development would have been important, were left outside the scope of the programme.
Serve	• The Serve programme engaged in an extensive amount of enterprise contacting and activation. Many interviewees point out that the overall client reach was quite extensive. There were several subsectors that Serve aimed to reach. • The programme had, however, difficulties in reaching some of the target fields and industries. • Almost all of the interviewees see Serve as having been a very relevant programme at the time. Most point out that it was also a forerunner programme in itself. This can also be seen in the fact that it was internationally a rather unique programme, meaning that good benchmarks are hard to find. • The need for Serve was characterized by the "old-fashioned" understanding of services within Tekes and within other funders at the beginning of the programme. • Some interviewees commented that the internal mission of the programmes should have be more explicitly stated than it was in Serve.
Results	
Liito	• Liito funded 89 enterprise projects (worth approximately 16,5 million euros). The funding was not sector-based and the participation of companies varied from microenterprises to larger enterprises. A total of 71 research projects were funded (worth approximately 27,4 million euros). • At the time of the mid-term evaluation, enterprises involved with the programme mentioned that the projects had resulted especially in new processes and new operational practices, business and research collaboration networks, new capabilities and competencies and new business opportunities. Almost all persons interviewed from the projects afterwards saw that the projects had had a positive impact to business development. • Interviews and desk material suggest that the enterprise projects were well connected to internationalization activities for the companies and networking of researchers and top management has increased. • Within Tekes-funded projects, a shift has taken place from purely technological projects and product-centric R&D to general business development with the purpose of increasing competitiveness in the market. • Most of the research projects have developed frameworks, tools and models for SMEs. However, not all models have been utilized or the utilization has been in the hands of few interested people in those companies that participate.

▶

Serve	• Many interviewed participant companies state that the projects funded by Serve have set a basis for thinking in terms of services in their business, even though some aspects of the projects were not fully realized. • Serve created a service research landscape in Finland. Most of the research groups created during the programme are still operating. Service research entered the Finnish research agenda and international "gurus" became connected to Finland. • According to the data from research projects and researchers, most of the research projects funded from Serve involved relatively pragmatic knowledge, data and suggestions for wider use. • Key research groups have had heavy involvement with international and Nordic research, as well as with companies. The Finnish Service Alliance is a good sample result from the Serve programme. • Many of the interviewees see that Serve has had an impact on Tekes' internal activities, i.e. being a pioneer for service thinking for other programmes.
Programme efficiency and administration	
Liito and Serve	• According to interviews, the coordination function was research oriented, but otherwise seemed important. Interviewed Tekes members wished that steering group would have a more decisive role with more concrete ideas for programme implementation. • Efficiency in Liito programme is reflected in that it was a wide-scale and non-sectoral programme and brought new type of clients for Tekes in a rather efficient way, even though it could have been even better. • Serve had an exceptionally active steering group. Most of the members participated in the steering group work all the time, they acted as "promotors" in their own organizations, participated in creating the programme strategy and goals and also supported programme services as experts in different seminars and activation work. • In the interviews and in the secondary material the programme services and administration is considered quite efficient in overall. Serve programme coordination and management seem to have functioned well. Especially roadmaps and international cooperation are seen very effective and have also had implications for the programme strategy. • The activity of coordination functions had its downside in terms of diminishing the role of programme team and also in the fact that a lot of activity remains on the coordination function.

4.1 Target groups and their involvement

Liito

The Liito programme had a very active communication strategy both in terms of activation for enterprises and research organizations and regarding media. According to monitoring data from the communication service provider for the programme, around 30 Liito-related publications were released in key business media outlets such as Kauppalehti, Talouselämä, Taloussanomat, Tekniikka & Talous, Fakta. (Tekes, Cocomms).

The programme monitoring data shows that many activities aimed to reach both CEO-level and other levels of programme participants. In the interview, it is pointed out that Liito introduced a new target group for Tekes from within the companies. Tekes was more used to communicating with technology leaders than CEO-level members of the companies. Some interviews point out, however, that the real visits to companies were not active enough in contrast to other types of activation measures, such as round tables. Practically, this means fieldwork and visits to potential participation companies.

Many interviewees point out that the programme's weakness relating to reaching the target group was the general nature of the programme and lack of specific target sectors. The "new type of client group" is also reflected in the programme implementation, and without client and contact lists, the activation work was rather challenging. A more specific sectoral approach would have helped in contacting. For example, growth-seeking SMEs could have been a more optimal target group, but these were to some extent absent from the programme.

Many interviews point out that projects were more successful for those companies that were involved in the research projects and in their own projects, but the overall reach of the programme was relatively limited.

Serve

Based on the internal reports and memoranda of the steering group, before 2009, the number of new company projects that applied for the programme was at a satisfactory level. At the beginning of 2009, however, the group became worried of the relatively low number of new enterprise projects and the growing average time spent planning a pro-

ject. At the same time many of the incoming applications were seen as overly generic or vague. This led to discussions about new strategies in the event that the number of projects and contacts would keep falling. However, at the end of the year, it was stated that regardless of the increased standards for applying, the development of the project portfolio was at a good level.

A year later, it was noted that the number of projects in the fields of energy and environment remained low. However, it is likely that some of the service side project themes in these fields also directly apply to other Tekes' programmes (such as Vesi, Kestävä yhdyskunta and Groove), which decreased interest towards Serve. Also, in 2010, the number of different events was significantly higher than it had been in 2009. Although the quality of the events was assessed as high in relation to the set goals, the events struggled to reach the target groups – pioneering companies. (Steering group memorandums).

The Serve programme, hence, engaged in an extensive amount of enterprise contacting and activation. Many interviewees point out that the overall client reach was quite extensive. There were several subsectors that Serve aimed to reach. Based on the interviews and project participants, the KIBS sector was reached well as well as the industry sector. In terms of industry different types of industrial services were involved in several projects. Many assess that those companies involved have been forerunners in developing service business.

In term of retail, logistics and finance services the reach was not as good. In retail the consumer retail was not so well reached, but technical retail was quite involved in the programme and the idea of solutions selling and services increased drastically among the actors during Serve. The absence of consumer trade has been explained by the oligopoly situation and by the fact that consumer trade does not traditionally think of R&D investment as a separate cost. In logistics, the target group was not really reached and the sector was eventually left out of the programme strategy. Finance services were also not involved in the programme even though it was anticipated.

An example of the impacts of this drawback is that e-commerce is still underdeveloped in Finland and small companies targeting international markets do not have opportunities to develop it by themselves without the mass of large companies. Some also point out that non-traditional Tekes sectors were difficult to activate, because in discussions and their decisions in Serve, Tekes was still focused on industry and international export-led business. This posed challenges for the involvement of the retail sector, for example.

In general, the programme had difficulties in reaching some of the target fields or industries. One reason for this seems to be that there were several different funding programmes for the companies in these fields to choose from.

4.2 Relevance, target setting and objectives

Liito

Liito had several objectives. It was the first programme of its nature in Tekes. Most notably, at the time of its launch, it was the first programme in which Tekes funded the development of sales activities as reflected in official communications. (Tekes, communication 14.6.2007).

As noted in the final report of the programme, according to the self-evaluation of the steering group, the programme's strategic goals were relevant and ambitious. The need to focus on communication and results-dissemination activities was recognised. Some of the goals, i.e. international growth, new innovations in business models, increase in competitiveness and renewal were seen as being rather over-ambitious and had mediocre success. At the time, the key challenge how networking could be carried out on a more concrete level and how to better integrate enterprises into the research project design phase. (Tekes, 2001, p. 20).

Most of the interviewees see the programme as very relevant one in terms of introducing a more networked view of innovation processes in contrast to earlier technological programmes and in introducing, for the first time, a clear connection to comprehensive business development and market viewpoint to Tekes-funded development programmes. Similarly, the programme was seen relevant in focusing Tekes' activities on business model innovation and business development for the first time – "first class innovation in innovation funding", and in introducing a more business-centric approach inside Tekes.

From research perspective, Liito has been both a relevant and a significant programme. The Academy of Finland organized research programmes for business development (Annex 2) at the same time, and Liito made continuity towards these research themes. Liito was also the first programme that made it possible for business schools to really participate in Tekes' research funding programmes. For many commentators, this has led to an increase in business research alongside technological research both in terms of Tekes funding and to some extent in terms of actual research practices in the universities.

The theme was especially relevant because it implicitly meant that the enterprises started to think that both technological and business research constitute research. Many have commented that research is less solely technology-oriented.

However, the lack of focus within the programmes is also a challenge for their relevance. It is likely that not all the needs were addressed, and some sectors where business model innovation and business capability development would have been important were left outside the scope of the programme. This risk was already recognized at the planning stage. (Tekes 2004).

Figure 4. Illustration of ended research projects.

The project types implemented by research institutes (HEIs and governmental research institutes)
(Note: may include duplicates of projects, if announced by more than one partner)

Serve (N = 116)	53%	27%	7%	10%	3%
Muoto (N = 31)	26%	10%	65%		
Liito (N = 123)	57%	17%	4%	22%	

- ■ Applied research
- ■ Strategic research
- ■ The preparation of the commercialization of reseach results
- ■ Long / medium long term research
- ■ Connected research with the industry
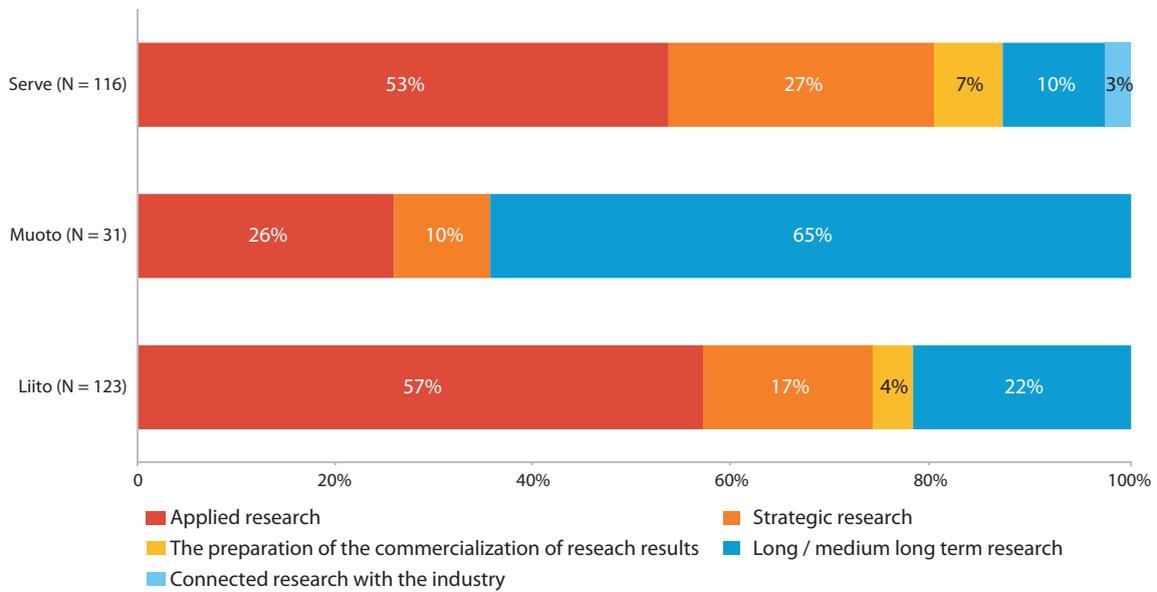
Serve

Almost all of the interviewees see Serve as having been a very relevant programme at the time. Most point out that it was also a forerunner programme in itself. This can also be seen in the fact that it was internationally a rather unique programme, meaning that good benchmarks are hard to find.

However, due to the programme's long duration and very wide scope, the picture of its relevance is rather blurred. According to interviews some of the relevant themes were somewhat absent at the beginning of the programme. An example of such a theme is digitalization, which was a more important driver during the programme than originally envisaged. As a programme, Serve was very business-centric, which sometimes was also its burden. However it should be noted, that before 2005 Tekes was very technology-centric funding and at the time "digitalization" was understood in very technological way. Thus it was conscious choice not to emphasize the theme in the beginning of the programme.

The need for Serve is characterised by the old-fashioned understanding of services within Tekes and within other funders at the beginning of the programme. According to many interviewees, the first discussions underestimated the role of services, or services were thought to be low-added value services. This meant that the Serve programme had also a role of an "evangelista" in a sense, both in the national innovation policy landscape and in-

side Tekes. For those commenting from the outside, the first years of the programme seemed to be more of marketing the idea inside Tekes. It was seen as almost too much of a forerunner. However, according to many, Serve also had an impact on how Tekes viewed its role in developing service innovation.

As pointed out in the context story, the Serve programme was implemented during the general service business hype. The role of research projects was extremely relevant and important: they conceptualised service business development for companies as well as the value of services, etc.

A question that arose in a few interviews is that of whether Finland was ready to take all of what Liito and Serve had to offer or if they were perhaps too forerunning. This means that they have perhaps left a gap for public intervention after their closing. The programme (this applies to Liito as well) was difficult to understand for those not involved, and sometimes the differences between Liito and Serve were difficult to point out.

The target setting and objectives of Serve were seen as rather ambitious in the interviews. In 2012, it was stated that out of the objectives of Serve, internationally known and profitably growing service companies and internationally attracting service markets are the two objectives that still require the most actions. During the programme, there was a lot of discussion on the topic of pioneering and what it actually means. For example, there were some concerns

about whether SMEs could be pioneers. In addition, there were some concerns that the theme would drive away companies in the provinces of Finland. (steering group memorandums).

According to most interviews, the target setting was also extremely challenging and not all targets were met. However, it should be noted that unlike other programmes, Serve created an internal programme strategy and programme metrics that were used to steer the programme, as well as to guide which kinds of projects should be financed.

Some interviewees commented that the internal mission of the programmes should have be more explicitly stated than it was in Serve. Some also comment that it did not work out as well as it could have. Many point out that too much burden was placed on the shoulders of the programme manager and coordinators.

Comparative remarks on resilience

One of the evaluation questions on the resilience of programmes and their objectives was tackled in interviews and desk research. A major point raised by many was that the programmes in and of themselves were quite resilient to changes in the operative environment. This is characterised by the refocusing of activation measures to the sectors more interested in being forerunners, adaption of the programme strategies, and different interpretations of the programme goals.

Some point out that the programmes were even too resilient in terms of internal change, and that changes in key personnel on the programme and / or coordination teams also led to refocusing of the work. Due to their non-sector focus and wide themes, it is obvious that the programmes were in their very nature resilient programmes rather than focused and closed ones.

4.3 Key results from Serve

When the programme ended in 2014, Tekes identified the following results: 1) innovative service business models and concepts have been developed. Profitability-growing service companies have emerged with positive impacts on service markets as a whole; 2) internationally recognized, high-level research in services and service innovations have been strengthened. (Koskela and Salminen 2014).

For Enterprises

In terms of service business, the results have been quite wide reaching. There is quite an extensive collection of success stories (presented in different publications) that have benefited from the programme in the long term. Many interviewed participant companies state that the projects funded by Serve have set a basis for thinking in terms of services in their business, even though some aspects of the projects were not fully realised.

Many of the projects concerned testing concepts and developing service design, and their full impact has taken place after the programme. In addition, many concrete results of the projects concerning, for example, client experience, service design and service business within traditional companies, have evolved over time and become realized sometime after the project has ended.

Based on the questionnaires carried out by Tekes, in 95% of the projects, the new solutions were created to some extent in network cooperation (Paavola 2014). According to Serve questionnaire made to Serve's company projects at the last year of the programme, 81% of the companies estimated that the project created through Serve funding had had a major impact on the development of the company's business. However, at the same time, 41% of the respondents noted that they would have implemented the project with or without Tekes' funding anyway. Serve funding only allowed them to carry out the project on a larger scale and with more external experts. 98% of the companies were, nevertheless, satisfied with Serve's services. 38% were, furthermore, very satisfied. (Tekes questionnaire for enterprises).

Many examples demonstrate a large growth effect of Serve companies. Introducing a new business logic to Finnish companies, which was one of the expected results, was not perhaps that well rooted for most of the related projects. For some companies, the programme has meant a drastic change in their business approach towards being more service oriented. The key point is that Serve projects have influenced the mind sets of the companies even more than the actual business at the time of implementation. Digitalization has been the other key driver to support this change. This observation seems to be valid for almost all of those sectors that were involved in Serve.

Case illustration: **Rautakesko – initiating the service thinking**

Rautakesko participated in the Serve programme with a project that introduced the idea of services in a hardware store business. This was a completely new type of thinking in a very traditional business characterised by very little business development in the past years. The company had a partner that brought the idea of the possibilities of new business and was the main initiator of the project. The company therefore had the idea of developing service business even prior to the Serve programme. Participating in the programme brought credibility and visibility to the project internally.

In the project, the company analyzed changing client needs and modelled different service concepts for vendors. A new concept of hardware stores selling entire solutions instead of hardware was revolutionary in the business. Solutions were created around energy efficiency, which was seen as a lucrative and growing market segment in which the company had not previously participated. This was realised with the help of a new partner strongly present in the energy efficiency business. The company succeeded in introducing solution sales in some of their stores, even internationally. However, the concept was fully adopted only in a few stores, which was remarkably fewer than the company had planned. The concept is used to some extent in many stores.

In hindsight, it can be stated that Rautakesko's business model of having independent hardware vendors posed a major challenge for implementing the service business concept. These challenges were underestimated in the beginning of the project. The company put effort into training vendors as well as sales people. The adoption of service business is, in fact, heavily dependent on the interests of the vendor, which was underestimated in the project. However, the company has a number of stores where the new concept was adopted successfully. Additionally, the concept was adopted successfully in some stores in Estonia and Latvia. On a wider scale, the project initiated, for the first time, a service business mind set in the company.

The company had ambitious targets for service sales. These targets were not reached, and the share of service sales varies greatly among stores. It could be argued that service sales have most potential in large cities. Despite this, the initiation impact of the project has been seen as important. ◀

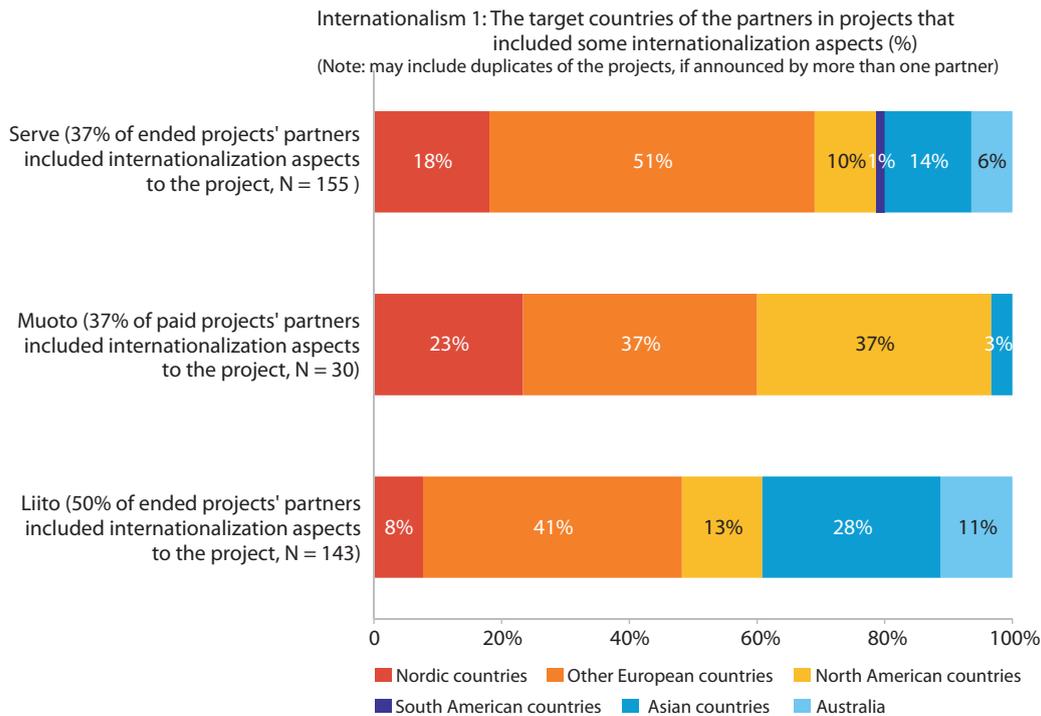## Case illustration: **Kemppi – Change of business with the projects**

The company had two projects in Serve, one defining the company's service business concept and other for creating a new concept of leasing welding capacity. The year 2008 marked a change in the company's product development strategy, as traditional product development and service business functions were merged. The company had participated in the BestServ programme hosted by Tecnology Industry and Tekes, which was the initiator impact to start developing service business. The projects in Serve were unique for the company in the sense that they created more systematic development activity for the company.

The service business concept project aimed at developing, at the time, a completely new service business concept and models for service business for the company. The purpose of the project was to get a good kick-start for major service business development in the company, as services had previously played a less important role in the company. The importance of service business was underlined by dedicating an important number of employees to service business development only. The project involved several partners, which had the role of carrying out market research and sparring the company in its service business development.

The service business has developed greatly since those times. Today, services make up an important share of the company's business and their volume has tripled since 2008, although the company had set even higher targets for service business when initiating the projects. The service business unit still exists today and employs some 35 people, compared to three in 2008.

The other project aimed at developing a new business model for leasing welding capacity was not as successful as the service business concept project. The main reason was the economic downturn in 2008, which had a huge impact on many businesses and sectors. The company was able to create a new concept for new type of business that can be launched later. The partnerships created between the company and partner organizations were valuable and still exist today. ◀

Figure 5. Illustration of the international aspect of the projects.

Internationalism 1: The target countries of the partners in projects that
included some internationalization aspects (%)
(Note: may include duplicates of the projects, if announced by more than one partner)

	Nordic countries	Other European countries	North American countries	South American countries	Asian countries	Australia
Serve (37% of ended projects' partners included internationalization aspects to the project, N = 155)	18%	51%	10%	1%	14%	6%
Muoto (37% of paid projects' partners included internationalization aspects to the project, N = 30)	23%	37%	37%			3%
Liito (50% of ended projects' partners included internationalization aspects to the project, N = 143)	8%	41%	13%		28%	11%

0   20%   40%   60%   80%   100%

Legend:
- Nordic countries
- Other European countries
- North American countries
- South American countries
- Asian countries
- Australia

A few case examples that were selected were not so successful. Some of these did not obtain any meaningful results. These projects dealt mainly with digitalization of core business, where the challenge seems to be the balance between tailoring digitalized service concept for the company and choosing between the right existing ones. The sample projects analysed in this regard, too, have been almost too forerunning projects.

One interesting aspect that was not so fully met was internationalization. Although many projects included the international aspect, it was not so evident and focused very much on Europe and Nordic countries in Serve, as can be seen in Figure 5.

▶ Case illustration: **Tammermatic Oy – From industrial business to service business**

Tammermatic's development project included three different entities inside the house. The first was an R&D effort to create a new-generation washing machine. The product created as a result was introduced first in Germany in 2012, and it has later fully replaced the older washing machines in production. The project allowed the company to capture new features in the machines that no competitor had, which has brought the company a new competitive advantage.

The second entity was attached to customer service, with the creation of a new service concept called the dividend machine (*osinkokonekonsepti*). The concept renewed the pricing mechanism of the washing machines in such a way that a fixed charge now covers the entire service, from the machine to chemicals and maintenance. The service concept was launched on the Finnish market and its success has been viewed very positively inside the company. However, it has been noted that from the customer's side, the benefit of the concept would have been higher in times of high interest rates.

The third entity of the development project has been the renewal of the production concept. This entity has included some actions, but it has not yet been as successful as the other entities.

Tekes' funding from the Serve programme was considered central to the implementation of the project. It was stated that the developed themes were crucial for the company's continuation in the competitive market. Tammermatic also has experience from other Tekes programmes both before and after the Serve programme. The products and concepts created through Serve have now become part of daily business, and future development projects especially touch on the topic of internationalization and export of both the machines and service concepts. ◀

Case Illustration: **Rautaruukki Oyj – The dynamic techno-economic methods for capacity control in a capital-intensive industry**

In 2006, the company Rautaruukki lived in times of high demand and full use of its capacity. In this context, the development project aimed to optimize the use of its capacity by improving its maintenance planning. The company applied for Serve funding due to the large scale and costs of the programme as well as due to the opportunity the programme provided for the company to purchase outside expert services. Rautaruukki had some earlier Tekes experience from R&D projects, but not on the maintenance side.

In practice, the project first observed the problem of capacity use and assessed the linkages between the machines and different material flows. This then led to the development of a mathematical model to forecast the fouling of production machines. The created stimulation model allowed the company to better predict the need for maintenance and decrease maintenance-related disturbances.

The created stimulation model has been in use in the company since the end of the Serve programme, though these days, ten years after the start of the project, there are also other methods in use. The project has been viewed as successful; however, its impacts have not been very extensive in an economical sense. This limitation of the project success has been, first and foremost, due to the market crash in 2009, which has generally led to times of overcapacity among the companies in the market.

In addition to the funding, the project formed a group of enterprises tackling similar issues. This was found to be very insightful, as it provided a viewpoint and information from other companies that are also creating methods for capacity control but are not direct competitors. ◀

Based on the innovation survey carried out by every second year by Statistics Finland, the share of service sector companies launching service innovations has been stable around one fifth of all service sector companies. It is interesting to notice that during the time Serve was ongoing, this share in financial and insurance activities has been between 30% and 50% (in 2008–2012). There has clearly been interest for service innovations within financial and insurance activities but for some reason Serve did not succeed to reach financial and insurance companies within its sphere of influence.

Whereas the share of industrial companies, strongly present in Serve, has been stable and low, around 14 %.

For the research landscape

According to the research projects' self-evaluations, 96% of the public research projects funded through Serve create results that are beneficial to companies. At the same time, the research projects wished that the demands for network cooperation would be lowered. (Serve 2013, results from project survey).

First of all, Serve created a service research landscape in Finland. Most of the research groups created during the programme are still operating. Service research entered the Finnish research agenda and international "gurus" became connected to Finland. Finland became a relevant player in international service research. The Serve programme also networked the Finnish service research community in a new way. Some permanent platforms have been created, such as the Finnish Service Alliance. Research activity has drastically increased, which can be seen after the fact in the regional seminars on service research.

According to data from research projects and researchers, most of the research projects funded from Serve involved relatively pragmatic knowledge, data and suggestions for wider use. Another result was that towards the end of the Serve programme, Finland was considered one of the leading countries in service research, which could be seen in the EPISIS project as well as in the citation impact of the service researchers.

Key research groups have had heavy involvement with international and Nordic research, as well as with companies. The Finnish Service Alliance is a good sample result from the Serve programme. New knowledge was created on how to successfully implement a service approach in traditional industrial organizations. Dissemination has been done afterwards, with universities integrating some publications into their teaching material (such as the *Rajatonta rohkeutta* book, cases, etc.)

For Tekes

Many of the interviewees see that Serve has had an impact on Tekes' internal activities, i.e. being a pioneer for service thinking for other programmes. Many of Serve's forums, such as the "BestServ forum", have remained very active after the programme.

At the same time with Serve, the wider societal discussion on the importance of services has been quite clear. The role of services and service innovations has risen to become one of the most promising themes for future business. Many give at least some credit to the Serve programme for raising these themes and making them part of the discussion. Some point out that big companies nowadays continuously report on notions of services in their business in order to demonstrate their role as "forerunners".

4.4 Key results from Liito

For enterprises

At the time of the midterm evaluation, enterprises involved with Liito mentioned that the projects had resulted especially in new processes and new operational practices, business and research collaboration networks, new capabilities and competencies and new business opportunities. In addition, enterprises involved with the programme mentioned that the projects have resulted new partnerships between research organizations or development of the current network relationships. (Tekes 2008, p. 20).

> ### Case illustration: **Kalevala Koru Oy – The renewed export business concept**
>
> The company had long tried to increase its exports to the international markets, and their sister brand Lapponia Jewellery already had a successful export history. The Liito project focused on renewing the business model, providing juridical advice, modernisation of digital tools and building up the logistics chain. As its outcome, the project led to Kalevala Koru creating a digital marketing, sales and logistics business concept in order to reach customers. ◄

Almost all persons interviewed from the projects afterwards see that the projects had a positive impact on business development. This observation is similar to that raised directly after the programme. In their mid-term evaluations, too, enterprises who responded to the Tekes survey mentioned that the project had strategic importance in relation to the company's future and that the developed subjects would not otherwise have been developed (Tekes 2008, p. 23).

Interviews and earlier desk material suggest that the Liito enterprise projects were well connected to internationalization activities for the companies. A few case illustrations will be presented later.

According to the mid-term evaluation, the networking of researchers and top management has increased. Interesting examples are the Startmark, Myyntihanke and Creawell projects, where the top management of each have been proactive. The Liito programme also hosted round table discussions and thematic working groups. (Tekes 2008). However, many of these practices were not continued after the programme.

For Tekes

Within Tekes-funded projects, a shift has taken place from purely technological projects and product-centric R&D to general business development with the purpose of increasing competitiveness on the market. The target group of the programme was at the same time very wide and challenging to reach. Traditionally technologically focused companies were not used to investing in R&D targeted at developing "only" business models or new markets. To get these companies used to use such public funding was an important result as such. As noted in the final report, the business capabilities were defined in Tekes as a horizontal team and led also to the establishment of new competence centres around it inside Tekes (Tekes 2011). Making Tekes known in the entire Finnish business sector, not only within technology and R&D intensive companies, and widening the target group of Tekes-funded projects to encompass the entire Finnish business sector was a result in itself.
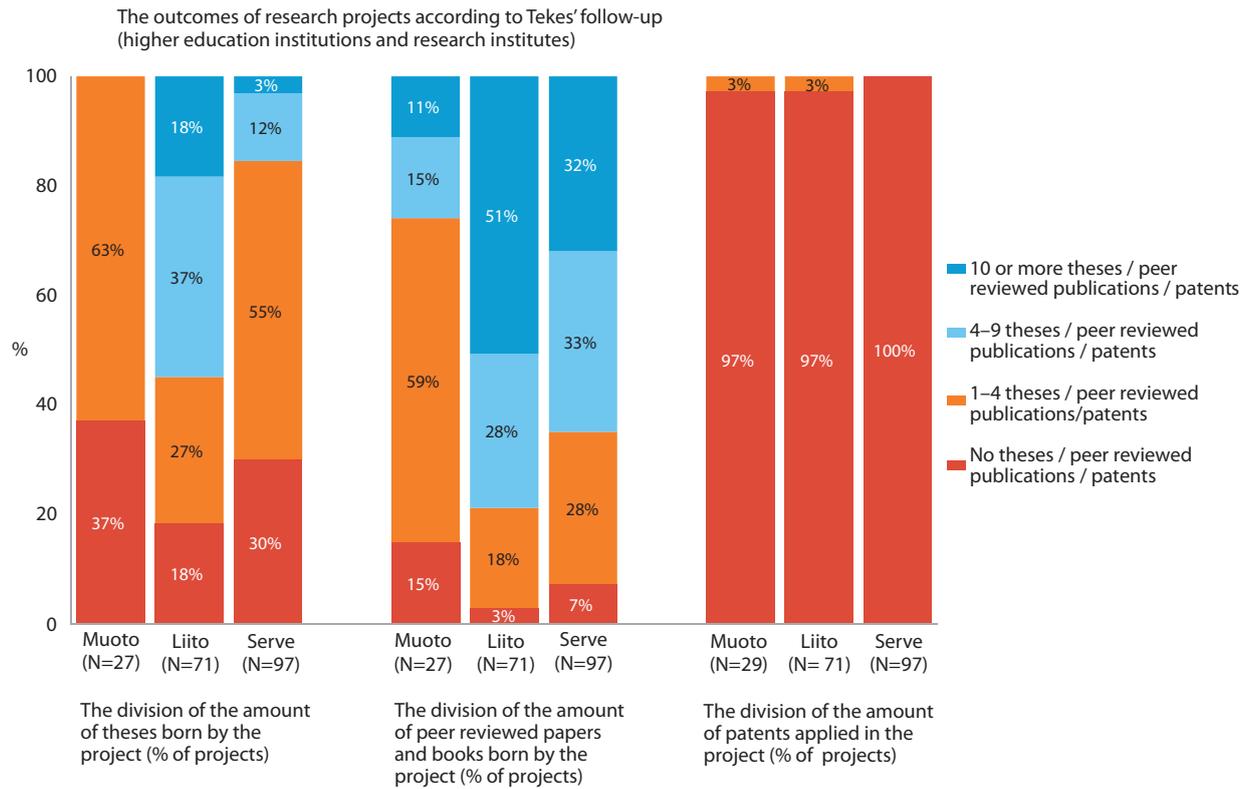
Most of the projects demonstrated the opening of a new kind of collaboration not only between Tekes and companies but also between research organizations and companies. There were many extremely innovative projects realised within Liito, such as the Myynti and K2 projects, which focused on new ways of selling. The programme increased collaboration between business researchers as well as between researchers and business, and created many joint projects. Researchers and research groups are now well networked outside the capital.

According to the cases and other interviews, the programme succeeded in creating networks of companies, which has ensured a wider and more comprehensive impact of funded projects compared to projects realized by one company only. An example of these are projects in the field of standardisation (i.e. real-time economy), which increased companies' opportunities to affect standardisation work. This would not have been in the interest of single companies. Some interviews point out that without certain Liito projects, no research investment would have been made in combining advanced market research with the development of the business management capacity of the participant companies.

On research landscape

Most of the research projects have developed frameworks, tools and models for SMEs. However, not all models have been utilized or the utilization has been in the hands of few interested people in those companies that participated. Networking seminars among researchers were seen as extremely important. The research projects in themselves were also very active in terms of publications and theses and Liito was the most active in this respect (see Figure 6).

Figure 6. Outcomes of research projects based on Tekes' follow-up data.

The outcomes of research projects according to Tekes' follow-up
(higher education institutions and research institutes)

Legend:
- 10 or more theses / peer reviewed publications / patents
- 4–9 theses / peer reviewed publications / patents
- 1–4 theses / peer reviewed publications/patents
- No theses / peer reviewed publications / patents

The division of the amount of theses born by the project (% of projects)

	Muoto (N=27)	Liito (N=71)	Serve (N=97)
10 or more		18%	3%
4–9		37%	12%
1–4	63%	27%	55%
No	37%	18%	30%

The division of the amount of peer reviewed papers and books born by the project (% of projects)

	Muoto (N=27)	Liito (N=71)	Serve (N=97)
10 or more	11%	51%	32%
4–9	15%	28%	33%
1–4	59%	18%	28%
No	15%	3%	7%

The division of the amount of patents applied in the project (% of projects)

	Muoto (N=29)	Liito (N=71)	Serve (N=97)
1–4	3%	3%	
No	97%	97%	100%

Many interviewees point out that business management capability development in Liito programme was more concrete than in other instruments, such as the Academy. However, many point out that the content of research projects was not then exactly what the goal statements implied – it was more practical and applicable research than "international top-level research".

Many interviewees have pointed out that many frameworks, tools and working methods included in the Liito programme remained at a conceptual level in those projects that dealt with leadership or different kinds of process management.

Case illustration: **Sandvik Mining – and the over-theoretical research organization**
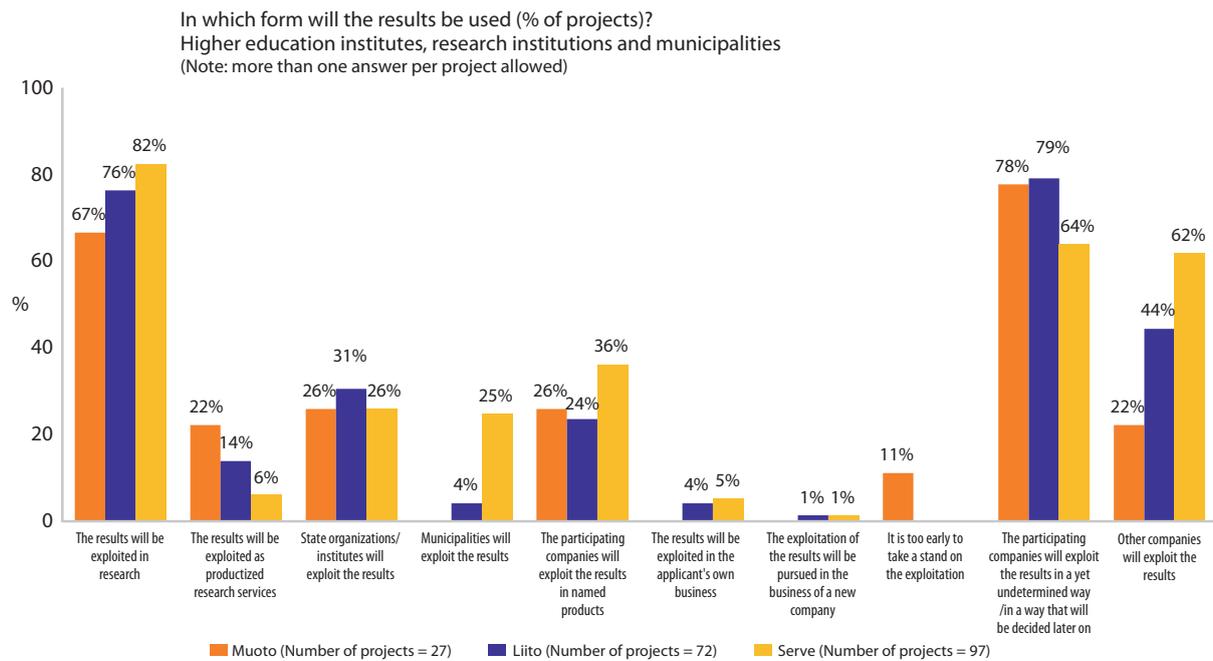
Sandvik Mining had a project on innovation management. The background for the project was organizational changes of 2006, when the company started to build an organization based on client segmentation. Organizational changes in connection to big growth in mining created an impetus for developing innovation processes and an innovation management concept.

The company was already an existing Tekes client and had extensive investment in R&D before the project. The need was to lead innovation management more systematically and to organize the innovation process. The project consisted of creating priorities for R&D&I processes. The State Technical Research centre VTT provided expert innovation management services.

Although the project was carried out and different models for innovation processes were produced, the overall results remained rather theoretical. Spin-off impacts from the project were quite good. There are two reasons behind the project challenge: the rest of the company environment and top-level management support for new processes were not fully met, and secondly the concepts used by research organizations were quite theoretical and difficult to link to the actual needs.

However, many of the concepts and ideas have influenced the capabilities of the core personnel dealing with R&D&I, and some ideas can later be seen in the company's technology strategy. Thus, the project created some basic work for future product development. Another lesson learned was that the company needs to challenge research organizations in a new way. ◀

Figure 7. Utilization of research project results.

In which form will the results be used (% of projects)?
Higher education institutes, research institutions and municipalities
(Note: more than one answer per project allowed)

Muoto (Number of projects = 27) Liito (Number of projects = 72) Serve (Number of projects = 97)

Serve had also the most wider applicable research projects from the analysed programmes. This is emphasized both in the interviews as well as in Tekes' follow-up surveys for the projects where more than half of the research projects had wider use for enterprises than just the participant companies, which is very typical use of the research results in the funded projects.

4.5 Influence of the programmes in national and international policy and strategy making

The evaluated programmes had impact on Tekes' internal working practices. Interviews point out that the importance of non-technological innovation can be seen in Tekes. Some point out that this is sometimes overestimated, since the project-based funding works better with technological development.

Many programmes have had new clients afterwards from the participants in these programmes. Especially research projects and groups have had continuity. Business thinking is evident both in programmes and used to be visible especially in the Strategic Centres for Science, Technology and Innovation SHOKs. This change happened partly because Tekes switched its thinking on services internally and also from the push from the forerunner technological clients.

All of the programmes, especially Serve had a high impact on the orientation of Tekes experts and Tekes strategy. According to Serve's steering group, an important impact of the programme has been the national change in the mind set of developing service business and the mind set change among Tekes experts. For example, Serve's score-card for pioneers has been later on the standing point for Tekes' customer profiling model. (Serve steering group memorandums).

Serve has been "copied", for example, in South Korea, Poland and Austria. In addition, several benchmarks have been done of the programme. (Serve steering group memorandums). Some interviews also point out that the so-called design ladder model, which is considered a Danish invention, was originally presented already in the Muoto programme.

According to interviews Serve has even had an impact on EU-level policies and concepts. This result (or impact) has been formed by the interaction of Serve and EPISIS and enforced by some active parties in Finland. The key impact has been funding of non-technological innovations in funding programmes such as Horizon 2020. Even though many similar aspects have led to the increased focus of services within these programmes.

However, it should be noted that the causality of the Serve is impossible to establish. At the same time, the themes on service business go a lot of attention based on the forerunners who participated in the programmes.

4.6 Programme administration and its efficiency

Liito

Steering group

The Liito programme focused its programme administration to steering group work and programme services. According to interviews, the coordination function was research oriented, but otherwise seemed important. It was important that someone had time to put the programme's agenda into the companies. Direct involvement with the companies was more important in Liito that in other programmes. The programme team and its activities were rather unclear to some steering group members.

During the evaluation the steering group members were rather hard to reach. Those who were reached mentioned that it was rather general and the use of steering group as an "Evangelista" did not work the same way as it did in Serve. Explanations are both the ad hoc nature of steering group meeting invitations and the background of steering group members. Also, interviewed Tekes members wished steering group to have a more decisive role, with more concrete ideas for programme implementation.

Programme services

Efficiency in Liito programme is reflected in that it was a wide-scale and non-sectoral programme and brought new type of clients for Tekes in a rather efficient way, even though it could have been even better. According to many interviews Liito programme had an impact in changing the mind sets of Tekes personnel responsible of funding decisions (also noted in Tekes 2011, s. 18). However, some interviews point out that the change has been much slower than anticipated.

Programme services focused especially in interaction between top-level business management and researches. The programme services included several concepts such as round table discussions, seminars and networking trips, guidebook for organizing networking trips and a web page for results (apparently not operational any more). Serve and Liike 2 programmes were implemented at the same time and shared programme services and seminars were offered. (Tekes 2011, s. 3).

Overall, the programme organized around 60 seminars, which reached over 3 000 participants (Tekes 2011). However, as mentioned earlier, due to the wide nature of the programme, many point out that the efficiency of the programme was not satisfactory in terms of target group reach. A notable viewpoint raised by many was that it was rather difficult to gather potential target groups.

Rather critical viewpoints have been in terms of reaching right company profile and company population. At the same time, it should be noted that many companies are not very innovative in this aspect (esp. management or marketing).

The overall assessment by project applicants has been that the programme services were quite appropriate but sometimes seemed too complex. The importance of seminars and roundtables were also questioned in terms of efficiency in contrast to more direct activation.

Serve

Steering group

Serve had an exceptionally active steering group. Most of the members participated in the steering group work all the time, they acted as Evangelista in their own organizations, participated in creating programme strategy and goals and also supported programme services as experts in different seminars and activation work.

The programme administration seems to have been very active and the steering group and the team have been seen seem as one of the success factors of the programme. For example, the work included a lot of pre-tasks before meetings. In general, it was noted that it is not very common for Tekes' programmes to get extended. The extended period of Serve programme was especially due to very well managed strategy and mid-term evaluation work. (Koskela and Salminen 2014 and steering group memorandums).

The connection between Serve and Liito programmes was well acknowledged by the team and it was also wished that the Serve programme could continue from where Liito ends to some level. In addition, it was estimated that Serve would inherit some of Liito's customers. The two programmes also had a common planning meeting. (steering group memorandums).

In 2010, the steering group itself estimated that it has succeeded well in its work. This was especially due to the orientation to the core things, the strategy and the capability to see the overall picture. Also, it was considered that the group has been active in its search for different and new perspectives to upcoming issues.

Programme services

The programme had a coordination project as well as the programme team and communication support. The programme services had some innovative concepts that were important at the time, such as morning brunches and a wide scale regional roadshow.

The activity of coordination functions had its downside in terms of diminishing the role of programme team and

also in the fact that lot of activity remains on the coordination function. The programme team also included communication resources, but most of the communicational activities have been newsletter and some campaign type of communication. Many interviews criticize that communicational activities should have been bigger and more drastic in contrast to original programme objectives.

As noted earlier, in 2010, company activation was started with more intensive approach. This activation was targeted especially to new fields such as forestry, chemical, energy and environmental industries. The activation was based on the lists of *Talouselämä 500* and *500+ challengers*. In addition, Tekes' questionnaires to companies were used in planning the target companies. Based on the experience of the lead, the activation campaign was perceived positively by companies. (Steering group memorandums).

In 2011, it was stated that the development of the project portfolio is satisfactory, but there is need to continue the activation campaign. At the same time, there were notions that the activation campaign had not resulted in an increase in the number of project applications. However, it was discussed that this was also potentially due to the fact that Tekes' practices had been changed the previous year. It should be noted that, there was a general decline in the demand for Tekes' funding in 2011. This decline was approximated to be about 20% and led to the decline of Serve's funding allocation. (Interviews and memorandums from steering group and programme team).

Based on a Tekes survey, the events organized by the programme have been seen quite successful with average scores from 3,5 to 4,5 (on a 1–5 scale). According to the survey, the best programme services were the personal guidance, business development support (with various guidebooks Serve produced) and to some extent the networking work. In general, programme services and seminars seem to be experiencing inflation within companies and to work better with research projects and researchers. Activities to support internationalization were not seen as important as the other measures.

In the interviews the programme services and administration is considered quite efficient in overall. Serve programme coordination and management seem to have functioned well. Especially roadmaps and international cooperation are seen very effective and also they have had implications for the programme strategy. During the implementation there were log of ambitions to reach the target group, but during the implementation some refocusing were done.

5
Impacts

SUMMARY

Key findings on the impacts	
Muoto	• The impact within the participating companies was realized through companies' in-house design professionals, which were gatekeepers for the promotion of design internally. • Many of the company projects did not have an international aspect and instead focused on making design a strategic tool on the home market. • Aims of the programme included also to increase the number of design consultancies and develop the design consultancy service offering. The number of design consultancies was small in the beginning of 2000s, and their service offering was also limited to some extent. • The number of design consultancies has more than doubled since 2001 and turnover development in the sector has been positive every year except for the year 2009. • The impact of the programme on research was profound. The aim of the programme was to support the creation of an established research cluster in the field of design with active partnerships with companies and international collaboration. • An important impact of the programme is that it yielded plenty of new research literature in the field of design. Many basic textbooks as well as works for business use were created by the research programmes. • International research collaboration was quite scarce and depended much on individual researchers.

Liito	• Liito demonstrated great potential for innovative business models.
	• At the level of individual cases several types of impacts can be demonstrated:
	  – Strategy work developed in Liito influenced the revision of product portfolio of a company and revised strategy. Led to an increased share of the turnover from domestic markets towards international markets as anticipated, although the actual turnover is at the same level in the beginning of the project. (Case examples: Artic Machine, Linkosuon Leipomo).
	  – Change in the way the company organized its inter-organizational development (Salomaa Yhtiöt).
	  – Creation of new types of metrics to steer business which are still in use and help in guiding business decisions (i.e. Salomaa Yhtiöt)
	• Due to the number of actual enterprise projects and the limitations of steering group reach, many interviewees point out that the overall impact was more limited than expected.
	• Liito has funded research projects more than enterprise projects. Those involved in programme management point out that the results should be measured only after the programmes.
	• In the longer term, one of the expected impacts was to strengthen the role of business research as part of the national innovation environment. According to interviews with research project participants and steering group members, Liito increased the use of business research and market research as part of the Tekes funding. Some interviewees pointed out that after Liito, market opportunities are now always considered in terms of traditional technology-focused R&D projects.
	• According interviews, Liito had a significant impact on establishing networks involving business and marketing research competencies and enterprises, which has led to several research teams and business-university collaboration practices after the programme.

5.1 Impacts from Muoto

Impact on enterprises

There were 48 companies participating in the programme in the form of a development project. Additionally, plenty of seminars were arranged within the programme to spread the word about the potential of design. According to the interviewees, the impact of Muoto on companies was less discernible than its impact on research. This was perhaps due to the fact that the programme reached mainly companies already aware of design and its potential. Targeting those already aware of design was a conscious choice of the programme. The idea was to spread the understanding of the potentials of design within business through these pioneering industrial companies.

The narrow target group was discussed in the mid-term evaluation of the programme and it was recommended to widen the target group in order to reach wider results. However, as Tekes lacked the tools needed at the time to attract companies beyond its traditional sphere of influence, the challenge could not be overcome by the latter part of the programme. Reaching companies was also a challenge because the scope was very wide, covering essentially the entire business sector in Finland.

At the time, Tekes' communication methods had not developed to the level where they are today, and the main cooperation partners were technology directors in companies. Given the strategic aspect of the programme, the main target group in companies should have been at the CEO level. Due to these challenges, the programme influenced quite a small number of companies, which were mainly already using design strategically. However, the power of the programme was channelled into creating leading examples within these pioneering companies, which could then use their own example to demonstrate the benefits of design. The programme succeeded in creating such leading examples, and these were communicated efficiently. As design became a visible part of some leading companies, this attracted other companies to explore the use of design. Metso was one of these leading examples. The company succeeded in creating a strong design unit, and with this, design reached a visible role in the company. Design also proved successful in business, as new products where design had an important role in product development were successful and increased the sales of the company remarkably.

Case illustration: **Metso – investing to user-centred design**

Metso has long been one of the leading Finnish industrial companies as regards the use of design. At the beginning of the millennium, the company was investing heavily in user-centred design. The company wanted to use design more widely in product development and to develop design competencies within the company in order to increase its competitiveness. The company's Muoto-affiliated project was Metso's first project related to design. The company had traditionally invested heavily in technology development, and Metso had already been collaborating with Tekes. Parallel to this project, Metso was part of a research project related to Muoto and it was, already at that time, planning and developing service businesses.

The Muoto-affiliated project encompassed research on user-centred design, usability plans and procedures, combined product and service pilots and development of a new modular paper machine concept and the brand image of the company. It employed a team of in-house designers as well as many partners and design consultants. The project also created guidelines on how design would be incorporated into the company's innovation processes. As a result of the project, the company gained first of all production-line-wide design concepts for design management.

Design was already an integral part of the company in the late 1990s. The importance of design grew remarkably in the beginning of the 2000s. Prior to the project, the company had a small design team of four in-house designers. Through the project, a few more designers were employed and the company established an in-house design centre to the municipality of Järvenpää. In-house design resources were important in the sense that they acted as internal change agents – a role a design consultant could not take. The lack of internal designers has been, at times, a major obstacle in the creation of design thinking within two other large industrial Finnish companies, Kone and ABB. A large in-house design team also ensured the continuity of design themes within the company and made sure that the use of design was not too heavily dependent on one single person – which is a risk in case of changes in personnel.

The importance of the Tekes project was that it brought credibility to design within the company. Without the presence of Tekes, the in-house designers would have needed to do more work in order to justify the need for the wide use of design within the company.

The company was able to bring several new products to the market that were created according to the principles of user-centred design.

There have been a couple of disruptions in the intensity of use and development of design within the company. These have had to do with changes in the top management. Commitment and support on the part of top management have been essential in building up design competence within Metso. The financial crisis led to cuts also in design functions, and the design centre in Järvenpää was closed down in 2014. Today, there is only one designer employed in Metso and a couple in Valmet, which recently broke away from Metso. In addition, design procurements have been cut to a great extent. Despite this regression, design is still an integral part of the company and the results of past year investments in design can still be seen today in the form of well-designed products and existing procedures. User-centred design continues to be strongly present in the company. ◄

Concerning companies that participated Muoto, many managed to benefit from the programme significantly (see some case examples below). According to the final report of the programme, the criteria set for the participating enterprises to include implementation and development procedures in their project was successful in that it increased the degree to which project results could be implemented. The impact within the participating companies was realized through companies' in-house design professionals, which were gatekeepers for the promotion of design internally. With the help of a specific design expert, the importance of design was communicated internally, including to the CEO level. Making design a strategic tool within the company requires a significant change of mind set, which can be very arduous especially if the idea of design is new in the company. Having a design manager gives visibility and credibility to the topic, and this makes the internal change of mind set easier. This change of thought is more difficult to realize if the company has dedicated design issues to external experts only. External experts lack the tools and possibility to influence company's internal culture. According to a member of the programme's steering group, during the first years of the new millennium, many companies had raised their design manager to a member of the executive group.

Muoto aimed to make design a competitive tool for Finnish companies in international competition. Many of the company projects lacked an international aspect and instead focused on making design a strategic tool on the home market. Using design strategically as a competitive tool and testing it first on the home market may be a wise strategic choice from the companies. Many of the compa-

nies have then succeeded in increasing their international sales. A case analysis of Levanto and Finn-Marin shows how design can have an important role in increasing the international sales of the company.

Case illustration: **Levanto – reforming the visual and brand image**

Established in the 1930s, Levanto manufactures diamond tools and provides related solutions. The company employs some 50 people in Finland, Sweden and Norway. The company underwent a management buy-out in the late 1990s. In 2007, the current management of the company decided to devote resources to reforming the company's visual and brand image in order to create a new, more modern image for a company that had long traditions and whose business was based on technically competitive products.

The objective of the development project was to reform the design of core drills as well as the visual image of the company, covering everything from products to marketing. The aim was that with a new image, the company's products would be differentiated clearly from competing products. The company would have carried out the reform even without participating in the Muoto programme but in that case, the reform would have been less profound. The company knew Tekes from previous collaboration and it felt Tekes' presence would be essential to succeed in a major reform.

The project resulted in completely new core drills that no competitor had at that time. In addition, a graphic manual was created to give guidelines regarding the company's visual image. Core drills are a lead product segment of the company and the product will be launched to a new foreign market this year. Participation in the Muoto programme turned design from an operational resource into a tactical resource in the company. ◄

Case Illustration: **Finn-Marin – shortening the design phase of a new product**

In the 1990s, Finn-Marin was a traditional shipbuilding company producing motor boats for the consumer market. Some one third of the company's production was exported. The approaching millennium made it evident for the company that it should heavily develop its business and especially product development in order to be able to benefit from the international growth of the business and to be able to bring new models to the market at a faster pace.

The company decided to design a 31-foot boat, which required extensive development of the design process as well as production processes. The company made a large investment in 2000 to shift away from very traditional, handicraft-based shipbuilding, and created production lines and efficient production facilities with measurable processes. Tekes was part of this project.

Good cooperation with Tekes led to another project, this time part of the Muoto programme. The objective of this project was to heavily develop the company's product development processes in order to shorten the design phase of a new product. In the project, the company rethought design, planning, electrical installation, lacquer finish, glazing and other essential phases of new product development. The company also started using 3D technology in its design. The project involved many partnering companies, which operated as subcontractors for the company. The project made design an essential part of product development and brought some Mediterranean style to the product selection, which had been characterised previously by traditional Nordic design.

The result of the project was a completely new type of 31-foot boat for the Finnish and international market. In addition, a new brand was created, albeit unintentionally. It was the first boat of this size on the Finnish boat market and the boat attracted plenty of media attention, also winning a couple of awards. Through the project, the company was able to cut half of its product development expenses as well as the timetable for the following product creation. Soon after this, the competitors of the company on the Finnish market started to put effort into product development as well. Finn-Marin was, however, the first company to heavily develop its business and it revolutionised the traditional shipbuilding sector in Finland.

After the project, during the years 2005–2007, the company's sales increased by some 50% a year. Workforce employed by company's products grew tenfold between 2000 and 2007 and exports doubled. Although the financial crisis led to letting go of the in-house R&D function, the company has been able to retain the share of exports at the peak year figures. The company employed many subcontractors and indirectly created over a hundred new jobs. In addition, one new start-up was created in shipbuilding. ◀

Aims of the programme included also to increase the number of design consultancies and develop the design consultancy service offering. The number of design consultancies was small in the beginning of 2000s, and their service offering was also limited to some extent. The programme aimed to create collaboration not only between these consultancies and companies benefiting from design, but also between design consultancies and the research sector.

Figure 8. Growth of design consultancy services (Statistics Finland, Register of Enterprises and establishment)**.**
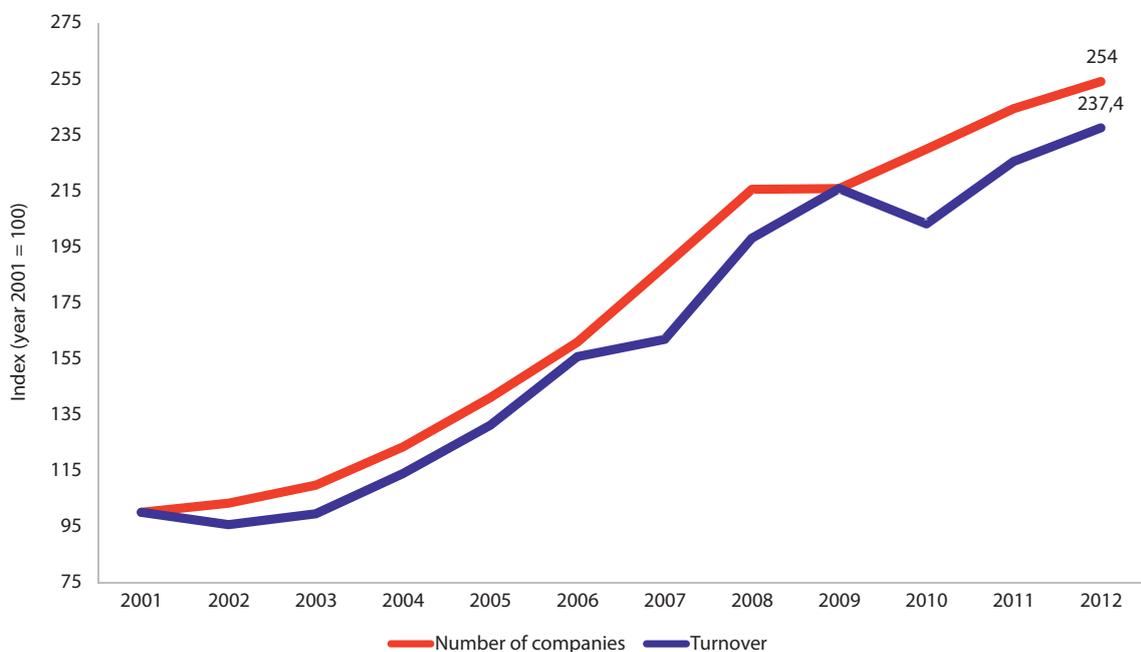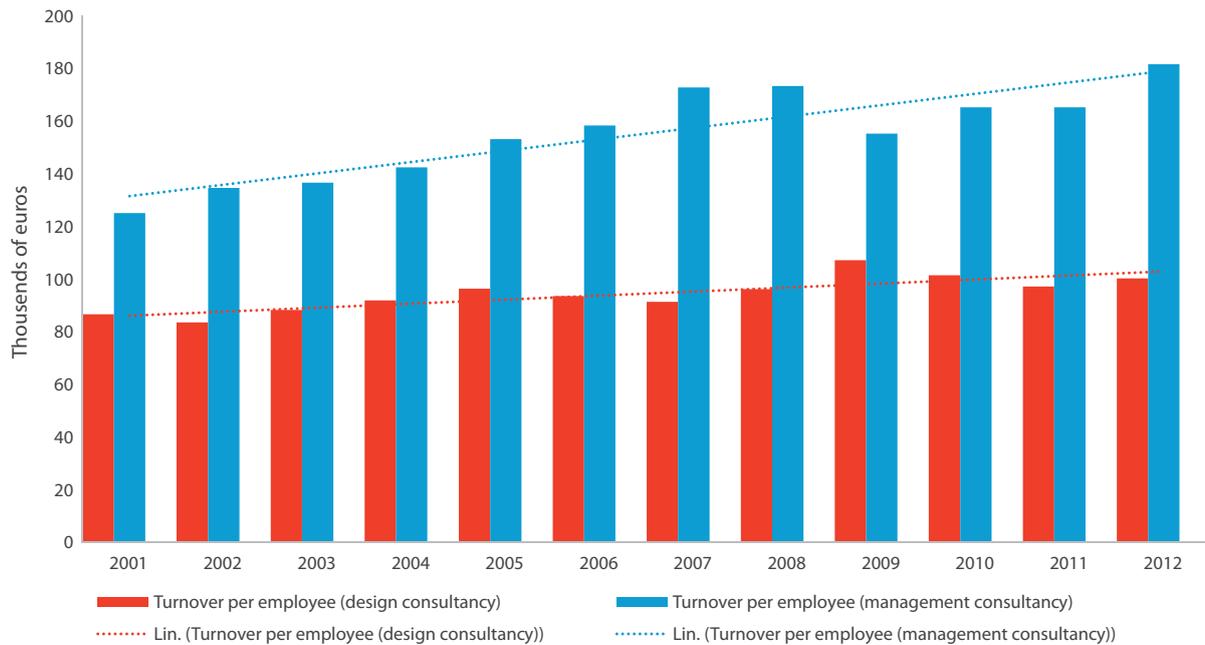
Figure 9. Turnover per employee in design and management consultancies.

Legend:
- Turnover per employee (design consultancy)
- Turnover per employee (management consultancy)
- Lin. (Turnover per employee (design consultancy))
- Lin. (Turnover per employee (management consultancy))

The number of design consultancies has more than doubled since 2001 and turnover development in the sector has been positive every year except for the year 2009 (specialised design activities in Standard Industrial Classification 2008). This development has not resulted in larger companies though as the average turnover per company has remained stable and still 99% of the companies in the sector employ less than 10 people. It is interesting to notice, though, that turnover growth has been slightly more rapid in small companies, employing less than 10 people compared to larger companies. Profitability has increased somewhat but not to a large extent. Regarding profitability, in turn, the growth has been highest among companies employing 10–49 people. Comparing this development to management consulting services, it is interesting to notice that as regards to the number of companies, design consultancies have grown relatively faster than management consultancies. When it comes to profitability of the business this tendency is the opposite with management consultancies having a higher growth rate for turnover per employee than design consultancies. (Statistics Finland, Register of Enterprises and Establishments).

There were eight design consultancies that had a development project in Muoto. Factors limiting the participation of design consultancies were that they were small and therefore resources to develop their business scarce. This challenge concerns all small companies related to the programme, not just design consultancies. Many small companies were not interested in participating in such a programme due to scarce resources for development.

However, changes in the entire field of design and business can be seen to have encouraged also these smaller companies to develop their business and benefit from design. For example, Pentagon Design, which was analysed as a case study in this evaluation, had a novel and innovative business idea that could not be turned into new business. The reasons for this were that the company lacked resources for marketing its business idea and could not turn its good idea into new business. For single small consultancies, these types of development projects may not be the best way to create new business. As the final report of the programme suggested, the development of the sector calls for new partnerships and collaboration networks, which enable adequate resources for development activities.

Case illustration: **Pentagon Design – obstacles in creating new business**

Pentagon Design is a design agency, which participated in the Muoto programme with two projects. One of these was a development project related to a new solution realized together with Taloustutkimus, a market research company, and the other was a group project realised with a few strategic clients of the company and a new partner. Pentagon design had a need to be able to visualize customer needs and interests. The idea was to be able to evaluate design-related needs and interests for different consumer groups based on research. The aim was to combine a consumer research framework

with design frameworks and to create a model that classifies consumers on basis of their values and interests. The model would have been incorporated into a marketable service for the clients of Pentagon Design and Taloustutkimus.

Despite a good idea and realization of that idea, the companies were not able to use it to create new business. The solution received interest but companies found it difficult to market it. Pentagon Design assesses that they were perhaps too early with their solution, as similar types of solutions have emerged later and they have gained success. Additionally, a small design agency has limited resources to put adequate effort into marketing something completely different and new compared to its usual service offering. However, the solution functioned as an internal tool in the company and was useful in that sense. Pentagon Design also gained new know-how and competences through the project. The project succeeded in building up a new strategic partnership between the companies and they have continued to engage in cooperation also in other projects.

The other project dealt with establishing a forum for few good clients of the company that were not competing in business in order to offer them a possibility to share ideas and to learn about foresight methods and test these in practise. The idea was to help the companies implement user-driven planning in their processes. The role of Pentagon was to to lead the group. However, the actual content of the project was planned by the companies and they themselves took care of the actual work in the project. The project was a completely new way for Pentagon Design to bring together companies that did not previously know each other. It was a pilot for testing a new type of service for Pentagon Design. ◀

Impact on research

The impact of Muoto on research was profound. The aim of the programme was to support the creation of an established research cluster in the field of design with active partnerships with companies and international collaboration. The programme was seen as a remarkable source of funding in the research sector and funding for design research increased sharply through the programme. The programme created new research networks within research institutions and between research and companies. All relevant design topics at the time were covered in the programme by research projects. The creation of Aalto University united creative and artistic fields with business and technology. Design was made one of the four spearhead fields in the new Aalto University and design was allocated remarkable resources in the new research community.

Those interviewed see that Muoto had its share in this development.

Prior to Muoto, design research was carried out in single small research projects. Now, design has become an established part of research. There are permanent design research units in several research institutes, such as Aalto University and the Institute of Design and Fine Art at Lahti University of Applied Sciences. In addition, the number of doctoral dissertations increased remarkably, bringing many new design topics under research that previously had not been researched. Muoto was important for enabling many doctoral candidates to accomplish their academic degree. However, the increase in funding was temporary, and those pursuing a doctorate were not able to stay within research units. Instead, they have since those times been employed in the business sector. This is seen in the research sector as a disadvantage, as research units are nowadays smaller than they used to be. On the other hand, flow from research into business has enabled a wider exchange of thoughts and the exploitation of research knowledge in the business context. Given the aims of the programme, this can be seen as a positive trend.
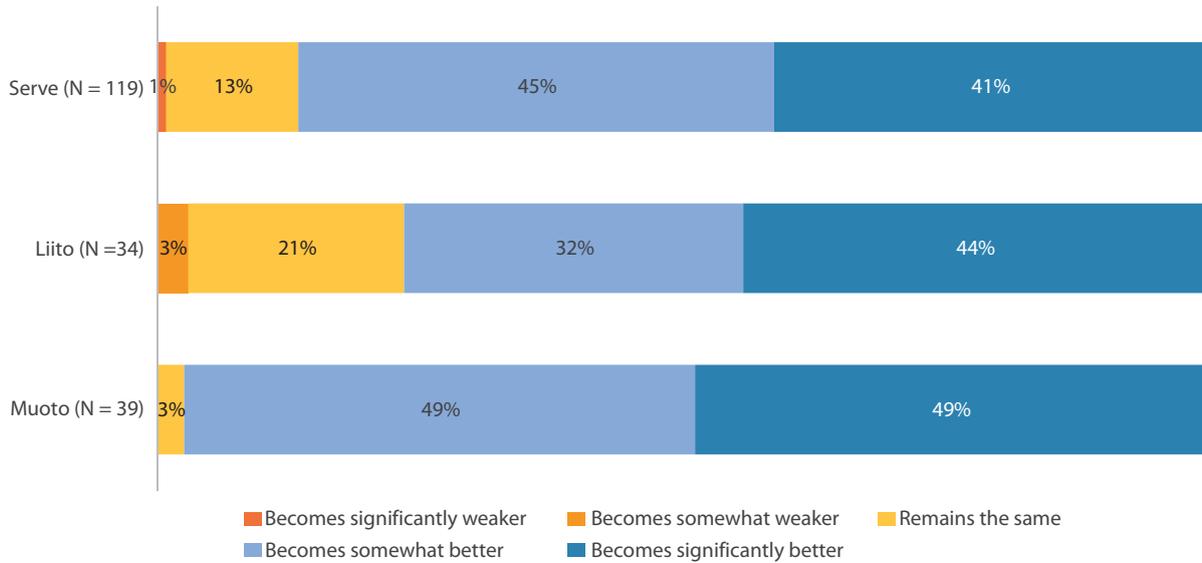
An important impact of the programme is that it yielded plenty of new research literature in the field of design. Many basic textbooks as well as works for business use were created by the research programmes. This literature is largely still in use and many of the works directed for business use have seen multiple editions.

Design education has also developed greatly due to increased research resources. Research results have been incorporated into basic design education and in this way have brought education forward. Design education at the university level is today much more research-based and less of the master-apprentice type than it used to be. Research units had good relations with companies also prior to the programme, but it encouraged some smaller companies to participate in research projects too.

International research collaboration was quite scarce and depended much on individual researchers. Some researchers had active collaboration with international fellows and organized events and seminars to support this. In general, the programme was seen not to have succeeded in creating significantly more new international partnerships, even though this was one of the priorities within research. The research projects, especially during the first half of the programme, did not include international aspects. The aim of the research projects was more to make design a competitive advantage on national level. As this weakness of the programme was lifted up by the mid-term evaluation report, research projects initiated in the latter half of the programme took internationalization better into account. Most of the research projects initiated in the second half of the programme were classified as important in an inter-

Figure 10. Project participants' view of the impact of the programme in altering their market position.

How is the project expected to alter the company's market position in relation to competitors?
(Tekes' follow-up questions for companies

| | Becomes significantly weaker | Becomes somewhat weaker | Remains the same |
| Becomes somewhat better | Becomes significantly better |

national context, whereas only some projects received this remark in the first half of the programme.

Participant companies also estimated in Muoto, that after the projects their competitive capability is better than other companies. This finding is similar with other programmes.

To conclude, it can be stated that the programme positively influenced the accumulation of competences in the design field and it helped to make the design research field more elaborate and useful for business. However, the general challenge of diffusing research results into business also affects Muoto, and work remains to be done concerning this.

5.2 Impacts from Liito

Impact on enterprises

One of the impacts expected in the final report (Tekes 2011, p. 7) was that in the longer term, the programme would create new competencies and capabilities to develop their competencies together with the Finnish research organizations and universities. According to many research projects, interviewed five years after the programme, the same enterprises included in the project are still in cooperation to some extent with the research organizations. However, the "new cooperation model" was not realized.
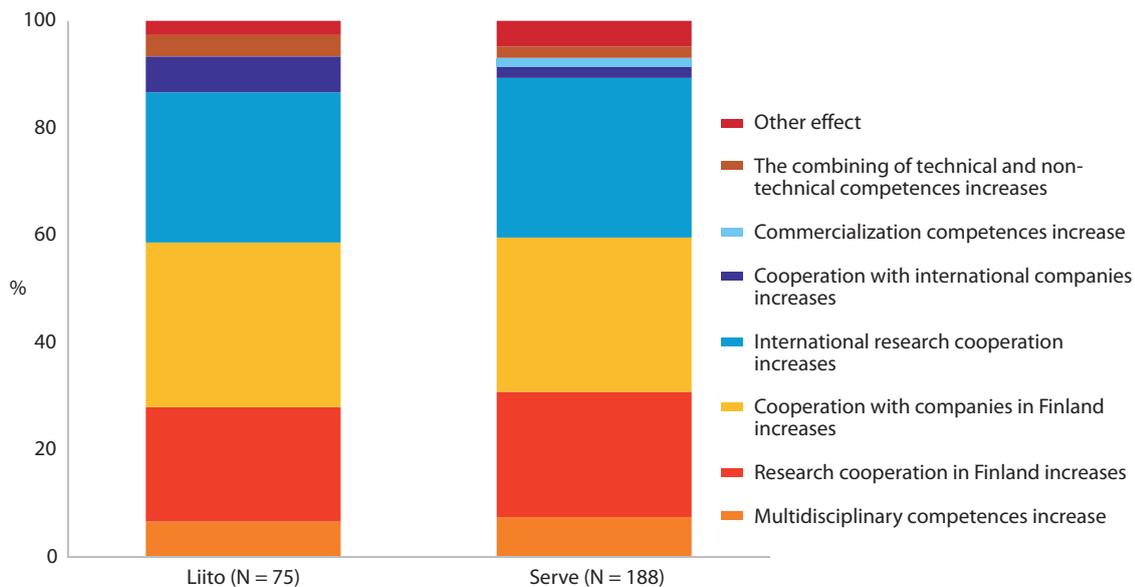
The same finding on increased collaboration between research organizations in the field and participant companies is reflected Tekes' own follow-up data where around 55% of both Liito (and Serve) participants saw the effect on domestic cooperation and around 30% saw the effect on international cooperation (see figure 11).

The case companies have developed several different aspects of their businesses after participating in the Liito programme. For example, in the cases of Arctic Machine and Linkosuon Leipomo, the strategy work developed in Liito influenced the revision of product portfolio and revised strategy. This also Led to an increased share of the turnover from domestic markets towards international markets as anticipated, although the actual turnover is at the same level in the beginning of the project.

In the cases of Salomaa Yhtiöt, a noted impact was a change in the way the company organized its inter-organizational development. In addition, there was a creation of new types of metrics to steer business which are still in use and help in guiding business decisions. Other impacts have been, for example, new international expert countries that were selected based on the strategies or analysis developed in the Liito programme (i.e. Artic Machine, Olvi), reorganization of the company's own product R&D and innovation activities (Olvi, Salomaa Yhtiöt), and an increase in the international sales and international growth or an increase in the share of international turnover from overall turnover (Olvi, Artic Machine, Linkosuon Leipomo).

Figure 11. Effects of the projects in Liito and Serve.

What kind of an effect does the project have on the applicant?
(Tekes' follow-up questions for HEIs and research institutes, multiple answers per project allowed)

Legend:
- Other effect
- The combining of technical and non-technical competences increases
- Commercialization competences increase
- Cooperation with international companies increases
- International research cooperation increases
- Cooperation with companies in Finland increases
- Research cooperation in Finland increases
- Multidisciplinary competences increase

X-axis: Liito (N = 75), Serve (N = 188)

Case Illustration: **Linkosuon Leipomo – internationalization project**

The traditional bakery from Tampere participated in Liito with a project related to internationalization. The project included analysis of potential international markets, approaches to internationalization and an internal development portion, which focused on revising the product portfolio of the bakery. Some of the initial plans for the project included thinking on a product prototype for "rye-chips" the technical production challenges of which were also tackled in the internal development portion.

The project was a success in that it met its objectives. The biggest impact was the competence in analysing international markets, which is still relevant after 5 years since the end of the project, and the specialization in dry-bakery products. This also meant a revision of the company strategy after the research project. Combining both market and internationalization analysis and the solving of technical challenges for the spearhead product was very important for the company. In a sense, the project had extensive impact in helping Linkosuon Leipomo to define what the company is today. ◄

Case Illustration: **Salomaa Yhtiöt – a common strategy language for the companies**

Salomaa Yhtiöt participated in Liito programme as a new client for Tekes. The company had two projects within Liito: Creative and Innovative Strategic Leadership, and Management and Competence Management as a Tool to Reinforce Service Development in Changing Marketing Sector. Key drivers for the development projects were changes in competitive landscape and the need to systemize development work in a group. When initiating the projects, each company had their own organizational development framework and practices and the aim was to find shared framework at the group level.

The aim was to create a common strategy language for the companies and through this a shared vision on strategy between the companies. Target was also to create a systematic and shared framework for business development and foresight activities. The competence management project aimed at reinforcing strategic thinking, models and tools for competence management as well as client management. The projects were initiated and led by the parent company. Several external partners were involved in the projects.

The company was very satisfied with the Creative Innovative Strategic Leadership project. However, the Competence Management project was less successful. Key results of the projects were a creative leadership metrics, strategy related dictionary, model for strategic leadership management, systematisation of business development and the need to internally train people for strategy work. Some of these did not land into their targets as well as anticipated. The projects created also an internal development networks within the group.

As impacts of the project, it can be named that the created metric shows areas of prioritization within business development. The created metrics has been developed further. Also the created dictionary related to strategy management has been also elaborated after the project. It should also be noted that competence development and culture for business development have fostered after the project. ◀

Some spin-off impacts from the Liito case studies can also be identified. Developing business management capacities and strategies has led to rethinking of company brands. Many projects included either directly or indirectly rebranding the company or a particular product. Realization of the importance of systematic business model R&D, on the other hand, has led to systematization of the processes. In addition, there was an initiation impact that led many companies to use Tekes funding.

Due to the number of actual company projects and the limitations of steering group reach, many interviewees point out that the overall impact was more limited than expected.

▶ Case Illustration: **Olvi – internationalizing business**

Olvi participated in Liito in order to gain dedicated resources and momentum to push forward some necessary development projects. The company saw a need for change in its product assortment as a response to a rising consumer trend of healthy and flavoured mineral waters. Additionally, the company wanted to improve the design of their packaging. This all aimed to internationalize the business and gain a foothold in some selected markets abroad.

The project consisted of consumer and market research related to packaging, consumer tastes and brands, research on new distribution channels abroad, creation of new product families within functional and flavoured mineral and soda waters and creation of new distribution channels abroad. The company pilot tested its new products in Russia, Sweden and Spain.

The purpose of these activities was also to develop and systematize the company's R&D activity.

The project involved several partners, research institutions and, for instance, some agencies on foreign markets. The project was prolonged from the original two years to five years, as the company wanted to do profound background work in order to achieve good results. This also enabled the implementation of new development procedures. Through the project, the company succeeded in creating some international sales to Russia and Spain. Before the initiation of the development project, the company had established international sales only through acquisitions. This project marked the kick-start of the internationalization of the company's own products. As a result of the project, the company was able to quadruple its international sales. This effect was only temporary, however, as groceries faced severe difficulties on the Russian market following the eruption of the latest crisis. ◀

Impact on the research landscape

Liito has funded research projects more than company projects. Those involved in programme management point out that the results should be measured only after the programmes. Especially the impact on research organizations is non-linear and may be seen in other research projects after the initial project has ended.

In the longer term, one of the expected impacts was to strengthen the role of business research as part of the national innovation environment. According to interviews with research project participants and steering group members, Liito increased the use of business research and market research as part of the Tekes funding. Some interviewees pointed out that after the Liito programme, the "market opportunities" are nowadays always considered in terms of traditional technology-focused R&D projects. However, the result was also part of a wider cultural change than the Liito programme (for the target setting, see also Tekes 2011, p. 9).

According to case-study interviews and other interviews, Liito had a significant impact on establishing networks involving business and marketing research competencies and enterprises, which has led to several research teams and business-university collaboration practices after the programme. The programme also brought traditional "business and marketing research" into closer cooperation with Tekes. In universities, Liito has led to the creation of research groups that cooperate and interact with the companies, as well as created new networks for business and marketing research within the universities outside the Helsinki region.

Most of the research projects studied had a close enterprise cooperation and application approach. For most of these projects, the companies have continued to develop

their business management practices together with the research organizations. Essentially, they learned to use research to support management capacity development.

▶ Case illustration: **DYNAMO – The performance of the industrial system and the management and control of dynamic networks**

The project created plausible research results on network competencies and management. Several organizations participated in the project, and they continue to carry out business management development with the research organizations. The research project influenced cooperation between VTT and several other research organizations and created a continuity for the research theme after the particular project. ◀

Impact on other actors and externalities

The themes present in Liito were not visible in the innovation funding landscape at the time. According to many interviewees, the themes of Liito were also absent from public innovation policy in general. Particularly business model development within research and enterprise collaboration approaches were not supported at the time with any other instrument.

Liito (as well as Serve) helped Tekes to build up ecosystem thinking and develop a new kind of understanding of management models. According to many interviews, Liito had an impact on the mind sets of the companies. Without Liito, the participant companies would have had less investment in R&D and in business development in overall.

5.3 Comparison of challenges and good practices

The three evaluated programmes were relevant and ahead of their time as regards their topics and aims. They created and implemented new know-how and capabilities as well as new concepts within the participating business and research organizations. The programmes also created new collaboration between different actors.

All these programmes faced common challenges. These challenges are grouped under four themes: target group reach, changing needs for programme services, the role of research within the programmes, and moving from technological to non-technological programmes. The themes are discussed in more detail below, and for each theme, some good practices to overcome the challenges are presented.

Target group reach

All three programmes, Muoto, Liito and Serve, had very wide target groups and tried to cover the entire business sector in Finland. When trying to reach research units as well as companies with a wide scope, there is a risk of fragmentation of the programmes. This challenge concerned especially Liito and Serve. According to the findings of the evaluation, especially Liito had difficulties getting its message through to the business sector, which was seen to be because the programme had such a wide context, with essentially any business case falling within the target groups of the programme. The message and context of the programme was not clear enough for the programme to be attractive for companies. With a narrower scope, it could have been easier to activate companies. This applies to Serve as well. On the other hand, thanks to the wide scope, it was possible to explore service business opportunities in different sectors at a time when the opportunities were not clear. A wide target group is therefore especially a challenge with regard to reaching relevant actors. Otherwise, it may be an advantage for the programme.

Moreover, it has also been argued that the exceptional length of Serve resulted in a loss of focus to some extent. This has been reinforced by the two programmes, Liito and Serve, being overlapping in terms of their topics. Overlapping themes made it more difficult to get the message through to the target group.

The target groups of these programmes were also non-conventional for Tekes. As regards companies, Tekes was traditionally used to collaborating with product development managers, whereas in these programmes, the main target group was top management of companies and CEOs, who were responsible for creating and implementing the company strategy. To some extent, the target groups were not reached because it was challenging for Tekes to create completely new connections to companies, some of which were completely new contacts. Especially in Liito and Serve, the target groups consisted of companies in fields where Tekes had not previously operated and did not have such good connections as in traditional heavy industry, the main customer group for Tekes in the 1990s. In Muoto, Tekes targeted primarily forerunning companies to get leading examples, which also had its drawbacks, as the target group remained quite narrow.

These challenges concerning reaching the target group can be overcome through active fieldwork and company activation at the personal level by the coordinators. Even cold calls are sometimes required and can be successful. Active fieldwork within businesses can be supported by cooperation and partnering with intermediary actors such as industry associations and alliances. This collaboration was not used in Liito. In Muoto and Serve, collaboration

with associations such as the Federation of Finnish Technology Industries and Finnish Commerce Federation were beneficial.

Changing needs for programme services

Serve was seen by many to have been quite long as a programme. A criticism has been expressed that a shorter programme could have led to more concise projects with more applicable results. Many interviewees see a need for an agile project model with short-term trials. This issue is discussed in more detail in the recommendations.

In addition, in the case of relatively small projects within companies, as was the case with many Serve projects, this can lead to internal visibility challenges within companies. Non-traditional projects for the companies can also result in weak visibility and pose a challenge for implementing the project successfully. Therefore, it should be ensured that the projects are large enough relative to the size of the company and its business.

Regarding programme management, steering group work was not very efficient in Liito and Muoto. The steering group of Liito felt it was not very integrated into the programme activities and felt that it could have been more active. To tackle these types of problems, a clearly defined and systematically executed programme strategy and strategy measures are important. These were successfully implemented in Serve, in which the steering group felt in had a clear role and active participation. In addition, the steering group should have clear objectives and a well-defined role. It has been suggested by the interviewees that even the steering group should have clear objectives and results-based indicators for follow-up. Tekes representatives have pointed out that forming a steering group is a crucial point in building up a programme. A good expert may not always be a good member of the steering group, meaning that careful consideration of suitable persons when forming the steering group is essential for the success of the programme.

Moreover, it has been argued that many of the results realized within the programmes have been visible only to those involved in the management and coordination of the programmes but not to externals, let alone the public. This means there have been serious challenges in communication. All programmes involved significant publication activities, but for some reason and according to many interviewees, this was still not enough to spread the results. Dissemination of results requires more than just one seminar presenting the results of the publication. Communication activities should be given great emphasis, especially in programmes with an Evangelista role, as Serve had. Even though special emphasis was placed on communication in Serve, it was not enough. Today, effective communication media might in some cases be digital media and videos instead of print media. However, at the time of the implementation print media was the most important one. Communication has such an essential role that in some cases, a separate communication function within a programme might be essential. In addition, different sectoral intermediate actors are important partners as regards effective communication. Success stories are a good way to communicate the creed of the programmes.

Additionally, all three programmes were criticised for having had too many auditorium-based non-networking seminars and activities. On the other hand, seminars for a large audience function as revival meetings, as they open up the eyes of those not aware of the theme or the need for change. Seminars are therefore useful, but it should be ensured that they include possibilities for networking and discussion as well.

Role of research

All three programmes emphasized collaboration between research and business as a means for achieving good research results. This collaboration was successful in some research projects but in many, it was not. The main challenges raised during the evaluation have to do with business-research collaboration. Many research projects had less concrete results concerning the implementation of the results than anticipated by the research organizations themselves.

First of all, research projects realized within the programmes have demonstrated the importance of the field-test method. Without empirical fieldwork and firm-level collaboration, the results are difficult to implement and have weak impacts. This relates especially to Liito. In many cases, the research projects lack empirical fieldwork already in the project plans due to lack of interest in field testing among researchers. The presence of business partners and fieldwork should therefore be considered already in the funding criteria.

If included in the research plan, fieldwork may pose a challenge if changes occur in key personnel in the partnering organizations. Changes in key personnel pose a challenge for continuity of the project and hinder the exploitation of research results in companies. It is therefore essential to involve a large scope of people from partner companies to ensure that the partnership is not too dependent on one person. This ensures the continuity of the project in case of changes in personnel in the partner organizations. Involving a large scope of people from partner companies also ensures visibility of the project within the company, gives credibility to the project, and makes it easier to make research results company-wide.

From technological to non-technological programmes

Serve was a pioneering programme as it focused clearly on the development of service business as the first real programme in Finland. However, pure service focus had its drawbacks, as the lack of simultaneous technology development resulted in less concrete and marketable results. The results achieved could have been better – and better implemented – if technological development had been included in the development projects. Many services require applicable technology to be successful.

A non-information-sharing and competitive setup characterized many development projects within Liito and Serve. It has been argued that programme results should be public. Suggestions related to publicity within Tekes programmes are discussed in more detail in the recommendations.

Sustainability of results is a challenge for company as well as research projects. Many of the development projects have dealt with concept development without actual demonstration or concrete measures to implement new solutions. This is characteristic to non-technological programmes where the results require much effort in the implementation phase. Moreover, when Tekes support ends, sustainability is again challenged. The implementation of results takes time, and this poses a challenge as regards the sustainability of the results. Over time, there may be changes in key personnel, strategy, organizational setup, leadership or other relevant factors in terms of running the business. These changes may mean that good results are not implemented if they are not seen as important enough in the new context. This is a general challenge for development activities, though, that is characteristic to any business in any times.

All three programmes were significant for Tekes itself and they acted as internal change agents. The programmes broke boundaries and introduced non-technological innovations within Tekes. Muoto, Liito and Serve succeeded in that they brought non-technological innovations to Tekes' policy agenda. Previously, Tekes was familiar with traditional technology development. These non-technological programmes have had an important role in either bringing or reinforcing Tekes' knowledge in non-technological innovations. The programmes also brought many new customers into Tekes' sphere of influence, such organizations (e.g. economics and business administration research units and companies operating solely in service business) that were not previously familiar with Tekes or its programmes.

6
Mixing technological and non-technological innovation support in other countries

SUMMARY

- In the beginning of the 21st century OECD implemented a study of knowledge-intensive service activities (KISA), which was, if not the first, among the very first studies on the role of service activities in enabling innovation performance. The awareness of services innovations and design among government ministries and state agencies within the EU has increased significantly since the beginning of the 21st century. However, the policy measures towards their support vary significantly across the countries. It also seems that there is still no visible trend of coherence across the policies within the EU-members.

- A benchmarking study of Kuusisto et al. (2015) notes that within Europe, Finland is among the countries that have been most active in having sustainable policies to support service innovations.

- In the comparison of five countries (Denmark, Germany, Norway, UK and Australia), Germany and Finland are the only countries having innovation promoting programmes targeted specifically to service innovations.

- In UK, the main focus of the programmes is to encourage collaboration between companies and between companies and research units.

- In Denmark and Norway government grants are given to specific projects carried out in companies to create new non-technological innovations. Norway has decided to support innovation activity mainly in selected sectors where as in Denmark the programmes address all companies regardless of their sector.

- In Australia the public innovation policy is very different with only few government-funded programmes. Public innovation policy concentrates on encouraging companies in R&D activities by organizing competitive awards for the best innovative solutions.

- The Finnish way of constructing public innovation programmes on selected new themes is rather unique. Similar programmes are hard to find elsewhere.

- Other countries' approaches to supporting non-technological innovations and related research vary a lot from high central focus (DE) to nearly non-existent (AUS).

- In general, schemes targeting solely non-technological innovations are few in other countries. Those targeting non-technological innovations are typically open to all types of innovations and not especially targeted to, e.g., service innovations.

- Grants and vouchers for companies to acquire external expertise seems to be the most common form of innovation support.

- In many other countries non-technological innovations are supported by setting up networks and clusters led by companies. In many cases these are for a specific industry, region or cluster, which is different compared to Liito and Serve.

- In many countries, service design has a prominent role in the public sector, and public sector innovation is key driver of service innovation. This viewpoint is still rather limited in Finland.

6.1 Wider international context

Policy measures and actions at the OECD level

In the beginning of the 21st century OECD implemented a study of knowledge-intensive service activities (KISA), which was, if not the first, among the very first studies on the role of service activities in enabling innovation performance. The study was based on case reviews and involved 11 countries: Australia, Denmark, Finland, Ireland, Japan, Korea, New Zealand, Norway and Spain. KISA studied the occurrence of different knowledge-intensive service activities in the aforementioned countries and industries, as well as how these service activities work at the company level. The final report of the study was published in 2006 by the responsible OECD Working Party on Innovation and Technology. According to it, policies that facilitate KISA-based innovation include at least (OECD 2006):

Already simultaneously with the KISA study, OECD had also some other initiatives that on their part contributed to the understanding of service innovations. An example is the horizontal project Enhancing the Performance of the Service Sector, which included a part that aimed to describe innovation in service sector industries and identify policies among OECD countries that improve innovations in services. According to the study, however, at that time most OECD countries did not have innovation policies accommo-

dated to the service sector or to services-related concerns. Moreover, the participation of service-sector companies has been low even in sector-neutral programmes. (OECD 2005).

Policy measures and actions within the European Union

The awareness of services innovations among government ministries and state agencies within the EU has increased significantly since the beginning of the 21st century. However, the policy measures towards their support vary significantly across the countries. It also seems that there is still no visible trend of coherence across the policies within the Union. This indicates that there is an increasing need for sharing good practices within the members. (Kuusisto et al. 2015).

Perhaps the most remarkable EU-initiative around the theme of service innovations has been EPISIS – European policies and instruments to support service innovation – a cooperative project implemented between September 2009 and August 2012. The project was coordinated by Tekes. In addition, the project partners included DASTI from Denmark, PT-DLR from Germany, Vinnova from Sweden and BIS from the United Kingdom. Other parties across Europe were involved in the project through a forum called the European Service Innovation Think Tank, which was set up

Table 1. Sample policy measures.

Direct policy intervention targeting businesses or organizations	• Securing service development related private and public financing, grants and tax credit for businesses • Transfer of enabling technologies that can support the role of KISA in innovation
Indirect policy intervention targeting non-business actors within the innovation system	• Securing the skills base needed by service innovators • Widening the focus of RTOs towards non-technological innovations
Development of framework conditions facilitating the role of KISA in innovation	• Opening up of new markets for service providers • Cutting down the regulatory burden • Financing for the use of external KISA • Good practice development, standards for service quality • Cultivating services related to innovation culture
Development of existing innovation policies, more service-friendly	• Adopting the broad innovation concept, acknowledging the value of process innovations and product innovations • Adapting financing and assistance criteria so that services-related innovation projects get better access to existing policies • Training and skills development in service-related innovation for actors executing the innovation policy
Development of new policy measures targeting issues that are central to the development of KISA and services-related innovation	• Networks and customer interaction as innovation platforms • Developing organizations that are more capable of using internal and external KISA.

by the project. The main goal of the EPISIS project was to promote the development of service innovation through cooperation between policymakers and innovation agencies that exceeds the borders of countries. (European Union 2012).

In addition to offering the open forum (the European Service Innovation Think Tank) for discussion, the project also tested new policy approaches to support service innovations and organized conferences to ensure the spreading of the results. The project aimed to discover policy challenges around the promotion of service innovations, to design policies to tackle them as well as to encourage the use of new policy tools and measures. A core approach between the EPISIS project was its horizontality as it acknowledged service innovations as phenomena that cut through an entire economy. The focus was also on service innovations and their promotion in the private sector, while public sector was not discussed. (European Union 2012).

In 2011 the EPISIS conference launched European Service Innovation Strategy and the following year the so-called Helsinki principles were announced. The Helsinki principles include policy recommendations to better benefit from service innovations. The European Service Innovation Strategy states that at least the following policy measures and actions have a key role in supporting service innovations (European Union 2012):

- Influencing the European Single Market Act
- Influencing the upcoming High Level Group on Business Services[2]
- Influencing FP7[3], Horizon 2020 and other EU support programmes
- Providing smart financial solutions for growth
- Creating an internationally shared knowledge base on service innovation within the EU
- Raising awareness within EU institutions and the EU27
- Enforcing dynamic European markets for service businesses
- Competitive building
- Leveraging of the full potential of innovative service and solutions business.

The EPISIS project also concluded that the state aid rules are an important mechanism through which new policies can be implemented. In this context, it is important that technological and non-technological innovations get similar treatment, experimentation is encouraged, new forms of innovation processes become promoted with flexibility in the rules, and de-minimis aid is exploited instead of small innovation aid instruments. (European Union 2012).

To contribute to the Europe 2020 strategy and to promote service innovations' role in this, an Expert Panel on Service Innovation was set up at the turn of the decade. The panel consists of innovation experts from different countries across Europe, including, among others, policy makers, representatives from innovation agencies, industry representation and relevant associations and other organizations. In its report from 2011, the panel states that a crucial challenge within the Europe is creating a coherent policy framework, which has service innovation aspect embedded in all levels of policy making. In achieving this, the panel noted that in the policy frontier, there is need for raising the awareness of the potential of service innovations, strengthening political leadership at the European, national and regional levels, building new competitive business from service innovation, developing dedicated programmes to support innovative services, and to promoting the application of service innovations to meet societal challenges. More concretely, the panel emphasized the importance of developing a European Service Innovation Centre (ESIC). The notion was partly founded on the notion that besides the EPISIS project, the information related to service innovations within the EU is fragmented. (The Expert Panel on Service Innovation in the EU 2011).

The ESIC was founded as a direct consequence of the panel's report in 2011 and it further leaned to the work carried out by the EPISIS project. ESIC's main task has been to demonstrate the dynamics and effects of service innovations and to evaluate their impact on competitiveness, industrial structure and regional development as well as on employment structures, economic patterns and value creation. (Kuusisto et al. 2015).

In 2011, The European Commission also launched a programme called EDII (European Design Innovation Initiative), which has through six different projects aimed to "promote and exploit the potential of design for innovation". EDII has had participation from 19 EU members and 46 organizations within them. Among the projects was, for example, SEE Platform that shared design policies and programmes in Europe by organizing workshops and connecting public bodies. (Kang 2015).

In 2013, the EU launched an Action Plan for Design-Driven Innovation, which aims to "accelerate the take-up of design in innovation policies and to create the capacity and competencies needed to implement these policies". To implement the action plan, a Design for Europe (also known as the European Design Innovation Platform) was kicked-off a year later. The platform is co-financed by the European Commission and is expected to run until the end of 2016.

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2 High Level Group on Business Services was a group launched in 2013 to help policy makers to tackle challenges for business services and to draft development recommendations.
3 7th Framework Programme for Research and Technological Development.

Its members include design organizations, research institutions and business support organizations. Its practical work includes, for example, preparing case studies as well as guides and tools and running events and workshops. (EC Europe online).

Examples of policy measures from European countries

A benchmarking study of Kuusisto et al. (2015) notes that within Europe, Finland is among the countries that have been most active in having sustainable policies to support service innovations. In addition to Finland, good examples can be found from Ireland, Sweden, Austria, Germany and Denmark. The development of completely new instruments to support service innovation within EU is, on the other hand, very modest. Examples of new approaches can be mainly found from Eastern Europe, in countries like Poland, Estonia and Slovenia. The paper of Forfas (2014) moreover categorizes the taken policy directions to four themes: business and applied RD&I (e.g. funding), cluster and networks (e.g. start-up support), research (e.g. research programmes) and policy and strategy (e.g. strategic action plans). Using this categorization, the measures taken up in Finland and Austria to a large extent present RD&I support, while actions in the United Kingdom mostly present cluster and network approach. The actions in Germany are both research support and policy and strategy level measures.

In Sweden the National Innovation Strategy that was launched in 2012 has been an important initiative in promoting service innovations, though Sweden has in overall been successful in setting up service businesses even before this. The strategy was created in a dialogue that involved multiple stakeholders. As a central future focus and development area, the need to maintain such participatory discussions has been acknowledged in Sweden. (Kuusisto et al. 2015). The National Research Prioritisation Exercise in Ireland has similarly perceived innovation in services and business processes as an important priority. It has been noted that currently the support measures in Ireland mostly focus on traditional R&D&I -measures that are often not optimal to support service innovations. (Kuusisto et al. 2015).

In Austria one key service innovation promotion measure has been DLI services initiative (*Dienstleistungsinitiative)*, which targeted service companies and provided them with potential funding. In comparison to Serve, for example, DLI has been small-scale: its budget was around 25 million euros between the implementation years of 2009 and 2013. (Kuusisto et al. 2015). The General Programme of Austria moreover offers funding to companies for their R&D projects and aims to share information and other support to project development. (Forfas 2014).

Poland has developed a pilot instrument based on Tekes' Serve programme. The Polish programme is founded on both project support to companies, research units, national and international networks, as well as on the exchange of best practices, creating forums for companies, training on product management and protection of intellectual property rights. The Polish Enterprise Development programme also recognises the implementation of projects that promote non-technological innovations as an important measure to support service innovations. The implementation of these projects can include actions such as product marketing. (Kuusisto et al. 2015).

In Slovenia, the most important measures to promote non-technological innovations have included, among others, the launch of a Competence Centre for Design Management, support for new research and development units or the diversification of these, a research voucher pilot for industrial research in companies, as well as research and development tax allowances. The Competence Centre for Design Management is partly financed by the European Social Fund and its key task is to increase the understanding of design's role in building added value for products. In 2014 Slovenia also introduced a policy mechanism to provide loans for innovative start-ups. In addition to the loan, the instrument includes training to increase the companies' competence building. The skills taught include marketing, financing, user experience and internationalization skills. (Kuusisto et al. 2015).

In Netherlands there is a special think tank called the Service Science Factory, which aims to integrate students, academics and professionals within companies to carry out service innovation projects. By providing project teams to solve the problems of companies or other organizations, working solutions that often are new services or their prototypes are being created. The factory is an initiative of the University of Maastricht and has a focus in also providing students the possibility to complete innovation projects and, hence, to add value to research and teaching. However, the factory has had some challenges in encouraging academics to participate in applied research projects since research funding has usually been granted on the basis of publications. (Forfas 2014).

Similarly, in France there is a cluster NEKOÉ, which brings together different partners from universities, research, industry and support agencies for innovations. The cluster both provides support for service innovation projects and educational programmes. The courses are focused on teaching different tools and methods for innovation in services. Participating the NEKOÉ cluster, however, requires paying a fee. The cluster has been somewhat criticized for its overly ambitious targets in relation to the scope of the activities at regional level. (Forfas 2014).

Table 2. Sample Design policy measures.

Country	Examples of policies
Denmark	Denmark has a specific Commission for Danish Design Promotion, which focuses on promoting design as a factor of economic growth. In addition to enhancing design competences, the use of public procurement has been a common policy tool. In 2007, a DesignDenmark policy was introduced, which has aimed to improve market conditions for design and to increase the commercial orientation of design research. In the Danish national innovation policy from 2012 design is named as an important user-driven innovation tool. In 2013 an action plan for the creative industries and design was introduced.
Sweden	In Sweden the design policy is described under the national design policy and embedded in multiple different initiatives under the jurisdiction of different ministerial agencies. Multiple public bodies also have a responsibility of promoting design. The overall national approach is coordinated by the Ministries of Culture, Industry and Education.
United Kingdom	The Design Council has a key role in promoting and developing design. The Council was set up already in 1944 and, hence, has a long tradition in promoting design-oriented thinking. The focus of recent years has been especially in the supporting the development of design-led solutions that tackle social and economic problems.

In general, it is noteworthy that many European countries have specific programmes for innovation policies. The importance of service innovations has been increasingly acknowledged in these. In addition, many countries have established different competence centres and clusters to promote service innovations. Besides the aforementioned, examples of such clusters and centres include The Centre for Services Innovation in Norway, Financial Services Knowledge Transfer Network in the United Kingdom and the Industry Science Research Alliance – ISRA in Germany (Forfas 2014).

In terms of policies to promote design competences, a common trend has been to link design policies to other policy frameworks, especially to research and development policies. Some international examples of design policies can be found in Table 2. (Kang 2015).

In addition to the European countries, good examples of active service design policies can be found from, for example, Australia, Canada and South Korea.

6.2 Meta-analysis of country samples

In the following, we compare public support mechanisms on design and service based innovations in five different countries, Denmark, Germany, Norway, UK and Australia. Denmark and UK are similar to Finland in a sense that all these countries have a clear national design policy, specific design support mechanisms and design promoting strategies in place as well as established design centres promoting the use of design. In Norway, Australia and Germany some of these elements are in place but not such a wide palette of policies are in use as there are in Finland, UK and Denmark. (Whicher et al. 2012).

The degree to which design is implemented in public policy in different countries can be assessed with the design ladder. On the lowest step of the ladder, there is no design policy in the country, as is the case for example in Germany. On the second step of the ladder design policy is seen to encompass merely industrial design. On the third step, design policy is seen to encompass also service design. On the fourth, and the highest, level of the ladder where Finland, UK and Denmark are, design is seen as strategic source of competitiveness.

The use of design has a very deep rooted role in Denmark, which has for decades been the world's leading country in the use of design. However, the design policy seems to have gained an even more prominent role in the UK where design is visible in concrete policy activities and programmes. For example, in Denmark nearly all companies (93 %), have design activities, compared to 66% in the UK and 57% in Finland. Additionally, in Denmark nearly every fourth company uses design strategically. In the UK, companies invest heavily on design compared to other R&D activities, whereas in Finland and Denmark companies are investing much more on other R&D than design. Expenditures on design made by companies in relation to the national GDP is over seven times larger than in Denmark. When looking at public expenditures on design, the picture changes, however, with Denmark spending four times more on design in relation to national GDP. Public expenditures on design are the highest in Finland, which spends over twice as much on design as Denmark. (Whicher et al 2012).

In Finland, companies make a large share of investments in R&D in general (see Figure 12). Norway presents the other extreme with regards to the benchmarking countries selected in this survey. In Norway, the public sector

Figure 12. Public and business expenditure on R&D, as a% of GDP (OECD, data is from 2010 or other last year available)**.**
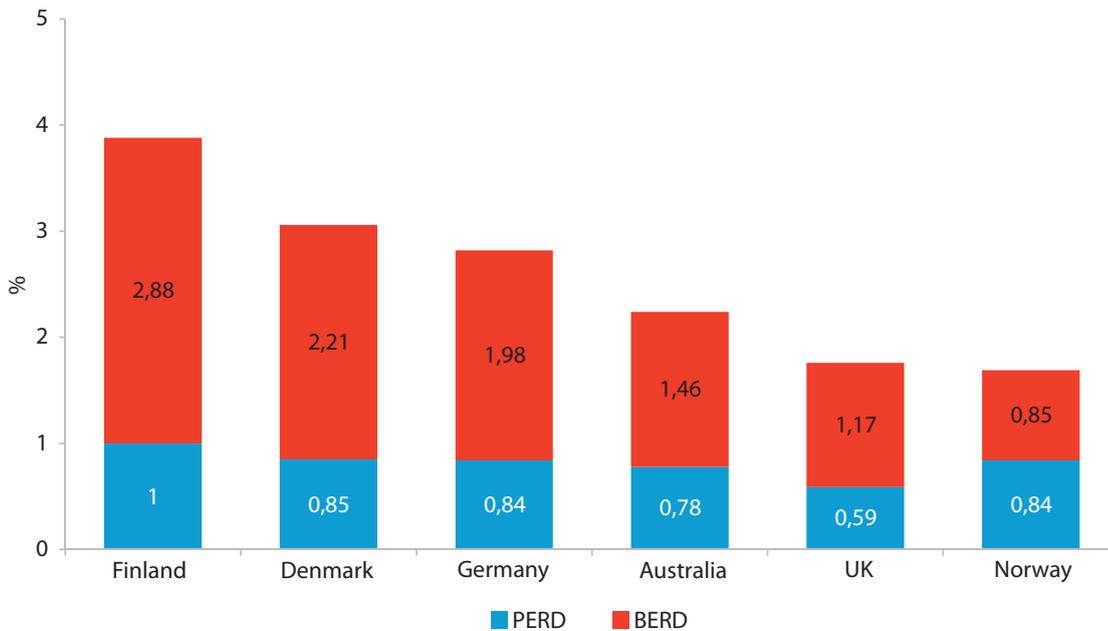
finances nearly half of all R&D. If this general division of public and private financing with regards to R&D expenditure applies also to non-technological innovations, the largest share of R&D efforts related to service innovations wold be made by companies in Finland, Denmark and Germany.

In Denmark, Norway, UK and Finland non-technological innovations are promoted at the state level with government-funded programmes. The focus of the programmes varies between the countries. In UK, the main focus of the programmes is to encourage collaboration between companies and between companies and research units. In Denmark and Norway government grants are given to specific projects carried out in companies to create new non-technological innovations. Norway has decided to support innovation activity mainly in selected sectors whereas in Denmark the programmes address all companies regardless of their sector. In Australia the public innovation policy is very different with only few government-funded programmes. In Australia, public innovation policy is concentrated on encouraging companies to R&D activities by organizing competitive awards for the best innovative solutions. Australian innovation policy is more focused on technological R&D activities than on non-technological R&D. In Germany, innovation policy at the national level concentrates mostly on supporting research related to non-technological innovations. Concrete innovation activities are taken at the provincial level and these measures vary greatly.

Germany and Finland are the only countries having innovation promoting programmes targeted specifically on service innovations. In other countries, innovation promoting programmes are sector neutral and services

are promoted by all programmes. The countries vary also to the extent whether they see a difference in supporting innovation activity within large and small companies. Some countries have innovation policies especially targeted to small and medium sized companies. In the UK, for example, there is a special concern that despite overall satisfaction and effectiveness of the innovation policy mix, it is seen that this does not reach and produce adequately innovations within SMEs. Below, a figure illustrates the extent to which business expenditure on R&D is made by small and medium size companies. In Germany, UK and Finland, over 80% of expenditure on R&D is made by large companies. In Norway almost half of all R&D is made by SMEs.

In general, it can be stated that innovation policy systems are complex and vary greatly by country. Innovation policy systems are also made up of a large number of complementary elements meaning that their effectiveness is determined by how well these elements interact within and respond to the demands of the broader economic and societal system. It can also be seen that countries succeed with different mixtures of inputs and policy structures. International benchmarking is therefore challenging.

Based on the country sample some key observations can be made comparable to Finland. First, the Finnish way of constructing public innovation programmes on selected new themes is rather unique. Similar programmes are hard to find elsewhere. Second, other countries' approaches to supporting non-technological innovations and related research vary a lot from high central focus (DE) to nearly non-existent (AUS). Third, in general, schemes targeting solely non-technological innovations are few in other coun-

tries. Those targeting non-technological innovations are typically open to all types of innovations and not targeted to e.g. especially for service innovations. Fourth, grants and vouchers for companies to acquire external expertise seems to be the most common form of innovation support. Fifth, in many other countries non-technological innovations are supported by setting up networks and clusters led by companies. In many cases these are for specific industries, regions and clusters. This is different compared to the Finnish programmes Liito and Serve. Sixth, and finally, in many countries, service design has prominent role in the public sector, and Public Sector Innovation is key driver of service innovation – a viewpoint still rather limited in Finland.

The table 3 gives a summary of most relevant international examples which are described in greater detail in each country chapter.

Figure 13. Structural composition of business expenditure on R&D (OECD Statistics, 2010 or the latest year available)**.**
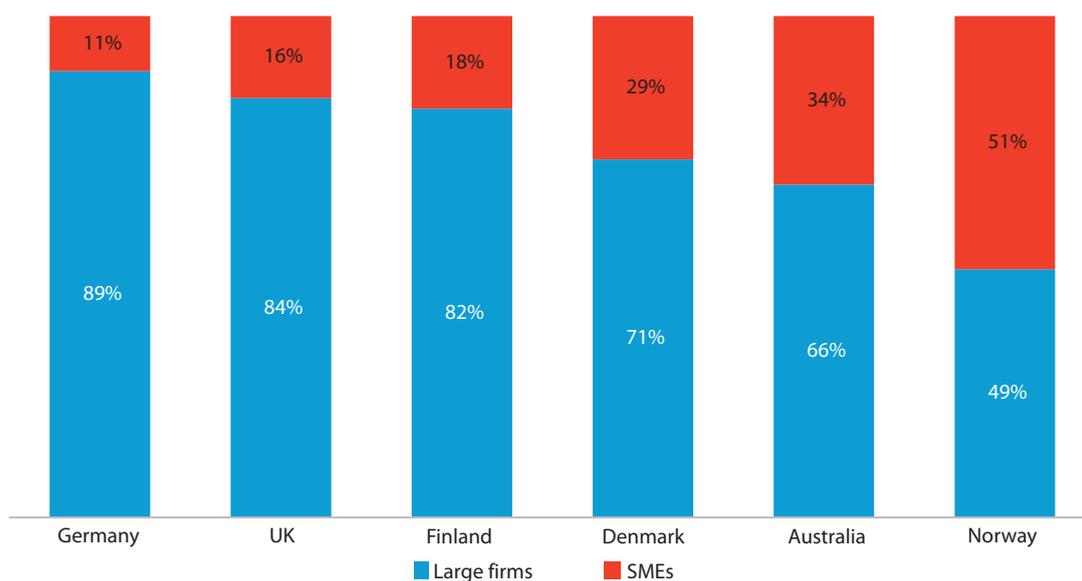

Table 3. International examples.

Instrument	Country	Target group, theme	Learning points
The Service Design Knowledge Transfer Centre (KTC) in Wales	UK	SMEs in general and service design companies. The programme influenced the use of design methods in companies by increasing knowledge of potential service designers to be able to cooperate with companies and meet their demands.	The programme succeeded in creating numerous collaboration projects and establishing a centre of service design expertise in Wales. The programme created a service design sector in Wales.
IFU (The programme for research and development contracts).	Norway	All companies. Supporting market-oriented innovations by publicly funded grants for collaboration projects realized within firms and including a customer or supplier in the project	Customer or supplier involvement has proved successful and the programme has yielded more results to participating companies compared to other programmes in Norway.
Arena	Norway	Creating strong cooperation networks between companies, public sector, research sector, consultants etc. by providing public grants for development projects of the networks	The programme has increased knowledge and know-how within the networks. It has proved successful in supporting the growth of business of self-employed.
UDI (User Driven Innovation Programme)	Denmark	SMEs. Public funding for development projects to promote the development and testing of user-driven methodologies in companies.	Better results are achieved with longer term projects carried out by strong and large conglomerates or groups rather than by dividing the budget for various small short-term projects realized by different actors and companies.

6.3 Case UK

The role of non-technological innovation in the innovation policy

Introduction

Despite the fact that the United Kingdom is a very service intensive economy, the introduction of a national innovation policy targeted at promoting services took place as late as 2008 by the British government issuing a white paper 'Innovation Nation'. The aim of the paper was to make UK the best country in the world in innovative business and public services. The paper put emphasis on knowledge intensive services (KIBS) and creative industries. Special emphasis was put on the role of consumers and user-driven design in creating innovations. The policy underlined also public services with the aim of inducing major societal innovations and making British public services the most innovative in the world. Policies include knowledge transfer between the research sector and business as well as demonstrating lead examples. At the same time of the Innovation Nation declaration, the Services Policy Unit (SPU, department within Department of Business, Innovation and Skills) published a report 'Supporting Innovation in Services', which underlined the need for convergence in service and manufacturing innovations and a more networked approach to service innovations. (Kuusisto 2012).

In 2011 the government issued a new Innovation and Research Strategy for Growth. This strategy stressed the ecosystem thinking and the existing strengths of the British business and economy, which need to be fully exploited to provide innovations. The strategy put special emphasis on creative industries and especially on the interaction of research and business in this field. Distinct to the innovation policy in UK is the small number of government-driven particular innovation support programmes. Instead, innovation and especially service innovation are supported by promoting favourable framework conditions and a favourable environment (especially knowledge transfer and accumulation ensuring educational system). The aim is that a favourable environment encourages business and research to cooperate resulting in innovations. There is strategy and resources in place for knowledge exploitation, the UK being ranked one of the best countries in the world for university and business interaction. Support is provided through a large and diverse public and private commercialisation sector resources, such as science and innovation parks (over 100 in place), university technology-transfer offices (over 50 in place) and national initiatives bringing together universities and business, in addition to 11 Catapult Centres. (Kuusisto 2012).

The innovation support in UK is complex with policies taking place on several levels between governmental and regional levels as well as on different national levels between different nations. Many of the organizations supporting innovation are private meaning there are several horizontal financing channels for innovation policy activities. In terms of knowledge creation, the country has a stable independent science and research-funding sector. Research Councils provide competitive grants for specific projects and programmes. Higher Education Funding Councils (HEFC) provide block grant funding to universities on the basis of quality measured by the Research Excellence Framework (REF). An allocation of 5,85 billion pounds is in place for government to spend in science and research from the budget in 2015–2016.

Towards supporting innovation, direct and indirect government financial support occurs. Direct support for innovation through government agencies is complemented by much larger indirect support and further public support for venture capital and angel investment. Also R&D tax credits exist in the UK and the tax environment is very attractive especially for SMEs in international comparison (UK Government 2014). There are numerous organizations providing support for innovations. Although policies or programmes specifically for service innovation are scarce, some programmes and tools developed by Innovate UK give priority to such service sectors as creative industries, financial services, health care and social work. The most successful programmes acknowledging service innovations are Innovation Platform, Innovation Voucher and Knowledge Transfer Networks. Additionally, the Innovate UK supports heavily innovation in creative industries. NESTA is the primary organization that supports service sector innovations.

The development of design policy

In general, use of design is well established in the British economy. However, there are fields where design awareness is low, in particular within SMEs. There are multiple design centres in the UK. Design centres act between public and private sectors uniting them and enabling the implementation of design policy. (Design Policy Monitor 2012). The Design Council founded already in the 1930s acts as an agent and has quite prominent role in promoting design in the UK. It tries to connect researchers and business leaders through partnerships. The Design Council provides also research and support to companies unlike the Design Forum in Finland, which is merely a design promotion agent. The Design Council supports also industrial tech-start-ups on how to use design to foster business and accelerate growth.

Major players within the UK Innovation system in terms of non-technological innovations include – Innovate UK, Nesta, and the Research Councils UK (RCUK). The following describes each of the centres' methods to promote innovations.

Work of Innovate UK

Innovate UK is the largest innovation agency in the UK. The mission of Innovate UK is to accelerate economic growth by stimulating and supporting business-led innovation, bringing together business, research and the public sector. Supporting and accelerating the development of innovative products and services to meet market needs, tackling major societal challenges and helping build the future economy. Innovate UK's budget for 2014–2015 of 8 000 million euros is directed towards developing technologies. The support it offers is delivered largely through programmes, of which some address services. These include Catapult Centres, SMART grants, innovation vouchers, Knowledge Transfer partnerships and networks, challenge platforms (energy; built environment; agriculture and food; healthcare; transport) and pre-commercial procurement programme SBRI.

Innovation Platform

The programme deals with integrating industry, academia and government to create innovative solutions. Innovation Platforms have been established in the following areas: low carbon vehicles, assisted living, low impact buildings, detection and identification of infectious agents, stratified medicine and sustainable agriculture and food. Some activities are directly linked with service sectors such as The Assisted Living Innovation Platform. The Innovation Platforms are some long-term support vehicles as they have been in force for over ten years (with varying topics though). (Kuusisto 2012, UK Government 2014).

Innovation Vouchers

The programme provides support to SMEs to set up collaboration with knowledge providers and in this way promotes knowledge exchange and spurs new solutions. The vouchers have gained popularity among SMEs and the programme has been found to have positive impact on participating companies. The programme has increased cooperation of SMEs with knowledge providers, it has resulted in new innovative processes being introduced into businesses, the programme has also made SMEs more aware of knowledge services associated with their businesses. Participating companies have found to continue cooperation with their new knowledge partners after the expiry of the voucher. Some of the priority sectors of the vouchers are within services such as financial and professional services, digital services and creative businesses. (Kuusisto 2012).

Catapults

The Catapults are a network of business-focused technology and innovation centres created by Innovate UK. The centres were established in 2011 to create a new framework for long-term investment and joint working between business and the UK research base and in this way to close the critical gap between research findings and their subsequent development into commercial propositions. The purpose was to create an intermediate actor between business and research. Catapult centres encourage business investment in R&D and are funded by a mixture of public sector grants and business funded contract research. Catapults build on the competencies of the sector and fill gaps where areas are under-funded, or provide capabilities where these do not yet exist or a risk of market failure is large. The ambition being to providing access to the specialist capability and expertise required to transform innovative ideas and technologies rapidly into commercial products, processes and services. The centres were established on selected strategically important areas. (Hauser 2014). Currently there are 11 priority areas: Cell and Gene Therapy, Compound Semiconductor Applications, Digital, Energy Systems, Future Cities, High Value Manufacturing (a network of another seven centres), Medicines Technologies, Offshore Renewable Energy, Precision Medicine, Satellite Applications, and Transport Systems.

Early evidence indicates that the centres have launched a large number of R&D projects between companies and research institutes and thereby induced significant R&D investments. Many of the initiated projects develop new technology and combine this with new cutting edge services. The performance of the centres shows that, overall, they have reached their targets in terms of collaboration projects and investments in R&D. The centres have also succeeded in creating new partnerships resulting in R&D projects and new solutions. It can be seen that the centres are promoting the creation of new clusters. However, there is one aspect where the centres have not succeeded and this is the engagement of SMEs. Reasons for this are seen in the relatively wide geographical influence areas of the centres meaning SMEs might find the centres distant. It has also been argued that there is lack of clarity in the communication of the value of Catapult centres' services in relation to other organizations supporting R&D activities in companies. (Hauser 2014).

The Knowledge Transfer Network

The Knowledge Transfer Network (KTN) is a UK-wide network of knowledge intensive businesses and academics. It is designed to stimulate innovation by promoting collaboration, best practice and knowledge sharing between industry and academia. Ultimately the KTN intends to drive knowledge transfer between knowledge creators and knowledge users. KTN Ltd was set up in April 2014 to coordinate the work of what was previously 15 individual KTNs. Some of the individual KTNs are particularly targeted to service sectors (e.g. creative industries and financial services). In general, the programme is moving from R&D centric approach to include more to service innovation. For instance,

the Financial Services KTN and the Creative Industries KTN stimulate and encourage innovation related to services. (Kuusisto 2012).

The KTN provides a forum and organizes events providing opportunities for businesses and researchers to network, and helps set up special interest groups on emerging areas of interest, which in turn help focus Innovate UK funding calls. At international level it sets up sector specific missions to priority countries, helping connect researchers and innovators in the UK with overseas opportunities. It helps organizations in the UK to access overseas funding schemes. (Kuusisto 2012).

There exist also Knowledge Transfer Partnerships (KTPs), which enable companies to form strategic partnerships with education, research and technology organizations. Partnerships are realized in the form of shared projects for which at least one recently graduated associate is recruited to be in charge of. The relationship formed between the business and the knowledge base partner, facilitated by the associate, allows the transfer of knowledge, technology and skills to the company. The programme has an annual budget of some tens of million euros and it supports annually over 1 000 projects. KTPs work closely with several service sectors, e.g. creative industries, retail sector and financial sector. (Kuusisto 2012).

The KTP Programme in Scotland has proved to be successful when it comes to satisfaction among programme participants and reaching programme objectives. The programme has proved to be effective when it comes to new job creation and new turnover creation. However, the programme is considered to lack visibility and have too low a profile and for these reasons emphasis should be put on marketing and promotion of the programme, which has, in other circumstances, proved to be crucial in attracting especially small enterprises. (Ekos 2015).

In the last five years, KTN has helped thousands of businesses secure funding to drive innovation, and has supported them throughout their business cycle. (Kuusisto 2012).

Nesta

NESTA was originally set up in 1998 by an independent endowment in the United Kingdom established by an Act of Parliament. In 2010 the Government announced that it would transfer old NESTA's status from an executive non-departmental public body to a new charitable body. In 2012 the old NESTA transitioned from being an executive to a charitable body, changing its name to Nesta. Nesta currently operates in four main areas: economic growth, investment, public services and creative industries.

In 2012 the charity launched a 25-million-pound impact investment fund, Nesta Impact Investments, run by its subsidiary Nesta Investment Management. The fund invests in social ventures with innovative products or services that

address the three challenges of an ageing population, the employability of young people, and the sustainability of UK communities. Combining impact investing and new service innovation, Nesta is a rather unique player in the field.

Nesta also runs practical programmes to find innovative ways to deliver cheaper, more efficient public services, and demonstrating how these can be scaled up across the UK. Recent examples of their work includes the Innovation in Giving fund, in partnership with the Cabinet Office, which seeks to find and support new platforms for the giving of time, skills and money. Nesta also specializes in original research into the UK's creative industries, and runs practical programmes to help the sector. It runs the Digital R&D Fund, in partnership with Arts Council and the Arts and Humanities Research Council, and also runs the Creative Business Mentoring Network, which pairs mentees from creative companies with experienced business leaders.

Designing Demand

Designing Demand is a programme that helps SMEs build their design capability by offering mentoring services to companies. It helps the management of participating companies to understand the role and potential of design in improving business growth potential and success. The resulting projects have delivered new or improved products, services, systems and brands. According to estimates, each pound invested in the programme has returned 12 pounds in gross value added.

Case examples of support of non-technological innovation

The Service Design Knowledge Transfer Centre (KTC) in Wales has helped SMEs in the region to understand and use design-based service innovation methods in their business development. The programme influenced the use of design methods at the bottom line and was demonstrated in Welsh companies. The programme increased the knowledge of SMEs and at the same time trained potential service designers to be able to cooperate with companies and meet their demands. The programme was mainly financed by EU through the Welsh Government.

The Service Design KTC organized workshops, seminars and conferences targeted to companies in creative industries and advanced manufacturing. The events attracted also participants from other sectors leading to unexpected and wider collaboration. The purpose of the events was to raise awareness of the potential of service design in business and provide opportunity to create a network within the topic.

The programme led to the emergence of 29 collaborative R&D projects, some 70 significant product or process improvements, and even some new registered products

and processes. The programme induced R&D investment of 130 thousand euros and created 40 jobs. The programme gained international awareness when it received the 2012 Core77 Design Award for service design. The programme succeeded in establishing a sustainable centre of service design expertise in Wales.

Learning points

In the UK the government is seen as a catalyst and a driving force in shaping the environment towards supporting innovative activity. Innovations are seen to spur on the market as a result of collaborative actions taken by companies and organizations. Public forces are seen essential in spurring new solutions and spin-offs within organizations and creating institutions to enable this and collaborative actions. The UK innovation policy relies heavily on creating collaboration between academics and business and many of the publicly funded programmes are targeted on creating clusters and collaboration platforms and demonstrations. Studies show that clusters enabling collaboration and competition tend to spur innovations (Bonner et al. 2013, Allas 2014). In this light, it seems that UK is on the right track in its innovation policy. In addition to a relatively large number of important clusters with critical mass, also effective university collaboration with R&D intensive business and competitive funding for R&D are considered as strengths of the UK innovation policy. Despite the number of actions taken to encourage collaboration between SMEs and the research sector, this is still considered inadequate and a weakness of the system.

6.4 Case Norway

Role of non-technological innovation in the innovation policy

The development of design policy

Norway does not have a distinct design policy. In 2008 the government raised equality of citizens and physical accessibility a high priority in the policy agenda by issuing Norway Universally Designed by 2025 strategy. The same themes had been promoted also previously by four preceding policy agendas with same priorities. Universal design in the government's strategy means that the main solution for all new procurements, buildings and facilities intended for the general public is to be universally designed to meet the needs of all citizens despite their physics. Plans are also to be based on the principles of universal design. This is assured through such things as legislation and guidelines and the efficient follow-up of these. The government's vision that Norway is to be universally designed by 2025 can

be achieved using various instruments that are adapted to suit the various sectors and tasks. (Norve et al. 2010, Norwegian Ministry of Children and Equality 2009).

The development of service business

Innovation policy in Norway is sector-neutral. Policy instruments address all sorts of innovation, though, some emphasise is put on schemes designed to enhance innovation in certain service sectors such as tourism and the maritime industry. Characteristic to innovation activity in Norway is that it lags in intensity and results that of many other European countries. Despite governmental awareness of this, no significant changes in policy instruments or measures to address especially non-technological innovations have yet been made. It should also be noted that policy instruments in Norway fulfil regional policy purposes and are at least to some extent designed to promote business activities in rural regions. In general, companies in rural areas have better access to public funding relating to business development and innovations than enterprises in urban areas. (Kuusisto 2012).

The administration and execution of Norwegian research and innovation policy is rather concentrated with two primary large institutional actors: Norwegian Research Council and Innovation Norway. There is a relatively clear division of work between these two institutions with Innovation Norway concentrating on supporting and promoting market-driven innovations and Research Council more research-driven and technology-driven innovations. (Kuusisto 2012).

Innovation Norway is the primary organization supporting innovation within service sector companies, though no innovation supporting programme is targeted solely at service sector companies. Approximately one fourth of grants of different innovation supporting schemes were given to service companies with tourism, healthcare and oil and gas being the largest sub sectors within service sector companies. Many of the schemes of Innovation Norway are sector or industry specific with agriculture, tourism and maritime sectors being the sectors for which there are most supporting schemes. These sectors contain much service providing companies. Hence, much of support and grants delivered through these programmes is indirectly directed to service sector companies. (Kuusisto 2012).

Case examples from Innovation Norway

Innovation Norway – OFU/IFU

There are two schemes supporting market-oriented innovations in the public (OFU) and private (IFU) sector organizations. Support is directed towards market-oriented development projects involving a supplier or a customer aiming at a new innovative product, service or process. It is note-

worthy that one of the programme's objectives is to renew operations in the public sector. The purpose is to support the creation of projects, which have a co-creation focus. The instrument supports mainly research projects and a significant share of the support is directed to service companies especially in healthcare and ICT. The programme was founded already in the 1960s. (Kuusisto 2012).

The programme has been evaluated several times. According to the most recent of these evaluations, the programme has succeeded in bringing value-add to customers participating in the funded projects. Participating companies see that involving a customer or a supplier in the project entails more value add to the company. Projects funded by the programme have reached better results compared to other development projects funded by Innovation Norway. Through increased market-oriented cooperation, the funded projects have entailed knowledge accumulation in the participating companies. Among the short-run effects, are increased export and competitiveness. In the long run, then, the projects have entailed economic benefits to companies. More than half of the participating companies see that their turnover has increased due to the project.

Innovation Norway cooperates with the state tax authority with regards to SkatteFunn support (see below). The OFU / IFU programmes help newly established companies in commercializing their products and services and in this way shorten the zero income period of the companies. By doing so, the programmes also make it possible for companies to sooner benefit from tax credits. OFU / IFU programmes have thus enabled the wider use of tax credits also in smaller companies. It is expected that without the programmes tax credits would have been used more rarely by small companies. Moreover, the evaluation shows that the better the companies understand the needs of their customers and suppliers, the better they succeed in business in terms of sales growth, employment, competitiveness, exports and so on. (Furre et al. 2012).

Arena programme

This is a programme aimed at the establishment of larger networks of companies. The Arena programme is partly financed by the Research Council. The programme supports three-year development projects involving several different parties (companies, public sector, research sector, consultants etc.). Collaboration has to be long-term and share a common aim to support for example internationalization, competence development and new business creation. The objectives of the programme are to support stronger relations between different actors, the creation of strong cooperation networks, increased innovation activity among organizations and to support business in different regions.

According to an evaluation report, the participating companies have found the programme useful and the development projects funded by the programme have supported their business. The projects have strengthened participants, especially research exploitation, know-how and there have also been some knowledge spill-over effects within the region of the collaborating partners. The programme has proved to be helpful especially in the case of self-employed entrepreneurs, which have benefited remarkably from collaboration with external professionals with wider knowledge base and know-how from different sectors. The growth of business has been faster in participating companies compared to other companies. (Flatners and Furre 2012).

NCE programme

Norwegian Centres of Expertise (NCE) is a national programme with twelve regional projects. Innovation Norway is the primary operator of the projects together with the Research Council of Norway and SIVA (Industrial Development Corporation of Norway). The objective of the programme is to strengthen innovation activity and knowledge creation among regional clusters and to spin the creation of new business. Whereas Arena programme concentrates on the creation of new clusters, NCE programme aims at developing and deepening collaboration within existing clusters. Participants of the clusters practice long-term collaboration in the form of concrete development projects with target to spur innovative solutions. The programme's support is in the form of financial support and external expertise in the form of professional tools and contact network.

Of the 12 NCEs, three have a clear focus on service innovation. One is focused at food traditions and development of culinary concepts to the tourism industry. Another NCE is also focused on tourism innovation. The third is a NCE focusing on the development of commerce and trade technology to the energy market (NCE Smart). The NCE Smart has got a good start and there is a good number of collaborative R&D projects ongoing within the companies in the cluster. However, the work is in start and no innovations have been commercialized yet. Collaboration is intense, though, and participating companies see the existence of the cluster as key reason for securing their businesses in the region. The NCE Tourism, on the other hand, is not an established cluster mainly due to the fact that relevant companies are to large extent small and lack the resources to participate in such collaborative work.

Research Council

The Research Council helps to create an arena for cooperation between the companies and the research community as regards the initiation, planning and implementation of research activities. Projects require at least 50% co-financing from private enterprise. In 2011 The Research Council of Norway established a Centre for Service Innovation (CSI)

as one of seven national centres for research driven innovations. The CSI partners include companies within the areas of communication, ICT, finance, logistics, academic partners and business knowledge partners specializing in innovation process management and ICT-supported service innovation. Partners also include bridging partners assisting knowledge dissemination and SME-partner inclusion.

Through bridging partners, the centre will enable more SMEs to take part in open innovation driven by the largest buyers of sub-contracted services in Norway. The CSI-board, where business partners hold the majority positions, identifies and develops research themes to be pursued, and decides which partner development projects to integrate into its research environment. The CSI's main research themes are innovations in customer and brand experiences, co-creation and open innovation process, business model innovations and infrastructure and structural innovations. The Research Council's main programmes and activities supporting innovation are each described below.

Case examples for supporting non-technological innovation: Research Council's main programmes

BIA programme

The BIA programme aims at increasing the competitiveness and performance of Norwegian trade and industry through increasing collaboration among organizations both nationally and internationally, increasing the level of business know-how among companies and spurring shared development projects with clear innovation focus. These objectives are strived with supporting research-based R&D and innovation within companies and collaborative clusters. The BIA programme provides funding for research that will result in new products, processes and services in or across a variety of sectors, regardless of branch of industry, with the exception of those areas that are covered by the thematically oriented programmes. Thematic areas for the projects include environmental technology for a more sustainable business sector, new business models, and management and organization, also in combination with technology, to name a few. (Kuusisto 2012 and The Research Council of Norway online).

RENEW Programme

The RENEW scheme intends to finance innovations spinning out of research with commercial potential. In the period 1996–2008 about 300 companies were founded through the scheme. A significant share of these companies was service companies. The scheme also supported a large number of ICT projects that include a significant service component.

SkatteFUNN

Business enterprises engaged in research and development activity on their own or in collaboration with others may apply for a tax deduction in Norway. The scheme is legal-right based and is open to all branches of industry and all types of companies regardless of their size. To be eligible for the tax deduction, the companies must be subject to taxation in Norway (although they do not have to be currently liable for taxation) and their R&D project has to fulfil certain requirements of the national tax authority.

Companies may receive a 20% tax deduction of incurred, documentable expenses under the SkatteFUNN scheme. Evaluation of the tax scheme shows that companies that have received tax credits have had a higher growth of not only R&D expenditures but also sales. Companies that have not engaged in R&D activities seem to have a higher probability of doing so after the SkatteFUNN scheme was introduced. Hence, the additionality is largest in companies that did not engage in R&D activities prior to the introduction of the scheme. Moreover, the additionally effect is larger in small companies than in large companies meaning the scheme seems to support R&D activity especially in small companies.

As in many other countries enforcing tax credit schemes, it increases business R&D and supports innovation activity. The scheme supports also productivity growth within companies. Companies that have used the scheme are more innovative and experience larger growth of productivity though return on R&D investments is higher for self-financed investments than those induced with the tax scheme. The scheme supports especially innovation activity that incurs new products, services and processes that bring along immediate gains to the companies and have short-term impacts. An interesting impact of the tax credit scheme is that it seems to support other public funding for innovation activities meaning that companies benefiting from tax credits are more likely to apply for other innovation activity supporting grants. This might be because when becoming familiar with the SkatteFUNN scheme, companies become aware of other support opportunities. (Cappelen et al. 2008).

SFI Scheme

This scheme encompasses Centres for Research-based Innovation (SFI) in which enterprises participate actively. The centres were established in 2012. The purpose is to build and strengthen Norwegian research groups that work in close collaboration with partners from innovative industry and innovative public enterprises. The scheme supports long-term industrially oriented research and is expected to enhance technology transfer, internationalization and researcher training. The scientific quality of the research has

to be of a high international standard. The centres are co-financed by enterprises, host institutions and the Research Council. When the centres are established, they are given a contract for five years. Based on a successful midway evaluation, the contract may be extended for another three years. (Kuusisto 2012 and The Research Council of Norway 2015).

One of the centres focuses on service innovations. It was established in 2010 when the already existing Centre for Service Innovation obtained the status of a SFI centre. The centre focuses on the innovation challenges facing the service sector. The main themes of the centre are business model innovations, service design and organizational development. The centre is performing relatively well within these themes but has failed so far to unite these themes to produce real service innovations. The evaluation therefore recommends the centre to enforce the presence of industrial experience in its management team to bring some industrial perspective and support the delivery of world class research results within service innovations. (The Research Council of Norway 2015).

The scheme has been evaluated after having operated for three and a half years. Generally speaking, the centres have delivered impact to their participating partners and collaborators despite the short existence. Those centres that do not involve industry, research institutes and academia according to the original vision of the scheme tend to have less impact. Hence, the involvement of all these three sectors seems to be crucial for the performance of the centres. The performance of the centres is relatively heterogeneous with the most successful ones having clear infrastructure and demonstrating strong leadership. Those centres that operate on a freer basis generally have missed some opportunity to increase international visibility and do not benefit from international insight as much as they could. Therefore, clear leadership roles and strong management are vital for successful results. (The Research Council of Norway 2015).

Learning points

Norway has enforced several programmes with aim to increase collaboration between research and business. Many of these programmes are very concrete and promote innovations at the business level in the form of concrete development projects between companies and research organizations. The programmes have been systematically evaluated meaning there is evidence on the results and impacts of the programmes. The development projects realised within the programmes are often realised within a specific sector and according to evaluations they seem to be effective in the sense of increasing collaboration and innovation activity and promoting growth at the firm level.

6.5 Case Denmark

Role of non-technological innovation in innovation policy

Denmark was one of the first countries to introduce national design policy in 1997. The aim was to increase design awareness in Danish SMEs as well as the public sector. This policy strengthened the role of The Danish Design Centre, which had been established already in 1978. With a new building in the centre of Copenhagen, the Danish Design Centre and design in general received a more prominent role in the society.

An example of the policies implemented by the national design policy is the Icebreaker Scheme, which was in force 1998-2001 and through which 450 SME design projects received government grants. Some 120 companies and organizations participated in the programme, which had an annual budget of 1 million euros. The aim of the scheme was to give small businesses incentives to use a designer associated with a development project. Companies participating in the programme received a salary subsidy of 50% when hiring an in-house designer for at least two years. Evaluation of the programme shows that 90% of the companies participating in the programme were satisfied with the scheme and found it reinforcing their competitiveness. Some 40% of the companies indicated they would continue employing the designer after the end of the scheme. (Scherfig et al. 2010, TEM 2014).

The national design policy was reformed in 2003. This reform brought changes to the Danish Design centre, which was developed into a national centre promoting design and thereby it finally in 2005 received a financially legitimized status with annual public funding. Previously the centre was financed with private money. Focus of the centre was to promote international branding of Danish design and to enhance interaction between designers and businesses. An example of concrete activities was the Design partner programme, which aimed to integrate design with innovation processes and business strategies in large companies. (Scherfig et al. 2010, TEM 2014).

In 2007, a new design initiative was launched where the national design policy focused on creating larger design companies with multidisciplinary competencies to better meet industry demand and increase export activities. Thus, the policy aimed at the internationalization of design companies (Design Denmark). This strategy was adopted partially to fight back the development of shifting manufacturing to low-cost countries (TEM 2014). Moreover, the new initiative focused on recognizing and making public pioneering companies in the use of design in various industries to showcase lead companies. It was thought that

companies not known for the use of design would better integrate design in business strategy by following lead examples. (Scherfig et al. 2010, TEM 2014).

This strategy led to the introduction of a programme focusing on the promotion of user-driven innovation, where 16 million euros were targeted on the development and testing of user-driven methodologies. The programme is described in more detail below.

Danish design policy is seen practical and it focuses on the commercialisation of new solutions. (TEM 2015). In 2011 the government appointed a committee to further promote design, Danish Design 2020 Committee, whose vision is that design will be present in all aspects of the society (Danish Enterprise and Construction Authority 2011). In 2013 the Danish government established eight growth teams of which one focuses on creative industries and design. The action plan addressed the importance of creative industries in design policy and published a plan for growth in the creative industries. The plan addressed business potential and research resources within creative industries. (The Danish Government 2013).

The development of service business

Still in the beginning of the 2000s, the Danish innovation policy was fragmented with no centralized innovation policy framework supporting the efficient use of new knowledge and research results with commercialisation potential. The Danish innovation system was argued to suffer from a low level of interaction between knowledge institutions and businesses. In 2005 the Danish government moved innovation policy and the coordination of the innovation system to a prominent position on its policy agenda. A Globalisation Strategy was launched in 2006 addressing the competitiveness of the economy in general. The strategy concentrated merely on promoting R&D activity in large high-tech companies.

A strategy plan called 'Innovation Denmark 2007–2010' was launched in 2007 to address and promote service innovations by setting up a clear strategy for service innovations and concrete goals to support innovative performance in the service sector. The objectives of the programme were to increase partnerships between research and business units and to increase the participation of Danish companies in innovation networks and international development projects. As part of the programme some demonstration projects were realised to develop public services with methods of service design. (Bloch and Aagaard 2007, Kuusisto 2012, Scherfig et al. 2010). The Innovation Denmark programme was followed by Innovation Denmark 2010–2013, which continued the work of its predecessor and aimed to increase participation of Danish companies in innovation networks and international development projects. (Kuusisto 2012).

Typical to the Danish national innovation policy is that there are no specific innovation programmes targeted at services. Rather, innovation programmes are sector neutral and all innovation programmes are seen as potential support methods for service innovations. Another key feature of Danish innovation policy is that large scale quantitative impact assessments of innovation programmes are done regularly. This means there is evidence on the effectiveness of innovation programmes and initiatives. Below are presented the main government funded programmes promoting service innovations and business innovations in more general that have been found to be effective and had a real impact on innovation activity in the Danish society. In addition to the programmes described below, the Danish government has initiated numerous other programmes to support innovation activity.

It should be noted that in addition to public funding directed to companies' development projects, R&D activity at companies is supported by a tax credit scheme introduced in 2012. It provides companies with a negative balance sheet to obtain a credit for their R&D expenditures. This way it supports newly established firms in growing and starting up their business. (OECD 2014).

Case examples from non-technological innovation – design

UDI Denmark

The programme was established to promote the development and testing of user-driven methodologies in companies. The focus of the programme was in SMEs as the previous programmes had put more emphasis on large companies. The objective was to activate SMEs to use design methods and design in their business strategies. Furthermore, the programme aimed to increase the level of collaboration between companies and research organizations. The programme funded over 80 projects realized in companies and research units. Companies could apply for grants in 2007-2009 (the programme focused on methodologies, not concrete outcomes). (TEM 2014).

The Ministry for Economy decided to allocate funds through advisory boards formed by private sector actors which led to funds being allocated in small amounts to various sectors. The funds failed to create strong R&D networks or clusters. It led to large number of small projects. Funds were allocated for example to small design and marketing companies.

In parallel with UDI, a programme called EDI (employee driven innovation) was established to support innovation competences in companies. EDI was targeted to support innovation in small companies which rarely have resources for R&D or collaboration with universities. (TEM 2014).

There have been various evaluations on the effects of UDI and EDI. Very few patents or implemented solutions resulted from the programmes. This is not in itself a surprise as these were not listed as objectives of the programmes. The objective of the programmes was mostly to develop competences related to the use of user-driven innovations. This means that the results of allocated funding were not part of funding criteria which led to funding being allocated merely to new try outs with no clear targets in practice or results. The results were, thus, smaller than expected. The programmes did not succeed in creating cooperation between research and business units. (TEM 2014).

Companies that benefited most of the programme were either small companies focusing on design and communications services, which have interest in developing user-driven methodologies, or medium size and large companies, which have resources and know-how to apply for this type of external funding. Small companies operating in various sectors tend to develop this type of competences with trial and error methods together with their customers. (TEM 2014).

The lesson learned is that better results are achieved with long-term projects carried out by strong and large conglomerates or groups rather than by dividing the budget for various small short-term projects realized by different actors and companies. To prevent fragmentation of funding it is best to ensure that the planning and execution of this type of programmes is done by the same actor. If the purpose is to create new solutions and revenue generating business models, it should be noted that the projects entail the development of such business models. Developing methodologies and know-how does not entail new business models as such. (TEM 2014).

Case examples of non-technological innovation support – service and business innovations

Industrial PhD programme

Denmark has had several programmes that have supported companies hiring high-skilled labour. The Industrial PhD programme provided a wage subsidy to enterprises hiring PhD students to work with a PhD project related to a development project in the company. Additionally, similar programmes, Danish Knowledge Pilot and Innovation Assistant Programme provided a public grant of maximum 20 000 euros to SMEs hiring academics or graduates. Danish Knowledge Pilot and Innovation Assistant Programmes have not been found to have increased performance (profits, survival rate or employment) of participating companies (although there are some mixed effects in different studies for Innovation Assistant Programme, see Christensen et al. 2014) whereas Industrial PhD programme has been found to increase labour productivity in SMEs. However, the pro-

gramme was not found to have any statistically significant effect in large companies. Results for patenting activity, employment and firm growth are mixed and depend on study conducted. (Christensen et al. 2013 and 2014).

EUREKA

EUREKA is a publicly funded European wide inter-governmental network and a policy instrument with an aim to enhance European competitiveness by fostering innovation-driven entrepreneurship in Europe, between small and large industry, research institutes and universities. EUREKA is an open platform enabling international cooperation in innovation and present in over 40 countries. Policies supporting R&D are realized and funded nationally. Policies include direct enterprise grants to support the creation of networks between research units and companies. The programme has been found to increase exports, turnover, employment, growth and employment productivity within participating enterprises. (Christensen et al. 2013, Danish Agency for Science, Technology and Innovation 2011a).

Innovation consortia

This programme provides public grants to large research collaboration projects between several enterprises and research institutions and technology institutes. The parties develop together new knowledge or technology that is beneficial for both parties. Public funds cover the expenses of the knowledge institutions. Companies fund their part of the work meaning the programme provides no direct public grants to companies. The programme has been found to have positive and statistically significant impact for SMEs with respect to labour productivity, patenting activity and employment. None of the impact assessments conducted show impact on total factor productivity or on large companies. (Christensen et al. 2013 and 2014).

The Knowledge Coupon Programme (innovation vouchers)

The Knowledge Coupon Programme is targeted to SMEs to increase the use of research on business development. The coupon supports the acquisition of business knowledge providing companies a grant to buy consultancy services or business knowledge worth of 13 500 – 67 200 euros per company. The condition for the support was that it must not exceed 40% of the total budget of the innovation project. Another condition was that cooperation with the knowledge institute has to be organized in a form of a concrete development project benefiting business development. The budget of the programme was 2,7 million euros per year. The programme has been found to have a positive and significant effect on productivity of participating companies. (Christensen et al. 2014).

Innovations Network Denmark Programme

The programme supported the establishment and running of informal cluster and network organizations. The programme aimed to form a platform enabling cooperation between companies, knowledge institutions and technological service institutes. The networks worked within a focus area of their choice. The networks main function was to strengthen interaction in research, innovation and technology development within public and private sector by providing a network of scientists, users and companies as well as opportunities to identify collaboration partners and projects. The objective was to create permanent national networks, which have pools for innovation projects. No public funding in the form of grants was involved in the programme. Public support was merely providing a platform for cooperation and networking. The Danish Agency for Science, Technology and Innovation supported and co-financed 22 national innovation networks of which three have service sector growth as their primary focus. (Christensen et al. 2013, Kuusisto 2012).

Learning points

Several impact assessments have analysed the effects of cluster participation on companies. Innovation networks and clusters have been found to increase statistically significantly the likelihood of new innovations in participating companies (likelihood increased by 300 %). It has also been found that companies participating in the network are 4,5 times more likely to innovate than otherwise similar companies not belonging to the network. Also, companies participating in networks have four times higher probability of entering R&D focused collaboration. (Christensen et al. 2013; Danish Agency for Science, Technology and Innovation 2011b).

Another study has looked at innovation clusters in a broader sense and analysed the impact of participating in the clusters when clusters include, in addition to the above-mentioned, more regionally oriented innovation networks and to some extent more formal networks. The results of the study are based on an in-depth qualitative analysis of a survey where companies have been asked short-term (two years) outcomes or expected outcomes of participating in the clusters. The results show that participation in clusters increases innovative activity within companies. This result is stronger in small companies compared to large and medium sized companies. An interesting result is that clusters contribute more to product development than process development. Moreover, the impact of clusters is largest when the company has participated in collaboration projects with knowledge institutions. The survey indicates that participation in conferences, workshops and other networking events is especially important and value-creating for small

enterprises, which are more dependent on receiving external knowledge input. (Danish Agency for Science, Technology and Innovation 2015).

In general, the Analysis of the Danish Research and Innovation System Report (2014) suggests that companies participating in the programmes grew on average 2,5% faster than ones not participating in the programmes. Innovation Networks, Innovation Voucher and Innovation Assistant were found to increase growth of participating firms and to have a strengthened the effect for SMEs. The study included companies that received support from different innovation support programmes within the period 2000–2009.

Concluding, the lesson from Danish innovation support programmes is that programmes which increase cooperation between companies and preferably also between companies and knowledge institutions seem to be likely to have a positive effect on participating companies. There have been numerous instruments and schemes in Denmark supporting knowledge exchange and cooperation between companies and knowledge institutions or experts. This cooperation seems to be fruitful. It seems also that SMEs benefit most of these programmes. Programmes that have not been found to impact companies' innovation activities are, if generalized, programmes which have supported R&D activities of companies on their own.

6.6 Case Australia

Role of non-technological innovation in innovation policy

Australia is a large federation with four to six larger regional areas for innovation. Service innovation or non-technological innovation has long remained out of the focus. Most of the activities have been company-led. In the Australian surveys for companies most companies and especially SMEs are seen rather innovative and process innovation (innovation of managerial practices) and innovation of marketing methods have been seen as frequent as any process or product innovations (Australian Innovation Systems reports summarize these findings).

Powering Ideas: An Innovation Agenda for the 21st Century from 2009, is a ten-year plan to strengthen Australia's national innovation system. It outlines a framework for increasing the effectiveness of Australia's innovation efforts and fostering future productivity improvements. The current governments IdeasBoom is the equivalent new strategy. Even though services and service innovations are not explicitly mentioned it is embedded in all key priorities including more innovative firms, increase of firm R&D spending and business research collaboration.

Data from the National Innovation System report shows that innovative SMEs are more likely to report lack of skills as a barrier to innovation than large firms. The lack of skills represents a barrier to innovation by industry sector in the surveys. Consistently, across all industry sectors with the exception of electricity, gas and waste services, innovation-active companies are more likely than non-innovation active ones to indicate a lack of skills as a barrier to innovation. Innovation active firms in transport, postal and warehousing, manufacturing, and agriculture, forestry and fishing are the industry sectors that show the highest proportions of innovation activity at 36–37 %. Retail sector is arguing to have least skills gaps for innovating, which is also reflected in our evaluation interviews. There has been constant call for more research on service sector innovation as part of the Australian national innovation system (i.e. Couchman 2008).

Government spending on R&D has been somewhat decreasing. Despite the decreases, government still plays a critical role in financing the innovation system through the funding of research organizations such as universities, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Defence Science and Technology Organisation. Total Australian Government support for science, research and innovation has grown in nominal value from 4,2 billion dollars in 2000–2001 to 10,1 billion dollars in 2013–2014, an increase of 140 %. However, the share of government funding to government research agencies has fallen from 35% in 1990–1991 to 19,4% in 2013–2014. The business enterprise sector has been the major beneficiary of this redirection, with its share of Australian government support increasing over this period from 18,6% to 32,1 %. The majority of this comes through a five-fold growth in the value of the tax incentive for business R&D. (Australian Innovation Policy Report 2015).

Continuing research initiated in the early-1990s (but discontinued by the late-1990s), the Australian Bureau of Statistics (ABS) conducted two surveys of innovation in Australian businesses, covering the two-year periods 2002–2003 and 2004–2005. These two surveys provided snapshots of innovation activity in Australia and revealed that innovation was occurring throughout the economy and across all industries, innovation in goods and services was lower than both process and organizational or managerial innovation in most industries, expenditure on innovation varied markedly across industries (and was highly concentrated in a relatively small number of businesses), and total innovation expenditure by firms involved high levels of non-R&D expenditure. It was also found that the proportion of innovating businesses had increased between the first and second surveys (i.e. from 29,6% to 33,5 %), and that such an increase had occurred in all industries except communication services and finance and insurance. (Couchman 2008).

Key players in supporting non-technological innovation

Australia Council for the Arts is a key player in relation to design. However, most of the activities in Australian innovation policy relating to design is led from the design community. Australia has had a call for a national design policy in 2010s, but so far has not been able to implement one. There is currently no national policy for design, however, the draft National Cultural Policy that was releazed for consultation by the government in 2011 considers the policy for the design sector as one of the creative industries.

The Department of Industry, Innovation, Science, Research and Tertiary Education manages the governmental innovation policy. The department develops policy and research and supports innovation. Federal states also play a role in managing many commonwealth schemes. Office of the Chief Scientist is responsible of the research. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is the national science and innovation Agency.

As of July 2016, Innovation and Science Australia (ISA) will be the new independent body responsible for strategic whole of government advice on all science, research and innovation matters. ISA will complement the Commonwealth Science Council, which will continue to advice the government on high level science challenges facing Australia. It incorporated the Innovation Australia tasks.

The current Innovation Australia (the Board), is an independent statutory body established under the IR&D Act to assist with the administration and oversight of the government's industry innovation and venture capital programmes delivered by AusIndustry. The board's responsibilities include registering, monitoring and revoking the registrations of Venture Capital Limited Partnerships (VCLP) and Early Stage Venture Capital Limited Partnerships (ESVCLP), administration, monitoring and operation of the R&D tax incentive, strategic oversight to the Entrepreneurs' Programme (EP) and several others.

Ministerial Directions issued by the Minister for Industry and Science to Innovation Australia in 2015 direct the board to carry out additional functions. These are to oversee the delivery and performance of programmes, which Innovation Australia has from time to time been directed to be responsible for by separate Ministerial direction under sections 18A, 19 and 20 of the IR&D Act ('the Programmes'), to maintain the integrity of the programmes in accordance with relevant assurance framework, and cooperate with any independent evaluation of them, and to promote the benefit and awareness of the programmes as well as monitoring uptake and impact. In addition, an additional function is to collaborate with the Growth Centre Advisory Committee to support each of the four themes of the Industry Growth Centres programme, and jointly provide the consultation

mechanism for the Minister required under the Government's Industry Innovation Competitiveness Agenda including deregulation.

Approach on innovation policy on services – promoting business innovation

In 2008, Australia innovation policy was reviewed and first times service companies were entered to current innovation policy schemes. It pointed out that the current suite of government market facing programme assistance should be designed to focus on building the capacity of companies to absorb and incorporate new knowledge, facilitating collaboration – especially between companies and universities and publicly funded research agencies, and improving capital market development.

In the 2008 review and Australian strategy, process innovation is the top word that is used in contrast to product-led technological innovation. However, the review focuses on the issues relevant for non-technological innovation and service innovation: "It is the non-technological innovation that occurs and transforms businesses as they engage with their customers and markets. This market-facing business innovation is often overlooked and undervalued. But if it is ignored, Australia squanders an opportunity to make the productivity gains we need to maintain our prosperity and living standards." (Howard Partners 2008, p. 30).

The April 2008 report by the Prime Minister's Science Engineering and Innovation Council (PMSEIC) Working Group on Services Innovation, Science and Technology, which led Australian industries identifying two modes of services innovation:

• innovation in services industries, where innovation is either applied to an industry regarded as service-based, or results in a new service-based industry such as water monitoring services, internet service providers, or innovative uses of IT and digital imaging by hairdressing businesses; and

• innovation through services in any organization or business where the application of a service results in innovation in an industry generally not classified as services, such as the use of sonar, GPS and remote sensing satellites to enhance the location, harvesting and productivity of the fishing industry.

In the past, however, the overwhelming focus of Australia's innovation policy has been to increase the supply and commercialisation of research, scientific discovery and technological advances. Relatively little attention has been paid to policies for improving the capacity of firms to absorb and apply the products of this increased supply of science and research, nor to understanding how the needs of markets and customers are served and the productivity effects are secured for the Australian community.

Many of the public policy documents and the Innovation policy review suggest that business innovation should be the focus of Australia's innovation system. This means that the companies should have innovation as a decisive business strategy and additional resources should be available for innovation support programmes designed specifically to increase the innovation competencies of business enterprises at the point of engagement with customers and markets and to create opportunities for innovation through knowledge-sharing and collaboration. Also, better measurement of Australia's business innovation and performance and productivity outcomes is needed.

One of the main goals of the review was to build new target setting to support business innovation as an explicit priority for Australia's innovation policy by incorporating objectives into programmes aimed at building business innovation capacity. This meant assisting the generation and absorption of business knowledge by private firms, helping private firms to secure returns and to appropriate value from undertaking inherently uncertain innovative business activities and fostering the capacity for innovation at the company level in response to market and customer demands. Further, it meant facilitating economically useful connections between firms and other institutions for knowledge transfer and capability building and extending the global reach and market access of Australian firms; and increase the managerial, technical and collaboration skills and competencies of private companies.

One of the recommendations was to extend the Enterprise Connect programme to include service companies and to expand it to provide explicit business innovation services in conjunction with the existing business review and advisory services. The recommendation 3.3: Establish a new Knowledge Connections programme within the Enterprise Connect Program, to work with Industry Innovation Councils in facilitating new connections and clusters crucial to the competitive advantage of firms in knowledge-based economies was implemented. (Howard Partners, p. 36).

One very specific nature of the Australian system is an extensive notion of public sector service innovation and public sector as one of the key drivers of service innovation (Howard Partners, p. 36). This is partly explained with the long tradition where commonwealth works as an innovative buyer and many of the sectors (i.e. welfare services) are largely outsourced or even privatized (see Considine and O'Sullivan 2015). The Australian Innovation policy focuses also on innovation in firms, also including service companies, process innovation, and access to capital.

Case examples for supporting non-technological innovation

When looking at the Australian service and business innovation landscape, three types of measures can be identified. These are, first, strategies supported with small scale initiatives, second, different innovation programmes with strong focus mainly on the early phases of the research commercialisation chain, and finally, industry-led networks and competitions to drive design, business research or services.

Since the innovation policy review, Australian government has published an innovation policy report and an innovation systems report on a yearly basis. Innovation policy report lists different types of innovation policy measures and initiatives launched by different federal departments. Quick analysis of these reports show that relatively little attention is focused on the themes of services, design or business management as such, but these themes are embedded instruments.

As pointed out by Australian Researchers Drawing on information and analysis collected for a major review of Australia's NIS, and the government's ten-year plan in response to it, we show how the free market trajectory of policy-making of past decades is being extended, complemented and refocused by new approaches to complex-evolutionary system thinking. These approaches are shown to emphasize the importance of systemic connectivity, evolving institutions and organizational capabilities. Nonetheless, despite the fact that there has been much progress in this direction in the Australian debate, the predominant logic behind policy choices still remains one of addressing market failure, and the primary focus of policy attention continues to be science and research rather than demand-led approaches. (Dodgson et al. 2011). This has led to the situation where different industry advocates, industry associations or chambers play a great role in organizing development activities.

Innovation programmes and service, business competencies and design within them

In the recent review, 221 programmes supporting innovation in firms were identified, comprising 31% Australian government and 69% State and Territory Governments. Australian Government programmes account for 90% of the total expenditure for these programmes, approximately 3,7 billion dollars per annum. There is some apparent intra- and inter-jurisdictional overlap in programmes but this is neither systemic nor likely to have a significant impact. Many programmes are targeted to leverage o other programmes. Only 36% of the programmes have been reviewed. Many programmes have unclear or unmeasurable key performance indicators. The role of service business and service innovation is rather limited. (SBC/NSBC 2015).

One of the initiatives delivered by the department is Enterprise Connect. Enterprise Connect is provided by different agencies and consultants supporting the enterprises for developing their services, business models or design. The combination is mixture of what used to be DesignStart in Finland and wider projects. Enterprise Connect was extended to service companies and many local and federal service specialists were procured to provide business advice for service firm innovation. Enterprise Connect was replaced in 2016 with Entrepreneurship Programme.

The Entrepreneurs' Programme drives business growth and competitiveness by supporting business improvement and research collaboration in targeted growth sectors and the commercialisation of novel products, processes and services. The Programme has four elements business management, innovation connections, accelerating commercialisation, and Northern Australia tourism.

The primary focus of the programme is on providing access to the best advice and networks to help businesses solve problems, rather than focusing on financial assistance. From the focus sectors business management is relevant for Liito. Tourism is one of the largest service sectors in Australia.

Rather new example is Business Research and Innovation Initiative (BRII). The initiative will be launched in 1st of July and focuses on identifying national policy and service delivery challenges and innovative businesses will be invited to submit proposals to address those challenges and the winners will receive grants of up to 100 000 dollars to test their ideas over three to six months of development. The most successful ideas may be eligible for a further grant of up to a million dollars to develop a prototype or proof of concept over the following 18 months.

Under the BRII, government will identify important policy or service delivery challenges. SMEs will then have the opportunity to compete for grants to develop innovative solutions to them. The BRII is set to launch with five challenges to be announced in mid-2016. Following this SMEs will be invited to submit an application addressing one of the five challenges, with winners receiving grants of up to 100 000 dollars to undertake feasibility studies over a period of up to 6 months, SMEs with the most promising ideas may be eligible for a further grant of up to 1 million dollars to develop a prototype or proof of concept over a period of up to 18 months. The Government has already made substantial progress on implementing the BRII. This includes consultations with several state and territory governments to learn from their experiences delivering similar programmes, ongoing development of a process for identifying the most worthwhile challenges, and drafting of programme guidelines and other documentation to ensure the effective and efficient delivery of the programme.

Many of the specific programmes for related innovation are available in certain regions, but are based on the commonwealth principles. These federal programmes are quite well targeted and specific. Evaluation evidence of these programmes is quite limited. Some examples are:

- **South Australian Business Model Innovation Programme** is a programme for manufacturing businesses in South Australia, which helps one to explore innovative new business models designed to value add and complement existing manufacturing capabilities and create new products and services around manufacturing.
- **Innovation Connections is part of the Entrepreneurs' Program** and targeted to SMEs. It is available in several federal states. Innovation Connections has a facilitator approach and grant approach for research placement. Service companies are also welcomed to participate, however, the statistics of this are unavailable.
- **Tasmanian Arts Bridge Provides funding for airfares (or freight) to** ensure that artists may take advantage of opportunities afforded them (such as invitations interstate or overseas) even if the opportunity occurs after the relevant grant round closing date.
- **Business Innovation Support Initiatives (BISI) Grant Scheme** provides support for a Northern territory business undertaking R&D projects in the areas of science, engineering, technology and design. It is targeted to companies below 100 employees. It also funds voucher or grant scheme for design advisors for the companies from 25 000 to 50 000 dollars.
- **WA: Commercial Development Programme** supports small scale projects for creative industries to develop commercial potential, business viability and extend ending market reach for companies with less than 10 employees.

Most of the state level initiatives are either voucher or grant support for advisory services or "employee placements".

Industry-led support networks and other measures

The main learning point of Australian innovation support for service, design and business competencies, is it being sector- and industry-driven. One launching point goes back to 1993 when BCA (Business Council of Australia, representing biggest 100 businesses in Australia) released "Managing the Innovating Enterprise", a landmark publication on business innovation in Australia. The report aimed to promote acceptance of the concept of innovation as a practical business issue for Australian business. The BCA undertook the research because it was concerned at the time that there was a general lack of understanding outside business circles of what it meant to be innovative in business, about the processes of innovation in businesses and about the factors that determined business innovation success. This led to different national initiatives with larger impact on innovation policy, i.e. national innovation summit or Backing Australia's Ability programmes (BCA 2015).

Even though the Australian schemes focus on how the innovation appear in businesses and how services or business models are innovated within this context, BCA sees that business innovation requires systematic activities such as undertaking market research and using market, information to tailor products and services to create additional value for customers, purchasing and using capital goods and equipment in production processes, integrating or recombining existing forms of knowledge and technology to create new product and service offerings, as well as business R&D activities.

Besides the general strategies, different organizations in Australia have vivid competition landscape, which is supported by different societies and innovation organizations. Australian Service Science Society has, for example, Service Innovation Award, which is instituted to recognize organizations that have demonstrated significant innovation in the service sector. In addition, there is an award for public service innovation and co-design managed by the Australian Centre for Social Innovation and also supported by the department.

Federal states also have state specific sectoral initiatives for societal problems, such has mental health. For example, in 2015 New South Wales started a 4-million-dollar fund to drive innovation in mental health care and psycho-social supports for people with mental illness, their families and carers. The fund will finance innovation projects to improve mental health outcomes to help people with mental illness and their families to live a better life.

In design there are different industry focused organizations. The Australia Council considers applications from artists who work in the area of "object design" as eligible for the general visual arts grants programmes. The National Association for the Visual Arts (NAVA) is a key organization that receives triennial funding from the Australia Council. NAVA has been instrumental in establishing the Australian Design Alliance – a new strategic partnership of Australia's peak design bodies across a range of disciplines, including design, architecture, urban planning, craft and the arts. (Australian Design Alliance online).

Based on Australian research, only limited attention has been paid to the issue of new service development (NSD) in cross-national context. To address this critique of the literature, a comparative cross-national study of NSD strategy and process of financial service firms in Australia and the USA was conducted. The study employs a cross-sectional, survey-based methodology. The US sampling frame included 274 large financial service firms situated in the Northeast region of the USA. The Australian sampling frame consisted of 262 firms situated in the Southeast region of Australia. The data pattern suggests that the firms

in both the countries use different new service strategies to compete in the industry and emphasize different sets of development stages in developing new services. (Alam 2006).

Learning points

Australia lacks the same kind of public funding agency and centralized approach to public support for new innovation themes such as service innovation, design or business management. Despite this, the innovation policy approach is very company-centric. This is as well because the service research and research on design is rather limited. However, in many themes Australia's companies are behind their Finnish counterparts. Still, there is something to learn on very business-driven innovation policy focusing on business innovation with very sectoral approach.

All key schemes (Enterprise Connect, Entrepreneurs' Programme, most of the early stage capital funds managed Innovation Australia) have also been open to service companies. Specific targeted actions have been set for tourism.

Those schemes that provide connection with the intermediary organizations (consultants, designers etc.) have also support for design advice as part of the programmes. However, it may not be specifically marketed or largely used. However, this embedded approach is something currently difficult to pinpoint from the Finnish innovation funding landscape.

6.7 Case Germany

Role of non-technological innovation in innovation policy

In Germany, the approach to service innovations is relatively active and systematic at the federal level. The German research scene is, however, extremely diverse and complex and there are multiple stakeholders to service innovations. This feature has also highlighted the need for coordinating different activities around innovations. Similarly, integrating different actors and political levels connected to the innovation system has been an ongoing process in the country.

As one measure to support the integration of diverse activities, Council for Growth and Innovation was set up in 2006. It ceased already in 2008. The council included members from politics, science and industry, and its task was to advice the Federal government in all issues related to innovation policy. It further had a subgroup that specifically focused on service innovation issues. (Kuusisto 2012).

The German attention to service innovations has to a large part been in research support to develop new knowledge and research competences (Forfas 2014). One of the first moves towards a more service-oriented view took place in mid-1990s when the Ministry of Education and Research launched Initiative on Services for the 21st century. The goals of the initiative included supporting the development of the services sector, encouraging a more positive attitude towards research and promoting networking with different economic sectors of the economy. (UN 2011). The initiative also responded to the observed lack of service mentality in the traditionally strong industrial economy (EPISIS Task Force 6 2012).

Initiative on services for the 21st century has been noted for setting up systematic and practical tools for the planning of service operations, as well as for the standardization of service processes. Moreover, the initiative increased awareness on services engineering, which has since then been a well-known concept in research institutions and companies. (EPISIS Task Force 6 2012).

In 2006, the Federal Ministry of Education and Research kicked off a service research programme Innovation with Services, which received a total funding of 70 million euros and lasted for five years. The programme is among the most

Table 4. The landscape of executing actors in innovation and research (adapted from Kuusisto 2012).

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

important contributions to service innovations so far in the country. Its establishment intended to improve the position of Germany in the field of services, to increase the volume of service research, improve the role of services in a strong industrial economy, and to systematically develop new services and maintain the quality of already existing ones. In addition, the project had an employment perspective as it strove to establish conditions for attractive jobs. (EPISIS Task Force 6 2012, Cruysen and Hollanders 2008).

Innovation with Services had three thematic areas of activity: innovation management for services, innovation in growth sectors of Germany and human resource management in service companies. The programme was not targeted to specific industries or sectors. A guiding principle of the work was to function as a learning experience in which future project proposals are made on the basis of both ongoing projects and general trends in the service sector. (Kuusisto 2012, EPISIS Task Force 6 2012). The advisory body that reports to the ministry played a key role in ensuring the learning and adaptability of the programme (BMBF 2007). One of the key objectives of the programme was also to ensure the realignment of service research "according to economic, social and technological development" (Cruysen and Hollanders 2008).

To ensure the quality of action in the thematic areas, the programme strove to sustain cooperation between theory and practice as well as social discourse. The central element of the cooperation was research and development projects that focus on key issues of the service economy by shared participation of industry and science. On the other hand, ensuring the cooperation between research and practice also formed a key challenge for the programme implementation (Cruysen and Hollanders 2008). It was noted in the planning of the programme that the service sector is strongly presented by SMEs and the implementation of innovative service ideas in these companies requires support from appropriate research and development activities (BMBF 2007).

Around the same time with the establishment of the Innovation with Services in 2006, Germany also introduced an Industry-Science Research Alliance, which operated until 2013. The alliance was especially set up to consult the policy makers in the implementation of a German High-Tech Strategy, which still is an important innovation tool in the country and has for over ten years emphasized the important role of services in innovation. As a central inter-ministerial advisory body, the Industry-Science Research Alliance was also responsible for identifying future challenges. The body had five areas of focus: communication, security, mobility, health and nutrition, and climate and energy. Its members were high-level experts from both research institutions and industry. (Kuusisto 2012). The current High-Tech Strategy especially includes referrals to the increasing role of smart services. Germany has been a forerunner in the Industry 4.0 concept.

In relation to the High-Tech Strategy, an Action Plan Services 2020 was developed by the ministry. The action plan has been viewed as an important step in developing the understanding of the connection between service research and technological innovations and programmes. The action plan has especially addressed fields where the connection to services is especially strong. These include fields such as healthcare and mobility. The programme has also been relatively practical by nature, since it has focused on solutions and business models that suit the market and people. (Kuusisto 2012).

Since 2013, the coalition government has introduced especially three measures to strengthen the role of service innovations in research. First, the national High-Tech Strategy 2020 was updated, for example, to include integrated solutions as new forms of value creation. Second, the Federal Ministry of Education and Research (BMBF) has initiated a new key research programme Innovations for the Production, Services and Work of Tomorrow. Third, in connection to the new research programme many pilot programmes and measures have been started. (Kuusisto et al. 2015).

The Innovations for the Production, Services and Work of Tomorrow programme is a continuation for the successful project Innovation with Services and another programme called Research for Tomorrow's Production. The new programme relies especially on cooperation between science and industries as well as on interdisciplinary collaborations. The programme has been seen as another important contribution to strengthen the position of Germany in global competition. The programme includes three parts and is expected to last until 2020. (BMBF online).

In addition to the aforementioned, services are considered in many other programmes as a cross-sectional topic. In the programmes and initiatives of the Ministry of Economics and Technology, service-related research is generally implemented in relation to other industries. The Ministry of Economics and Technology is active in its support for service innovation. It is also responsible for the structural aspects of regulating service sector. (Kuusisto 2012).

Design Policies

In terms of design policies, Germany has no national policy per se. Thus, the promotion of design competences mainly takes place at the state level. Germany has, however, design centres and actors that provide design support (Whicher et al. 2015). The German Design Council was founded in 1953 from the initiative of the German Parliament. Its main tasks are to support companies in brand and design development and to communicate the value of design. The Design Council has more than 200 members from companies, associations, institutions and designers. (German Design

Council online). In addition, there is a monitoring mechanism for the culture and creative industries called the Initiative Culture and Creative Industries of the German Federal Government.

Case examples for supporting non-technological innovation

Service Innovations

At the state level there is a range of different policy approaches to support the service economy. Examples include activities to improve the mutual transfer among service economy, politics and service research, innovative networks and training and education measures. Especially the states of Baden-Württemberg, North Rhine-Westphalia and Sachsen have concrete measures to support the service economy. (Kuusisto 2012).

In Baden-Württemberg one innovation policy tool has been the use of innovation vouchers, which are meant to support the planning, development and implementation of new products, processes or services, or to improve existing ones. The vouchers have been used since 2008 and they are targeted to SMEs. The value of the vouchers starts from 2 500 euros. They can be used to buying research and development services. (Ministry of Finance and Economics Baden-Württemberg online, OECD 2011).

In addition, the strong institutional framework in the Baden-Württemberg area has been generally considered as another reason why the area has been traditionally very strong in innovating, though mainly in the area of technological innovations. For example, Baden-Württemberg is the state in Germany with the highest density of universities and, moreover, the state has a high number of other research institutes of applied research. Since the 1990s and structural changes in the economy, the region has, however, had stagnation with economic development, since the sector for knowledge-intensive business services has been comparatively underdeveloped. (Strambach 1998). The state has an innovation strategy, but it seems somewhat more focused on technological innovations. The state government has selected special areas of growth to the focus of its innovation policy. These areas are sustainable mobility, environmental technologies, renewable energies and resource efficiency, health and care, and ICT, Green IT and intelligent products. (Ministry of Finance and Economics Baden-Württemberg online).

The innovation strategy of the North-Rhine Westphalia (NRW) names its approach as universal and stresses the point that innovation is not only technological. To promote the development of such universal innovations, networking strategies are seen as essential. Moreover, the approach of the state is, as in the country in general, rather research-driven. The NRW strategy also identifies lead focus fields.

Design Policies

In the state of Baden-Württemberg there is a special Design Centre Stuttgart, which is run by the state. The centre provides information and advice around design and is especially focused on SMEs. In addition to providing support and guidance, the centre provides companies with a platform for networking and organizes exhibitions. (Design Centre Baden Württemberg online).

The Hasso Plattner Institute of Design is, in addition, an interesting, example of how design has been linked to business education. The institute was set up in 2007 to promote a special innovation culture in the country through bringing together students to small multi-disciplinary teams and combining their different perspectives. (Kang 2015).

Learning points

German approach has some resemblance to Finnish programme design in a sense that there has been quite a lot of emphasis on research programmes on services. However, federal strategies seem to place less emphasis on the service and business innovation, or design.

Service innovation, business innovation and design is supported through general innovation policy schemes that are available also for developing innovation competencies for various non-technological themes. The approach resembles the one in Australia, where territorial states incorporate service development themes with existing policies.

7
Sources

Primary material

- Interviews with steering group members and external experts: 35 interviews
- Interviews with Tekes personnel: 8 interviews
- Comparative interviews with companies not participating in the programmes: 3 interviews
- Case studies: 17 cases
- Survey for Serve projects: 35 responses (analysed qualitatively)

Secondary material (selected)

- Memorandums from programme planning
- Programme implementation reports of all programmes
- Mid-term evaluations of programmes (mainly internal reports of Tekes)
- Memorandums from programme steering groups
- Tekes project survey for Serve participants
- Yearbook from Liito, 2008 illustrating successful cases

Literature

Alam, I. (2006). Service innovation strategy and process: a cross-national comparative analysis. *International Marketing Review*, Vol. 23(3), pp. 234–254.

Alanen, A. (2006). Muotoilulla kansainvälistä kilpailukykyä. *Tieto ja trendit, July 6–7th 2006*, pp. 14–19.

Alanen, A. (2009). Pieni on kaunista muotoilupalveluissa. Available at: http://www.stat.fi/artikkelit/2009/art_2009-12-18_003.html.

Allas, T. (2014). Insights from international benchmarking of the UK science and innovation system. *BIS Analysis Paper Number 03. UK Government, Department for Business Innovation and Skills.*

Aminoff, C., Hänninen, T., Kämäräinen, M. and Loiske J. (2010). Muotoilun muuttunut rooli. Ordered by: *Luovan talouden strateginen hanke, Ministry of the Employment and Economy.*

Bloch, C. and Aagaard, K. (2007). Mapping Innovation Policy in Services Country Report – Denmark. *Paper for the ServINNO project – Service Innovation in the Nordic Countries: Key Factors for Policy Design.*

Bonner, K., Anyadike-Danes, M., Hart, M. and Drews, C-C. (2014). Localisation of Industrial Activity Across England's LEPs: 2008 and 2012. *Enterprise Research Centre, Research Paper No 15.*

Bundesministerium für Bildung und Forschung (BMBF) (2007). Innovationen mit Dienstleistungen. BMBF-Förderprogramm. Available at: https://www.bmbf.de/pub/innovation_mit_dienstleistung.pdf.

Business Council of Australia (BCA) (2015). New Concepts in Innovation. The keys to a growing Australia. *Position Paper based on a study of Howard Partners Changing Paradigms: Rethinking Innovation Policies, Practices and Programmes.*

Cappelen, Å., Fjærli, E., Foyn, F., Hægeland, T., Møen, J., Raknerud, A. and Rybalka, M. (2008). Evaluering av SkatteFUNN – Sluttrapport. *Statistics Norway, Rapporter 2008/2.*

Christensen, T., Frosch, H. and Jensen Boysen, D. (2013). Central Innovation Manual on Excellent Econometric Evaluation of the Impact of Public R&D Investments. "CIM 2.0". *Danish Ministry of Science, Innovation and Higher Education; Danish Agency for Science, Technology and Innovation.*

Christensen, T., Frosch, H. and Jensen Boysen, D. (2014). Analysis of the Danish Research and Innovation System – A compendium of excellent systemic and econometric impact assessments. *Ministry of Higher Education and Science.* Available at: http://ufm.dk/en/publications/2014/files-2014-1/analysis-of-the-danish-research-and-innovation-system_web.pdf.

Commonwealth of Australia (2010). Australian Innovation System Report 2010.

Commonwealth of Australia (2011). Australian Innovation System Report 2011.

Commonwealth of Australia (2012). Australian Innovation System Report 2012.

Commonwealth of Australia (2013). Australian Innovation System Report 2013.

Commonwealth of Australis (2014). Australian Innovation System Report 2014.

Commonwealth of Australia (2015a). Australian Innovation System Report 2015.

Commonwealth of Australia (2015b). Australian Innovation Policy Reports 2015.

Competitive Australia (2000). A study of government R&D Expenditure by Sector and Technology. *Emerging Industries Occasional paper 3.*

Couchman, P. K. (2008). Service Innovation in Australia: A Preliminary Exploration of the "Cinderella Sector". *A paper submitted for the Technology, Innovation and Supply Chain Management Stream of the 2008 ANZAM Conference.*

Cutler and Company Ltd (2008). Venturous Australia. Building strength in innovation.

Danish Agency for Science, Technology and Innovation (2011a). Economic Impact of International Research and Innovation Cooperation – Analysis of 25 years of Danish participation in EUREKA. *Innovation: Analysis and evaluation 15/2011.*

Danish Agency for Science, Technology and Innovation (2011b). The impacts of cluster policy in Denmark – An impact study on behaviour and economical effects of Innovation Network Denmark. *Innovation: Analysis and Evaluation 18/2011.*

Danish Agency for Science, Technology and Innovation (2013). Analyses of Danish Innovation Programmes – a compendium of excellent econometric impact analyses. *Innovation: Analysis and evaluation 13/2013.*

Danish Agency for Science, Technology and Innovation (2015). The impact of enterprises' participation in clusters and innovation networks. Available at: http://ufm.dk/en/publications/2015/filer-2015/danish_cluster_analysis_2015.pdf.

Danish Enterprise and Construction Authority (2011). The Vision of the Design 2020 Committee.

Danish Centre for Studies in Research and Research Policy (CFA) (2007). Denmark.

Danish Government (2013). Denmark at Work. Plan for Growth in the Creative Industries – Design.

Deloitte Ltd (2013). Embedding Design in Life. Vaikuttavuusarviointi. World Design Capital Helsinki 2012.

Design Center Baden-Württemberg online (2016). Available at: http://design-center.de.

Dodgson, M., Hughes, A., Foster, J. and Metccalfe, S. (2011). Systems thinking, market failure, and the Development of Innovation Policy: The Case of Australia. *Research Policy,* 40(9), pp. 1145–1156.

Ekos Limited (2015). Impact Evaluation: Knowledge Transfer Partnership Programme in Scotland. *Final Report for the Scottish Funding Council, 4th December 2015.*

European Union (2012). EPISIS Final Report: Policy Recommendations to Support Service Innovation. PRO INNO Paper n° 20. Available at: http://www.tekes.fi/globalassets/julkaisut/episis_final_report_policy_recommendations.pdf.

Expert Panel on Service Innovation in the EU (2011). Meeting the Challenge of Europe 2020. The Transformative Power of Service Innovation. Report by the Expert Panel on Service Innovation in the EU.

Ferreira de Sá, M., Kunst, G., Melgarejo, M., van der Linden, G. and Kadoi Peterson, R. (2011). The Impact of National Design Policies on Countries Competitiveness. Faculty of Industrial Design, TU Delft. Available at: http://www.miguelmelgarejo.com/web/works/the-impact-of-national-design-policies-on-countries-competitiveness/.

Forfas (former national policy advisory board for enterprise, trade, science, technology and innovation in Ireland, current Department of Jobs, Enterprise and Innovation) (2014). Assessment of Publicly Funded R&D&I Supports for Innovation in Services and Business Processes. Available at: https://www.djei.ie/en/Publications/Publication-files/Forfás/Assessment-of-Publicly-Funded-RD-I-Supports-for-Innovation-in-Services-and-Business-Processes.pdf.

Furre, H. and Flatnes, A. (2012). Evaluering av Arena Innovative Opplevelser. Sluttevaluering av Arena-prosjekt. *Oxford Research*.

Furre, H. and Flatnes, A. (2013). Evaluering av NCE-prosjekter etter seks år, Evaluering av tre NCE-prosjekter. Hovedrapport. *Oxford Research.*

Furre, H., Flatnes, A. and Isaksen, A. (2013). Evaluering av tre NCE-prosjekter 2013. *Oxford Research*.

Furre, H., Stiberg-Jamt, R., Hansen, T. B. Brastad, B. and Johansen, S. (2012). Mer av det gode. Evaluering av "Forsknings- og utviklingskontrakter – IFU/OFU-programmet, perioden 2006 til 2011". *Oxford Research*.

Hauser, H. (2014). Review of the Catapult network. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/368416/bis-14-1085-review-of-the-catapult-network.pdf.

Honkatukia, J., Tamminen, S. and Ahokas, J. (2014). Suomi on jo palvelutalous. *VATT Policy Brief 1-2014*.

Kang, M. (2015). Industrial Design Policies: A Review of Selected Countries. *OECD Committee on Industry, Innovation, and Entrepreneurship*.

Koskela, H. and Salminen, V. (2014). Serve Programme: Pioneer of Service Innovation. The Innovation Policy Platform, Case Study.

Kurvinen, E. (ed. 2004). Muotoilun muutos – Näkökulmia muotoilutyön organisoinnin ja johtamisen kehityshaasteisiin 2000-luvulla. *The Federation of Finnish Technology Industries.*

Kuusisto, J. (2012). EPISIS European Policies to Support Service Innovation. Final report on Task Force 6. Service Innovation Policy Benchmarking. Synthesis of results and 15 country reports. *EPISIS, Tekes.*

Kuusisto, J., Lahtinen, H., Andres, A., Rud Morgensen, T., Männik, K., Izsak, K., Keller, J., Janssen, M., Lubos, B., Stare, M., Modig, S. and MacAulay, B. (2015). Service Innovation Policy – A Benchmarking Review. *ESIC European Service Innovation Centre, Discussion Paper.*

Lehtonen, K. (2015). Muotoilu on käyttäjälähtöisen innovaatiopolitiikan väline. Available at: https://www.tem.fi/innovaatiot/kysynta-_ja_kayttajalahtoinen_innovaatiotoiminta/kayttajalahtoinen_innovaatiopolitiikka/muotoilu.

Lindström, M., Nyberg, M. and Ylä-Anttila, P. (2006). Ei vain muodon vuoksi. Muotoilu on kilpailuetu. *Elinkeinoelämän Tutkimuslaitos ETLA,* B 220. Available at: http://www.etla.fi/files/1852_b220_ei_vain_muodon_vuoksi.pdf.

Lusch, R. and Vargo, S. (2006). Service Dominant Logic: Reactions, Reflections, and Refinements. *Marketing Theory,* 6(3), pp. 281–288.

Lusch, R., Vargo, L. and O'Brien, M. (2007). Competing Through Service: Insights from Service-Dominant Logic. *Journal of Retailing,* 83(1), pp. 5–18.

Miettinen, S. (2014). Johdanto – nyt on muotoiluajattelun aika. In Satu Miettinen (ed.): Muotoiluajattelu. *The Federation of Finnish Technology Industries*, pp. 10–19.

Ministry of Employment and the Economy (TEM) and the Ministry of Education and Culture (OKM) (2012). Design Finland Programme. Proposals for Strategy and Actions. Available at: https://www.tem.fi/files/39560/design_finland_programme.pdf.

Ministry of Employment and the Economy (TEM) (2014). Käyttäjälähtöinen innovaatiopolitiikka neljässä maassa. *Ministry of Employment and the Economy publications 3/2014*.

Ministry of Employment and the Economy (TEM) (2015). Muotoilun hyödyntäminen ja vaikutukset yritysten kilpailukykyyn. *Ministry of Employment and the Economy publications 58/2015*.

Mutanen, U-M., Virkkunen, J. and Keinonen, T. (eds. 2006). Muotoiluosaamisen kehittäminen teknologiayrityksissä. *The Federation of Finnish Technology Industries*.

Newby E. and Suni J. (2012). Palveluiden viennin viimeaikainen kehitys. *Bank of Finland Online 13/2012*.

Norwegian Ministry of Children and Equality (2009). Norway universally designed by 2025. The Norwegian government's action plan for universal design and increased accessibility 2009–2013. Available at: https://www.regjeringen.no/globalassets/upload/bld/nedsatt-funksjonsevne/norway-universally-designed-by-2025-web.pdf.

Nørve, S., Knudtzon, L., Lund Iversen, M. and Dotterud Leiren, M. (2010). Universell utforming som strategi. Evaluering av Regjeringens handlingsplan for økt tilgjengelighet, *NIBR-rapport 2010:11, Norsk institutt for by- og regionforskning*.

OECD (2006). Innovation and Knowledge-intensive Service Activities. *OECD Publications.*

OECD (2011). OECD Regions and Innovation Policy. *OECD Reviews of Regional Innovation, OECD Publications.*

OECD (2014). Denmark. In OECD Science, Technology and Industry Outlook 2014. *OECD Publications.*

Paavola, H. (2014). To Serve and Succeed – Palveluinnovaatioita ja edelläkävijöitä. Serve – Palveluliiketoiminnan edelläkävijöille -ohjelman loppuraportti. *Tekesin ohjelmaraportti 06/2014.*

PDR – The National Centre for Product Design and Development Research (2014). Service Design and Innovation, Knowledge Transfer Project for Wales 2010–2013. Project Report.

Pitkänen, A., Cheng, H., Harju, A., Jonkka, J., Keinänen, K. and Salo, M. (2012). Design ROI – Mitattavaa muotoilua, Design ROI -projektin loppuraportti.

Prime Minister's Office Finland (2000). Valtioneuvoston periaatepäätös muotoilupolitiikasta. Available at: http://www.taike.fi/documents/11544/0/MUPOLI_SUOMI_(EDM_14_2656_3639).pdf.

Ruopila, S., Haila, K. and Keinonen, T. (2009) Design Forum Finland muotoilun hyödyntämisen edistäjänä. Arvioinnin loppuraportti. Available at: https://www.tem.fi/files/23455/DFF_Loppuraportti_NetEffect_FINAL.pdf.

Sandström, S., Edvardsson, B., Kristensson, P. and Magnusson, P. (2008). Value in use trough service experience. *Managing Service Quality: An International Journal,* 18(2), pp. 112–126.

Scherfig, C., Brunander, M. and Melander, C. (2010). From the World's First Design Policy to the World's Best Design Policy. *Design Management Review*, 21(4).

Strambach, S. (1998). Knowledge-intensive business services (KIBS) as an element of learning regions – the case of Baden-Württemberg. *38th Congress of the European Regional Science Association, 28 August – 1 September 1998 in Vienna.*

Statistics Finland (2016). Tuotteiden ja prosessien innovointi piristymässä, digitalisaatiosta vauhtia liiketoimintaan? *Tiede, teknologia ja tietoyhteiskunta 2016.*

Sydney Business Chamber (SBC) and NSW Business Chamber (2015). Industry - research collaboration. Discussion paper. Available at: https://www.nswbusinesschamber.com.au/NSWBCWebsite/media/Policy/Thinking%20Business%20Reports/Industry-Research-Collaboration.pdf.

Tamura, S., Sheehan, J. Martinez, C. and Kergroach, S. (2005). Promoting Innovation in Services. Working Party on Innovation and Technology Policy. *OECD Publications.*

Tekes (2010). Cocomms. *Internal document on communication results.*

Tekes (2011). The Final Report of Liito Programme. *Internal Document.*

Tiensuu, V., Saha, M., Luotama, H., Peltonen, S. and Lammi, M. (2014). Service innovation in Finland. A national survey about service business and innovation in Finland 2011. *Muova Design Research 2/2014.*

The Research Council of Norway (2015). Midway Evaluation of seven Centres for Research-based Innovation (SFI-II). *Evaluation, Division for Innovation*.

The Research Council of Norway (2016). Programme for User-driven Research-based Innovation (BIA). Available at: http://www.forskningsradet.no/en/Funding/BIA/1196373095541?visAktive=true.

Trade and Industry Ministry of Finland (2013). Luovien alojen yrittäjyyden kehittämisstrategia (2015). *Publications 10/2007.* Available at: http://www.tem.fi/files/19795/Luovat_alat.

UK Government (2014). Innovation, Research and Growth. *Innovation Report 2014. UK Government, Department for Business Innovation and Skills.*

United Nations (2011). Promoting Innovation in the Services Sector. Review of Experiences and Policies. *United Nations Publications.*

Valtonen, A. (2007). Redefining industrial design. Changes in the Design Practice in Finland. *Dissertation, Publication series of University of Art and Design Helsinki A 74.*

Vepsäläinen, A. (2015). TAPAUS: MUOTOILIJA 2025. Hypoteesi muotoilijan ammatillisesta tulevaisuudesta. *Thesis, Lahti University of Applied Sciences.*

Virtanen, P. and Stenvall J. (2014). The evolution of public services from co-production to co-creation and beyond. New Public Management's unfinished trajectory? *International Journal of Leadership in Public Services*, 10(2), pp. 91–105.

Vähä, P., Kettunen, J., Ryynänen, T., Halonen, M., Myllyoja, J., Antikainen, M. and Kaikkonen, J. (2009). Palvelut muokkaavat kaikkia toimialoja. Palveluliiketoiminnan toimialakohtaiset tiekartat. *VTT Research Notes 2508*.

Whicher A., Cawood, G. and Walters, A. (2012). Design Policy Monitor 2012. Reviewing innovation and design policies across Europe. Available at: http://www.seeplatform.eu/docs/SEE%20Design%20Policy%20Monitor%202012.pdf.

Whicher, A., Swiatek, P. and Cawood, G. (2015). Design Policy Monitor 2015. Reviewing Innovation and Design Policies Across Europe. Available at: http://www.seeplatform.eu/docs/SEE%20DPM%202015%20Jan.pdf.

Annex 1. Illustration of timeline of Design Concepts

Decade	Value	Role of Design	Key Events
2010's	Change	Design as a Transformative Process	Design Driven City World Design Capital 2012 Design Associations
2000's	Innovativeness and Competitiveness	Design as Innovation Driver	Aalto University Muoto 20015!
1990's	Brand Building	Design for Creating Experiences for Customers	National Design Policy IDBM & PDP Programs
1980's	Design Management	Design as Coordinator	ICSID Conference in Helsinki CAD Software
1970's	The Rise of Ergonomics	Design for User Understanding	First Design Agencies In house Design Teams
1960's	Involving Industry	Design as Part of a Team Together with Mechanics and Marketing	Start of Design Education
1950's	Promoting the Nation	Designer as a Creator	Milan Biennale 1950

Figure: Developing Definition of Design in Finland (Developed from Valtonen 2007)
Source: Antti Pitkänen Seos Design 2016

Tekes' Reports in English

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Keinänen, Leevi Parsama, Antti Pitkänen and Mikko Wennberg. Evaluation Report. 69 p.

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Finland and Sweden. Kimmo Halme, Henri Lahtinen, Martin Fröberg, Anna Zingmark,
Christian Haeger, Tarmo Lemola, Jussi Autere and Ilkka Tuomi. Evaluation Report. 237 p.

2/2015   Innovation in Natural Resources – Evaluation of Tekes' Programmes on Natural
Resources. Päivi Luoma, Scott Harder, Mari Hjelt, Lauri Larvus, Tiina Pursula, Tuomas
Raivio and Juha Vanhanen. Evaluation Report.

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Evaluation Report. 67 p.

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89 p.

5/2014   Evaluation of Finland Distinguished Professor (FiDiPro) Programme. Mikko
Wennberg, Olli Oosi and Mia Toivanen. Evaluation Report. 42 p.

3/2014   Evaluation of the NeoBio and SymBio programmes. Peter Stern, Anders Håkansson,
Marja Tähtinen, Jelena Angelis, Tiina Saksman Harb and Tomas Åström.
Evaluation Report. 78 p.

7/2013   Tekes Functional Materials Programme 2007–2013. Sustainable material solutions
– From Finnish research to global business. Markku Lämsä, Markku Heino and
Vilja Vara (eds.). Final Report. 166 p.

2/2013   Path to creating business from research – Evaluation of TULI Programmes.
Joakim Ketonen, Laura Juvonen, Nils Gabrielsson, Matti Kuusisto and Pekka Koponen.
Evaluation Report. 71 p.

7/2012   BioRefine – New Biomass Products Programme. Tuula Mäkinen, Eija Alakangas
and Niina Holviala (eds.). Final Report. 100 p.

6/2012   Navigating New Routes to a Better Boat Industry – Executive Summary of the
Research Programme 2007–2011 in Finland. Markku Hentinen, Sirpa Posti and
Kari Wilén (ed.) Final Report. 69 p.

2/2012   Software, mobile solutions and games industry – Evaluation of Tekes software
related programmes. Tuomas Raivio, Johan Lunabba, Erkka Ryynänen, Juhani Timonen,
Markku Antikainen and Santeri Lanér. Evaluation Report. 83 p.

6/2011   Co-operation to Create Converging and Future Networks – Evaluation of Five
Telecommunications Programmes. Annu Kotiranta, Olli Oosi, Mia Toivanen,
Jaakko Valkonen and Mikko Wennberg. Evaluation Report. 69 p.

4/2011   GIGA – Converging Networks programme 2005–2010. Final Report. 217 p.

1/2011   FinNano Technology Programme. Final Report.

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