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Knowledge-intensive service activities in health care innovation

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ISBN 951-38-6505-3 (soft back ed.)

ISSN 1235-0605 (soft back ed.)

ISBN 951-38-6506-1 (URL: <http://www.vtt.fi/inf/pdf/>)

ISSN 1455-0865 (URL: <http://www.vtt.fi/inf/pdf/>)

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JULKAISIJA – UTGIVARE – PUBLISHER

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Technical editing Marja Kettunen

Otamedia Oy, Espoo 2004

Kivisaari, Sirkku, Saranummi, Niilo & Väyrynen, Erja. Knowledge-intensive service activities in health care innovation. Case Pirkanmaa. Espoo 2004. VTT Tiedotteita – Research Notes 2267. 104 p. + app. 4 p.

Keywords knowledge-intensive service activities, systemic innovations, health care

Abstract

As part of the OECD 'KISA' project this report focuses on identifying carriers of and barriers to systemic innovation in health care. It specifically explores the role of knowledge-intensive service activities (KISA) in enhancing innovation. In this study, systemic innovation refers to changes in the integrated system of health care practices, services, technologies, and organisation that together form a new mode of operation.

The report is based on a case study in Pirkanmaa Hospital District, and analyses development of systemic innovations. The historical analysis covers two levels, namely corporate and business levels. The data incorporate interviews and documentary material.

The findings relate to the carriers of and barriers to systemic innovation in Finnish specialised health care and the role of KISA in innovation. The case study suggested that some regional environment and the management style related aspects contributed to innovation. From the point of view of regional environment, important carriers were the regional political ethos favouring collaboration for innovation, the substantial regional networks of competence, and well balanced relationship between the university level hospital and hospital district. As to managerial practices, the carriers incorporated the ability to create strategic conversation, corporate management's open-mindedness and strong support for experiments, as well as recruitment of tenacious and skilful champions for systemic innovation.

On national level, the Government's recent recommendations for reform have added momentum to change. However, there are still many barriers to cross. Some of these relate to the lack of objective quantitative indicators measuring performance, efficiency, and effectiveness. They are critical for justifying the need for change and for quantifying the economic gains of reorganisation. The study also indicated challenges that relate to outsourcing, like finding the most suitable organisational form for the new units.

In terms of KISA, the findings indicated that in-house competences in knowledge-intensive service activities have been consistently built and used. They have been supported by extensive use of external management training and education services. External KISA were typically related to early development stages of the systemic innovation. Expert services have been acquired in order to gain preliminary information and well-prepared recommendations and to legitimate systemic innovation. The findings are discussed from the perspectives of organisational learning and diffusion of innovation.

Executive Summary

OECD, KISA and systemic innovation

This case study is part of a larger OECD-level activity focusing on the role of *knowledge-intensive service activities* (KISA) in innovation systems. The whole study covers several sectors, one of which is health care.

KISA can briefly be defined as *expert services*. The origins of these businesses can be traced to the times when corporations understood that they must focus on their core competencies and that non-core activities could be supported by external service providers instead of building and maintaining these services in-house. Typical KISA comprise consulting, training and education, financial, legal, and technology-based services. They can be produced in-house and by external actors. The external actors can be business companies or public organisations. The term knowledge-intensive business services (KIBS) refers to the former. Research and technology organisations (RTO) are examples of the latter.

The other concept defining the case study, in addition to KISA, is *systemic innovation*. The reason for this focus is that today, it is not technology alone that redefines health care systems. In fact, the systems face a number of change pressures. On the one hand, the rapid ageing, the changing life styles and expectations increase the demand for health care services. Simultaneously, there is political debate going on concerning the limits on public funding of health care. On the other hand, the continuous progress in medicine, life sciences, and technology enables new diagnostic and therapeutic cares for illnesses that could not be treated before. As a result, the scope of health care is expanding continuously and the demand for services keeps growing. The challenge is how to meet demand while containing costs, in other words, how to provide more high quality services without increasing costs. The “only way out” of this dilemma is systemic innovation; changes are required in the integrated system of technologies and health care practices. All elements making up the health system need to be critically analysed, especially the production of health services, i.e. processes, resources, skills, technology, organisation, and management.

In a wide sense, innovation can be interpreted to involve the successful exploitation of new ideas in any setting. In this report, the term systemic innovation refers to simultaneous changes in the integrated system of health care practices, services, technologies, and organisation that together form a new mode of operation. The term innovation is justified by the novelty of the solutions in the Finnish context and the implementation of the solutions in Pirkanmaa region. Because the reforms are fairly

recent, it is too early to assess the success of the implementation. Time will tell whether these innovations will find their way into other organisations.

Case study: the Pirkanmaa Hospital District

The *Pirkanmaa Hospital District* (PHD) is owned by 34 municipalities. Its mission is to provide specialised health care services to the 450 000 people living in these municipalities. The municipalities pay the costs. The PHD's services are provided by a university hospital and three regional hospitals and by a workforce of 5 600 employees. The health centres of the municipalities provide primary care services. Access to the PHD's services is through referrals and emergencies. The geography of the district is such that most of the population is living in the city of Tampere and the five adjoining municipalities (Kangasala, Lempäälä, Nokia, Pirkkala, and Ylöjärvi). The longest distance to the university hospital is around 100 km. As the PHD incorporates a university hospital, it has special responsibilities (based on legislation) towards four other hospital districts.

Table ESI. Systemic innovations studied.

Systemic innovation, Corporate level	Description	
<i>Management methods and tools</i>	<p><i>Internal</i> Quality management system, extensive management training and education programs, BSC, and datawarehousing for MIS</p> <p><i>Municipal relations</i> Purchaser - provider dialogue to place annual orders and to monitor their delivery</p>	
Systemic innovation, Business unit level	Description	Organisational form
<i>Coxa Hospital</i>	Outsourcing of orthopaedic joint replacement surgery (a clinical core activity of the PHD)	Limited company Owned by the PHD, municipalities and private parties
<i>Laboratory Centre</i>	Regional integration of laboratory services in primary and specialised care	Public utility Owned by the PHD
<i>Mänttä Health Region</i>	Regionally integrated unit of specialised and primary health care	Profit unit of the PHD
<i>Imaging Centre</i>	Regional integration of imaging services in primary and specialised care	Public utility Owned by the PHD

The reason for focusing the study on the PHD was that it is considered a forerunner in Finnish health care in terms of finding new innovative ways to meet its responsibilities towards the municipalities and also towards the other hospital districts. Of the several systemic innovations within the PHD we focused on four: the Laboratory Centre, the Coxa Hospital, the Mänttä Health District and the Imaging Centre. In addition to these *business level* innovations, we identified a chain of management system innovations on *corporate level* that have set the scene for the business level developments (see Table ES1).

The case study was carried out through 21 interviews of management, KISA actors and representatives of the ministry of social Affairs and Health, analysis of available documentary material, and in the end through a joint meeting with the interviewees to discuss the results.

Findings

The study indicated that in the PHD, setting up new business units has been mainly based on internal KISA. Two explanations were given for this choice. First, in a large organisation such as the PHD, with 5 600 employees, there is latent interest, competence and skill that can be recruited and trained. Second, change management is a process that cannot be outsourced. The responsibility for its success rests with the organisation. Outside experts can only facilitate the process, but cannot lead or champion it. However, external consultancy services have been used to some extent in the early preparatory steps for two reasons. Firstly, the PHD did not have the necessary competence to assess the overall situation and formulate alternative courses of action. Secondly, an external expert organisation provided the required neutrality in the early critical stages of change management. The neutrality aspect is especially important in the public sector, where decisions for change must be based on consensus between all parties concerned (in most cases the municipalities owning the PHD). At all times, external KISA have been used extensively for training and education at all levels and network-KISA have played a central role in accessing new ideas.

The study sought to explain why the PHD was able to act as a pioneer in systemic innovation within Finnish specialised health care. Several threads of activities have come together and laid the foundation for successful change processes in the PHD. The first of these deals with *long-term, consistent commitment at corporate level to develop internal and external management capabilities*. Since the early 80s, external training and education services have been used to build management skills and to learn from the general business management principles. E.g. today, the PHD requires that all business unit managers have an MBA or be willing to get one (financed by the PHD). Long-term investments have been made in quality management. Today, it cuts across the whole organisation and is part of its day-to-day operation. Parallel to these, BSC and a datawarehouse system have been implemented for internal management and strategic

planning. For the dialogue with the municipalities and their healthcare centres, a purchaser-provider mechanism has been developed. All these have been essential tools in deriving the necessary 'hard facts' on the expected benefits in terms of finances and in winning stakeholder commitment to starting the actual change processes.

Secondly, there are certain *management practices* that have contributed to systemic innovation. Among these there were skilful leadership and the ability to recruit tenacious champions to lead the reform processes. Additionally, the PHD invests considerably in R&D because it cannot afford not to. Change is part of management strategy. Strategies are formulated in dialogue with the hierarchies of the PHD and its constituents and therefore the strategies are implementable. The PHD has been able to bridge the knowing-doing gap effectively (Pfeffer & Sutton 1999).

A third contributing factor is the overall *regional environment* in Pirkanmaa, which is favourable to new, innovative ideas. Tampere and Pirkanmaa are known for the “bold ideas” that they have been able to implement. Examples include both universities, which were started some 40 years ago (Tampere University and Tampere University of Technology), the medical faculty about 30 years ago, and the two technology parks (Hermia and FinnMedi) some 20 years ago. There is a history of actors in Pirkanmaa working together to create new activities.

As much as these competences and circumstances have contributed to the ability to carry out reforms, managing change has not been easy. This is because change often influences established power balances. For instance, quality management can appear as a threat as it requires changes in how health care professionals and management relate to patients and co-workers. By requiring measurement and by rendering professionals' performance more visible and controllable, quality management systems tend to reduce the power and autonomy of professionals (Striem et al. 2003). The core clinical competences have grown over time as an accumulation of activities and decisions that focus on one kind of knowledge at the expense of others. This is why Leonard (1998) contends that an organisation's core capabilities easily become its core rigidities. She writes that “once a system is set up to deliver a certain capability, the system acquires a momentum of its own and becomes difficult to dismantle even if it is now outmoded”. Several mechanisms interactively tend to maintain the existing core capabilities. They relate to economics, power politics, and behaviour. In the PHD case it was interesting to note that e.g. in quality improvement projects special attention was paid to “weeding out” existing practices before replacing them with those developed in the project.

Discussion

From the KISA viewpoint, the main issues arising from the findings above are related to (1) carriers and barriers for change and (2) to the relation of internal and external KISA to organisational learning and knowledge transfer.

The current national policy environment puts health reform high on the agenda. The Government has accepted a number of recommendations that are currently being implemented. Special funding is available for certain change activities. However, the responsibility for action rests with the municipalities and the health care organisations owned and operated by them. The Government steers the change processes by information, legislation and special funding programmes. Municipalities, on the other hand, have difficulties in providing adequate health services within their annual budgets. The Government's recommendations tend to promote change. And indeed, today there are signs of diffusion. E.g. the Laboratory and Imaging Centre ideas are part of the national health reform strategy and several hospital districts either have implemented them or are in the process of doing it. However, there are still barriers to cross.

The most important barrier is probably the fact that each organisation tends to consider its operations so unique that successful solutions developed elsewhere are “not implementable here”. In a sense, this attitude was also present in the PHD case: new ideas were adopted but implementation was always local using internal KISA. If each organisation develops solutions from scratch by itself and builds its own competence and skill base, there is no knowledge transfer. This would result in “reinventing the wheel” several times over without making use of the lessons of previous implementations. It is clear that change processes cannot be led or championed by outside experts, but this should not preclude the possibility of using outside knowledge to facilitate them.

Another barrier relates to metrics. Health care lacks clear, objective, quantitative indicators that could be used to benchmark how the resources are allocated, how effectively they are used, and what outcomes are produced. Indicators are being developed, but a lot of progress is still needed. There is data on outcomes based on disease classifications, usage of in-patient and out-patient facilities, number of procedures performed, etc. at profit-centre level. However, there is very little data on how resources are used in different patient / illness segments and what results are produced. The methods used in service and manufacturing industries to determine where resources are needed for optimal performance are only slowly finding their way to health care.

Management needs to present objective, quantitative data to justify the need for change to elected officials and municipalities. This is critically important because without being authorized by decision making bodies, management cannot start implementing change. In the PHD case, the corporate management has been able to acquire the financial data to back up its change arguments. These were provided by in-house experts (in the case of the Laboratory and Imaging Centres and Coxa) and by outside experts (in the case of Mänttä and initially Coxa). Objective indicators are also needed for quantifying economic gains of reorganisation.

The third barrier relates to decision making and resolution of conflict situations. The PHD study revealed that all decisions have to be based on consensus. At the risk of oversimplification, the idea of majority decisions seems rather alien to the public sector. Striving for consensus means that small minorities can block initiatives. It also means that strong quantitative facts are needed to convince all stakeholders. Combining this with the lack of objective performance indicators leads to deadlock. There is nearly unanimous agreement that changes are necessary, but no agreement on what the changes should be.

It is interesting to contrast this decision making climate with that of clinical medicine. The innovations in medical procedures, pharmaceuticals and health care technologies tend to diffuse rather quickly into clinical practice. Decision making is based on opinion leaders publishing in scientific journals and conferences. New ideas generally go through a rigorous process to determine their efficacy and effectiveness. Medicine can thus be characterised as open to new ideas and innovations. The difficulties arise once the established power balances are challenged by new ideas. However, even in these areas after some “turf wars” new roles and responsibilities are rather quickly negotiated through scientific debate. In the change processes of medicine the actors in most cases are medical professionals. Accepting a new medical procedure, drug or medical device can be seen as augmenting the skills and capabilities of the professionals. These innovations do not challenge their existence or roles. This is something that the professionals can decide between themselves, i.e. inside their profession. Health reform with its various initiatives for change, on the other hand, has the potential to taking this decision making out of the hands of the clinicians.

Another potential barrier relates to how outsourcing is done, i.e. what organisational form is selected for the new business unit. The choice between a limited company and public utility has important implications in terms of competition and other aspects. For instance, claims have been presented in a public debate over the claim that the Laboratory Centre, as a public utility, operates in a too sheltered environment. It can always count on its owner, in this case the PHD, to act as its major customer. Privately owned laboratories can therefore not compete with it on level ground. Similarly, the limited company form has potential problems. For instance, the business idea of the Coxa Hospital is also to get contracts from other hospital districts and municipalities outside the PHD. The question is whether there are strong enough incentives for them to purchase hip replacements surgeries from outside. Or is it easier to continue carrying out surgeries by themselves. Even if Coxa can make a case for better quality and hip replacement surgeries with less cost, the potential purchaser of Coxa services faces a difficult decision. In most cases the purchaser has in-house services for hip replacement surgery. The decision to buy or not to buy has implications for the in-house capabilities. One has to remember that health care is today a “zero sum game”. If hip replacements are bought from outside then that money goes outside and savings of the same size have

to be found internally. Again, the lack of objective indicators means that it is not easy to argue for such changes.

The same competition also exists internally when new business units are created through outsourcing and reorganising of responsibilities. The newly formed unit must continuously meet the needs of the customers and maintain their trust in its capability to serve them well. Otherwise, the customers may be tempted to produce the services by themselves. Professional organisations, especially, have a tendency to “regrow” functions that they initially outsourced. If the incentives are not clear enough it may seem more economical to carry out certain services inside a profit centre than purchasing them from outside. This results in a double organisation and in a deterioration in overall efficiency. This is a known problem related to managing corporations through profit centres. However, the problem is aggravated in public organisations because their cost awareness is not so good and costing of own work is not based on all additional and overhead costs. The Laboratory Centre of the PHD serves as an example. Through its centralised analysis facility it can create better economies of scale than the decentralised model. But at the same time, it is removed from points of care (POC) and cannot provide laboratory services as quickly as modern POC-instruments can. A balance has to be struck and continuously maintained between the needs and the possibilities offered by technology and centralisation.

Internal and external KISA are connected to organisational learning and knowledge transfer. The encouragement and development of internal KISA is expected to lead to organisational learning. Similarly, the encouragement and development of external KISA should lead to knowledge transfer and diffusion of innovations. The question is, is there an optimal mix of internal and external expert services?

There are two issues that should be considered in this context. First, systemic innovation is a process that takes place inside an organisation and has to be led by internal resources. Using in-house resources for problem solving and implementation leads to organisational learning and the organisation will be better positioned against competition and changes in the market place.

Secondly, the requirement for internal leadership does not, however, exclude the use of external expert services to facilitate the change process. What services the organisation decides to use depends, of course, on what is available and what services it needs to complement its internal capabilities. The question of what is available creates the “chicken-egg” problem. If there is no demand for expert services there is probably no supply either. And as a corollary, there are no market conditions for such expert services to be created and maintained external to the organisation and therefore the organisation itself is always more capable than outside services. The only way to end this dilemma is for the organisation to make its expertise available to the outside.

The PHD study indicated that currently ideas and experiences are freely exchanged in conferences and other meetings between health care organisations, but that no single organisation has the position, interest or incentive to promote similar change processes in other organisations. Should the 'promoter' be an external neutral actor or the innovator? The innovator would probably benefit from being involved in the knowledge transfer process. After all, it has been claimed that mastering something comes from a combination of doing it yourself and teaching others how to do it (Pfeffer & Sutton 1999). According to the interviews, Pirkanmaa receives a lot of invitations to speak on their systemic innovations and many site visits are also made. One possibility for promoting knowledge transfer might be a partnership of the external neutral actor and the original innovator.

In conclusion, service providers naturally need to be fully responsible for managing their systemic innovation processes, finding the needed resources, and developing the required skills. The question is what kind of expert services are needed for supporting these innovation processes and which services should be provided internally and which externally. Currently, there are few competent knowledge-intensive service providers that have insight into the organisational complexity and dynamics of health care. There seems to be a consensus on the need to strengthen the market for high quality expert services for health care sector in order to enhance organisational learning and diffusion of systemic innovation. Developing the market calls for long-term collaboration between customers and external service providers. In the long run, both health care organisations and KISA actors will benefit from collaboration. The qualifications of KISA actors will increase and the emerging market for high-quality service will benefit health care organisations. Building long term innovative partnerships starts from preparing a clear business agenda, the commitment of both partners to change and investment by both parties. Among the expert services there could be, for instance development of indicators to benchmark performance, to justify reforms, and to evaluate progress and results and methods and tools for health care process modelling.

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Abbreviations

BSC	Balanced Score Card
CEO	Chief executive officer
EPR	Electronic patient record
FIOH	Finnish Institute of Occupational Health
HUS	Hospital District of Helsinki and Uusimaa
HUT	Helsinki University of Technology
IT	Information technology
KELA	Social Insurance Institution of Finland
KIBS	Knowledge-intensive business services
KISA	Knowledge-intensive service activities
MBA	Master of Business Administration
MIS	Management information system
MQ	Master of Quality programme
OECD	Organisation for Economic Co-operation and Development
PACS	Picture archiving and communication system
PHD	Pirkanmaa Hospital District
PIRKE	Project for development of regional health care information network in Pirkanmaa
POC	Point of care
ProACT	Research programme for Advanced Technology Policy funded by Tekes and the Ministry of Trade and Industry
QM	Quality management
RHCN	Regional health care information system
RIS	Radiology information system
RTO	Research and technology organisation
STAKES	National Research and Development Centre for Welfare and Health
TAUH	Tampere University Hospital
TEKES	National Technology Agency
TIO	Tampere Information Technology Centre (a public utility of Tampere City)
TU	Tampere University
TYT	Institute for Extension Studies in Tampere University
VTT	Technical Research Centre of Finland
WHO	World Health Organisation

1. Introduction

1.1 Background of the study

This report is part of the OECD 'KISA' project. The purpose of the OECD KISA project is to increase understanding of the nature of knowledge-intensive service activities (KISA) and their role in innovation. Such understanding can create a basis for innovation policy development in the area of knowledge-intensive services. The aim of the OECD project is to identify opportunities for policy interventions and measures which can promote the development and more effective utilisation of KISA. The project is being carried out in selected industry clusters of which health care is one. The results of the international KISA study will be reported by the OECD in autumn 2005.

The Finnish part of the OECD KISA Health Care research project comprises a macro-level analysis of the Finnish health system and two case studies. The cases explore the role of KISA in developing the capability of the health care system to innovate. One of the case studies deals with innovative partnerships in treating major health problems. This was carried out in the Pirkanmaa Hospital District (PHD) by VTT. The other case study deals with information flow and co-operation to promote living at home in old age. Its context is the City of Kuopio and the study was carried out by Stakes. A report focusing on policy relevant conclusions of both case studies will be published by Tekes at the end of 2004 (in Finnish).

This is a report of the Pirkanmaa case study that was conducted by VTT Information Technology and VTT Technology Studies. The case study primarily serves the OECD KISA project. However, gathering and analysing Pirkanmaa data has also served the needs of another on-going research project of VTT Technology Studies & VTT Information Technology. This so-called 'Juureva' project focuses on the challenges of building an innovative partnership in developing systemic innovation. Further analysis of this data will be continued within Juureva project. The project is funded by Tekes and it is part of ProACT programme.

1.2 Structure of the case study report

The report starts by explaining the research questions and the methodology (chapters 2 and 3) and the general context, the Finnish health system (chapter 4). It then goes on by describing the case, Pirkanmaa Hospital District, on two levels that we call the corporate and the business levels. Chapter 6 describes the corporate level developments and Chapters 7-10 delineate the business unit level developments (see Table 1).

Table 1. Structure of the PHD case in the report.

<i>Systemic innovation at corporate level</i>	<i>Chapter 6</i>
<i>Systemic innovation at business level</i>	
* Laboratory Centre	Chapter 7
* Coxa Hospital	Chapter 8
* Mänttä Health District	Chapter 9
* Imaging Centre	Chapter 10

On both levels, the description covers a number of aspects, such as the early history of innovations, the baseline when restructuring started, reasons for starting these activities, the actors and stakeholders, proceeding of the process and results. The question of whether the phenomena observed in this case study really merit being called innovations is also discussed. After that, chapter 11 presents the findings regarding the role of KISA in the PHD systemic innovation.

The discussion part of the report (chapter 12) explores the carriers and barriers of systemic innovation and the impact of KISA in the innovation case. It raises the question of the "optimal" or "right" mix of internal and external KISA in the health care sector. The mix is relevant in terms of learning and knowledge transfer (making use of solutions that have been proven to work).

The policy-relevant conclusions of this study will be deepened in the subsequent report that will be published (in Finnish) by Tekes in the autumn 2004. That report will discuss the policy issues that have been encountered, including both existing policies and missing policies. It makes suggestions on instruments that might be used to remove barriers to innovation and/or further activate carriers of innovation.

2. Objectives and key concepts

2.1 Research questions

The case study explores the role of *knowledge-intensive service activities* (KISA) in the restructuring of health care services in a regional setting and covers the continuum from primary to tertiary care. In other words, it examines whether KISA has had an influence on the restructuring processes and more generally what role KISA plays in the systemic innovation capability of health care.

On the general level, the aim of this case study is to *identify carriers of and barriers to systemic innovation in health care especially from the point of view of KISA*. The use of internal and external KISA is discussed from the point of organisational learning and diffusion of innovation.

Besides the framework provided by the national level objectives, the researchers sought to somehow *contribute to future systemic innovation in Pirkanmaa*. It has been stated that organisational change consists partly of a series of emerging constructions of reality, including revisions of the past, to correspond to the requisites of new players and new demands (Kanter 1983). From this perspective, change also involves designing reports about the past to continue to construct and reconstruct participants' understanding of events so that the next phase of activity is possible.

This report provides one reconstruction of the past changes in the PHD. The report offers a new perspective, that of the role of KISA in systemic innovation that may be useful in developing future innovation in the region. The aim is that this reconstruction facilitates continued systemic innovation in the PHD and thereby in Finnish health care more generally.

The report identifies the KISA that have been used in the PHD, finds reasons and rationalities for their use (and non-use) and describes the interaction between KISA and the core activity of health care (health service delivery), and provides insight into how KISA is related to particular phases of innovation. Accordingly, KISA is examined from four aspects:

- 1) The kinds of KISA used
- 2) Why particular kinds of KISA were used
- 3) How were they used
- 4) When particular kinds of KISA were used

2.2 Key concepts

Innovation

In the empirical study the terms '*innovation*' and '*innovativeness*' refer to the novelty of the solutions studied in the Finnish health care context. We are not making presumptions or claims about the success of the solutions and processes studied. The reform processes under study are fairly recent and there is still no evidence to make well-grounded conclusions about their success. The success aspect of the systemic innovations is, however, considered briefly at the end of Chapters 6–10.

Systemic innovation

This case study focuses particularly on *systemic innovation*. The concept of systemic innovation has been used in different disciplines and different discussions (e.g. Elzen et al. 2004; Smith 2000) in prior literature.

In this study, systemic innovation refers to *changes in the integrated system of health care practices, services, technologies and organisation that together form a new mode of operation*. Figure 1 provides an illustration of the concept.

In terms of technology, systemic innovations are not necessarily radically new. The innovativeness may be based on a new way of combining different kinds of incremental innovation. However, radical technological innovation is related to systemic innovation in such a way that it often brings along systemic innovation because the environment may not be prepared to adopt a radically new technology: adoption may call for amendments to regulations, changes in industry structure, changes in user practices, or new modes of thinking.

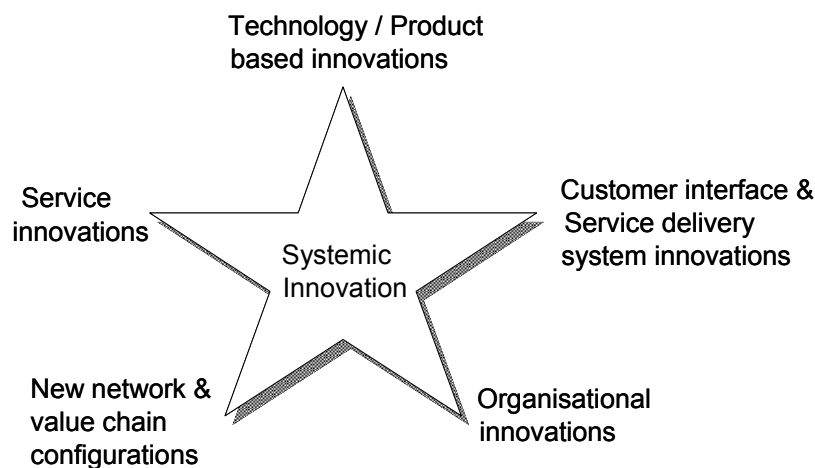


Figure 1. Systemic innovation (Kuusisto 2004).

In the PHD context, the concept refers to the *simultaneous*

- redefinition of the boundaries of service provider organisations
- provision of new kinds of services and
- application of new technologies.

Knowledge-intensive service activities

The general definition of KISA (knowledge-intensive service activities) can be phrased as follows when applied to the health care sector: KISA are defined as expert service activities provided either internally or externally to a health care organisation. External KISA can be provided by private enterprises and public sector organisations, such as universities and research organisations. Typical examples include R&D services, management consulting, IT services, human resource management services, legal services, accounting and financing services, and marketing services. What KISA actually refers to in health care was a question to be answered in more depth on the basis of the empirical study. For a somewhat more elaborate interpretation of the concept see Chapter 11.1.

3. Design of the study and methodology

3.1 Case study approach

This case study deals with systemic innovation in the Pirkanmaa Hospital District (PHD). In this report, systemic innovation refers to *simultaneous redefining of boundaries of service provider organisations, development of new kinds of services and application of new technology*.

The case report provides a historical description of the systemic innovation process in the PHD on two levels. We call one the corporate level and the other the business level of analysis (Figure 2). We are aware that this kind of terminology is not typically used in public sector. However, using business analogy we only aim to make the distinction between different managerial levels.

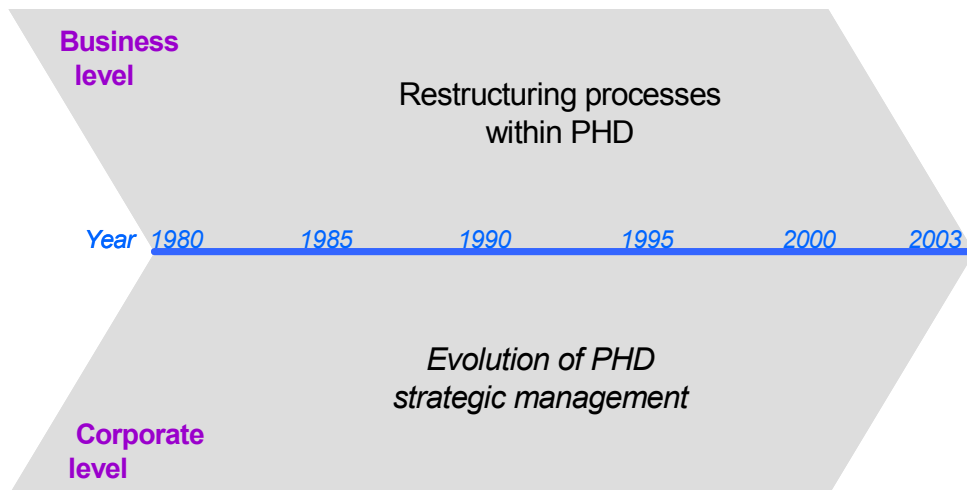


Figure 2. Research setting: two levels of analysis of the Pirkanmaa Hospital District.

On the corporate level, we explore the structural and managerial reform of the whole hospital district, which has provided tools and shelter for the new service developments. On the business level, we study the four cases of structural reform of existing services in the PHD. On both levels, we focus on the role of KISA in the development of these innovations.

3.2 Methods and data collection

The study is based on an analysis of documentary material and 21 interviews. The documentary material covers articles, and PHD documents such as strategic guidelines, annual reports, and statistics.

The interviews were conducted with representatives of the PHD corporate management, managing directors of the newly formed “business” units, internal and external KISA actors and representatives of the Ministry of Social Affairs and Health (see list of interviewed persons in Appendix A). All of them were conducted during spring 2004, except for one which was conducted in spring 2003. The interviews were unstructured and lasted from 1,5 to 2 hours.

The interviewees were asked to tell their own stories of the events that led to structural reform processes and how the reform has proceeded up to present time. The storytelling was supplemented with questions of clarification as the stories unfolded. Every interviewee told the story from his/her perspective.

The term KISA was not used in the interviews because on the whole the interviewed people were not familiar with it. Instead, we used the term "expert services". The KISA perspective to innovative activities seemed to be quite new to the interviewees. They were given the explanation that KISA referred basically to the following four kinds of expert services:

- in-house expert service activities supporting innovativeness in the clinical core activities,
- external expert services acquired from private companies or consultants,
- external expert services acquired from public research and technology organisations and
- network activities supporting innovativeness in the clinical core activities.

The historical description of the events provided by this report is built on the perspectives given by the 21 complementary 'stories' and the documentary material. Some issues concerning the making of historical accounts need to be considered here.

Firstly, the interviewees did not always share the same idea about the beginning time of the innovation process. This is natural, because setting the beginning is typically fairly arbitrary. When reconstructing the process we, as researchers, have set beginnings fairly far back in history in order to indicate how the ground for innovation has been prepared, little by little, by seemingly unrelated events.

Secondly, some things tend to bias historical reconstruction of innovation processes (e.g. Kanter 1983).

- In retrospect, it may be difficult to tell whether something was accomplished by one person or whether credit should be given to many people collectively. This may be, for instance, because gaining overall commitment to something in an organisation calls for giving credit to many actors to make them feel they have initiated the change process or that they own the change process.

- Especially in successful cases, conflicts that were related to decision making tend to be forgotten and the idea of consensus starts to predominate. The choice that was once made becomes the 'obvious' choice.
- Accidents, uncertainties and confusion tend to vanish into clear-sighted strategies. This is often referred to by the term "reconstructed logic".
- The fragility of changes tends to vanish into images of solidity and full actuality. There are often contradictory organisational tendencies, but these may be ignored in favour of an innovation.

Being aware of the above-mentioned challenges related to historical accounts we considered it important to collect many complementary accounts of what happened and how. We interviewed the multiple parties involved. They represented both internal and external expertise as well as different positions and perspectives. In the report we have tried to give a multi-voiced account of the innovation. However, we are aware of the fact that the time span and the resources that were available have limited our data gathering and that some important perspectives could not be included, such as the perspectives of personnel on lower hierarchical levels, of elected municipal officials, and of citizens.

Thirdly, after all the interviews were made, the manuscript of the report was sent to the Pirkanmaa interviewees with a request for comments. These were provided by most of the interviewees. The comments were useful for deepening the interpretations and for increasing the multi-voiced nature of the report. In August 2004, a two-hour meeting was held for the interviewees from Pirkanmaa area to discuss the description of historical innovation processes, the preliminary findings relating to KISA, and the nature of the systemic innovation process. The participants were asked to comment four specific questions in terms of their experience:

- What are the benefits and weaknesses of an in-house KISA and an external KISA in different situations? How do you find the right mix?
- Is there a need to increase external follow-up and assessment studies in relation to major systemic innovations? What are the potential benefits and problems? How can their use be increased?
- Is health care an exceptional field where industrial 'recipes' do not fit? Where do they apply and where must health care specific solutions be developed?
- Should the market for high quality management consulting services for the health care sector be strengthened, and how?

The comments and points of view presented in the meeting were used in finalising this report.

4. Context of the PHD case

This chapter gives a brief overview of the Finnish health system: its structure, actors and roles, performance, and challenges (a more comprehensive description of the Finnish health system is available e.g. at <http://www.who.dk/observatory/Hits/TopPage>). It also summarises the ongoing national level development and incentive activities aimed at supporting innovation in the Finnish health system. The aim is to provide a context that helps in understanding the actions taken in the Pirkanmaa Health District as reported in the later parts of this report.

4.1 Summary of the Finnish health system

In Finland, the health sector is characterised by a strong and diverse government influence and great public interest. Finland uses 7.4 % of its GNP on health care (2002). The Finnish health system is based on a delicate balance between the public and private service delivery and funding (Figure 3).

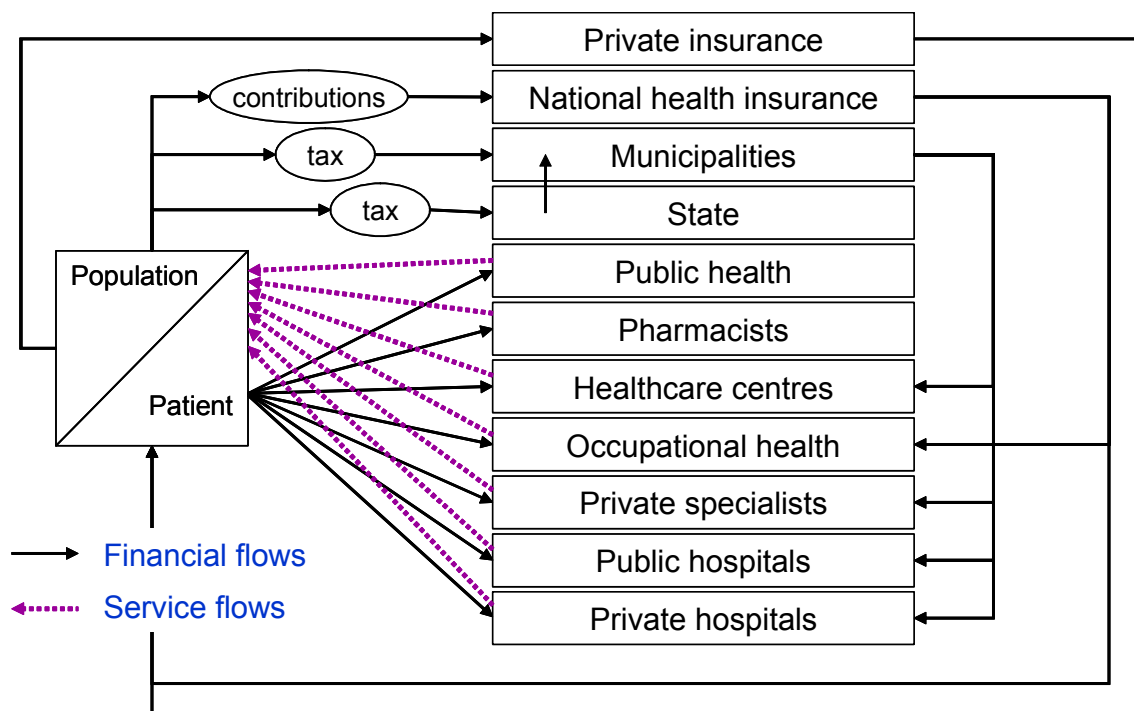


Figure 3. Finnish health system of multiple channels for service delivery and funding.

The main channel is the publicly funded and operated system of primary and specialised care organisations. Their existence is based on two acts passed by the Finnish Parliament (the Primary Health Care Act 66/1972 and the Act on Specialised Medical Care 1062/1989). These acts assign responsibility to the municipalities for arranging access to health and social services for the citizens and patients living in that

municipality and the responsibility to pay for the health services. Hence municipalities in that sense act as health insurance companies. Although the law only requires the municipalities to make health services available, the main approach is either that the municipality produces the services itself or does so in collaboration with other municipalities (with associations of municipalities as service providers). The law would equally allow a municipality to purchase the required services from public or private service providers.

In Finland, citizens have the right of equal access to public health services, independent of their geographical location or financial income. The relatively large geographical area (330 000 square km) of Finland combined with a rather small population (5.2 million), most of which is located in the southern urban areas, means that demand for health care services varies a lot across Finland. Currently, there are roughly 450 municipalities with the obligation to arrange social and health services for their citizens. The populations of these range from 140 to 535 000 (Sotunki being the smallest and Helsinki the largest). Consequently the possibilities of municipalities to act as health insurers vary. In a small municipality, one very sick person can consume a large part of the annual health budget whereas in a large urban city demand can be better estimated and anticipated.

The health services that the municipalities arrange are based on the two acts mentioned above and are currently provided at three levels of specialisation:

- Primary care services are provided by health centres owned and run by the municipalities. In the rural areas associations of municipalities have been formed to provide these services. In 2002 there were 270 health centres. Health centres have a number of responsibilities and employ health professionals (e.g. GP's, district, school and home nurses). Health centres may run nursing homes and local primary care hospitals.
- Hospital districts (20 in Finland + Ahvenanmaa) are responsible for specialised care. These are owned and run by associations of municipalities. All municipalities are required to belong to a hospital district. The population of the smallest hospital district is 70 000 and that of the largest over 1.3 million.
- Tertiary care is the responsibility of the five university hospitals. These are part of their respective hospital districts. These five hospital districts due to their nature also have special responsibilities towards hospital districts in their neighbourhood. Consequently, the country is divided into five responsibility areas.

The public service channel is funded through taxation. Municipalities tax citizens and businesses. Part of that tax is used to pay for the social and health services.

Additionally, part of the state taxes is channelled to municipalities. These are proportioned based on an estimated need of the municipality to carry out its public responsibilities (one of which are the social and health services). The state payments are made as lump sums and the municipalities are free to allocate them according to their needs.

The Social Insurance Institution of Finland (KELA) is based on the Health Insurance Act and its operations are supervised by the Finnish Parliament. Over the years it has been charged with handling a number of national health and social insurance schemes. For example, it reimburses part of the costs incurred in visiting private practitioners, dentists and part of the costs of prescription pharmaceuticals.

Additionally patients are charged small fees for using the public services. There are caps on these fees for patients with major or chronic health problems. Prescription pharmaceuticals from out-patient visits to public health service providers are paid in part by patients and in part by reimbursement by KELA. However, KELA can exempt patients with certain diagnosed chronic conditions from payment.

The private service channel accounts for roughly 10 % of the health services and the so called 3rd sector (not-for-profit organisations owned by foundations or societies) for 5 %. The share of services provided by the private and 3rd sector organisations is increasing, although this trend is still a slow one. Additionally, especially in specialised health care, there are some early signs of interest in outsourcing health services to semiprivate organisations. Partial reimbursement of costs by KELA for visiting private practitioners plays an important role in maintaining a balance of the national health system.

A third insurance mechanism is connected with employment. Private and public organisations are required to arrange occupational health services for their employees. These services are purchased from public and private providers.

The Finnish system has been created over a long period of time and seems to function in a rather stable manner, i.e. the cost of the system is reasonable (as compared with other OECD countries) and the population seems to be reasonably satisfied with the services and with access to them (based on WHO studies). On the other hand, the complex web of multi channel access and funding is known to be sub optimal. Changing it, however, has been shown to be very difficult (see discussion later in this chapter).

4.2 Trends and reform activities

The state has multiple roles. A great deal of basic research and a considerable portion of applied research is publicly funded. The public sector is a significant buyer and user of health services and technology. In addition, the state makes the laws and regulations that set the context for health care. Legislation concerning primary and secondary health care enacted from 1960 to 1990 has dealt with the financing and structuring of the health service system. KELA's responsibilities were extended in the 1980s and 1990s to deal with all basic subsistence issues.

A hierarchical top-down governance model in which the Ministry of Social Affairs and Health was the highest "authority" was used until the 1990s. The dominant approach in governance started to change towards the principles of "New Public Management" in the mid 1990s. A more networked management model has gradually replaced the previous model. Today, the role of the Ministry can be described as "governing at a distance". The change in governance has not been easy but gradually the actors have found their new roles. The health care system has since been going through a structural change focused on better integration of service providers (citizen-centred care, seamless care), preventive and outpatient care, and support for independent living (of the elderly population).

Although the state is the context setter for the Finnish health system, the main actors responsible for the public sector are the municipalities. This is based on a parliamentary act that came into force in 1992 and transferred all responsibility for public services arrangement to the municipalities. The act changed the role of the Ministry of Social Affairs and Health, and today its duties relate to legislation, monitoring the performance of the health system, and to setting up incentive schemes with funding in areas where changes are considered necessary.

A number of agencies work under the Ministry of Social Affairs and Health with special tasks related to the administration of the health system, such as the National Public Health Institute (KTL), National Research and Development Centre for Welfare and Health (Stakes), National Agency for Medicines (Lääkelaitos), Radiation and Nuclear Safety Authority (STUK), National Authority for Medico-legal Affairs (TEO), and Finnish Institute of Occupational Health (TTL).

In 1996, the Ministry of Social Affairs and Health prepared a strategy for exploitation of information technology to support a more general sectoral strategy. The major definitions of the strategy included seamless care, empowerment of citizens, increasing integration with information systems, and strengthening of the wellbeing cluster. Within these strategic guidelines, the ministry financed a number of pilot projects to search for

new ways to use information technology in health care, especially to enable innovation in service delivery.

This development gained support from Finnish technology policy. In 1996, the Science and Technology Policy Council put forward a recommendation for increased research funding to strengthen the national innovation system. Among the government's arrangements was funding for the development of industrial clusters. The Ministries of Trade and Industry and of Social Affairs and Health were responsible for co-ordination of the funding of the wellbeing cluster. The government required improved co-operation between cluster members, networking and deepening of co-operation between and within the public and private sectors.

An act on experiments with seamless service chains in social welfare and health care services and with a social security card was passed by the Parliament to enable piloting of regional integrated services. After a pilot in Satakunta, piloting was extended to an additional three districts and from 2004 onwards all health districts are “onboard” and developing their respective integrated solutions and services.

Parallel to these activities the National Technology Agency (Tekes) has run three technology R&D funding programs in the health care technology domain (Digital media in health care in 1996–99, iWell in 2000-03 and currently FinnWell in 2004–09).

The Wellbeing cluster activities presented above were a major exercise by the two ministries to bring together, on the one hand, the interests of health services and, on the other, industry and technology to create a level playing field for new innovations in technology and health services. The results, when evaluated in 2002, showed that aligning these interests at the ministerial (policy making) and practical (projects) levels was much more demanding than expected. The efforts between the ministries are continued. However, the umbrella term “wellbeing cluster” is not used anymore.

In 2001, the Council of State set up a National Health Project (Ministry of Social Affairs and Health 2002; Sosiaali- ja terveystieteiden ministeriö 2003). The aim of the project was to secure availability, quality and sufficiency of care, based on everyone's needs, regardless of ability to pay or place of residence. The project produced 18 recommendations with identified activities / targets / milestones. The Council of State approved a resolution in 2002 to secure the future of health care by implementing these recommendations. The implementation is currently ongoing at national, district, and local level. The project is managed by the Ministry of Social Affairs and Health. The ministry also provides co-funding in the implementation of certain recommendations. This decision has given guidelines to structural reform processes in health care organisations, for example it has boosted development of regional services. One of the

recommendations deals with information technology as it requires that a nation-wide electronic patient record system be in place by 2007.

4.3 Finnish health care innovation environment

The public sector actors and structure of the Finnish national innovation system is usually presented as in Figure 4. It focuses on the two ministries that have an overall responsibility for science and technology policy, funding and education and R&D. The other ministries are seen as sectoral and play a smaller role. However, the innovation system when seen from the sectoral health care viewpoint, is much more complex (Figure 5). On the one hand, there is the general R&D environment, which comprises the actors described in Figure 4.

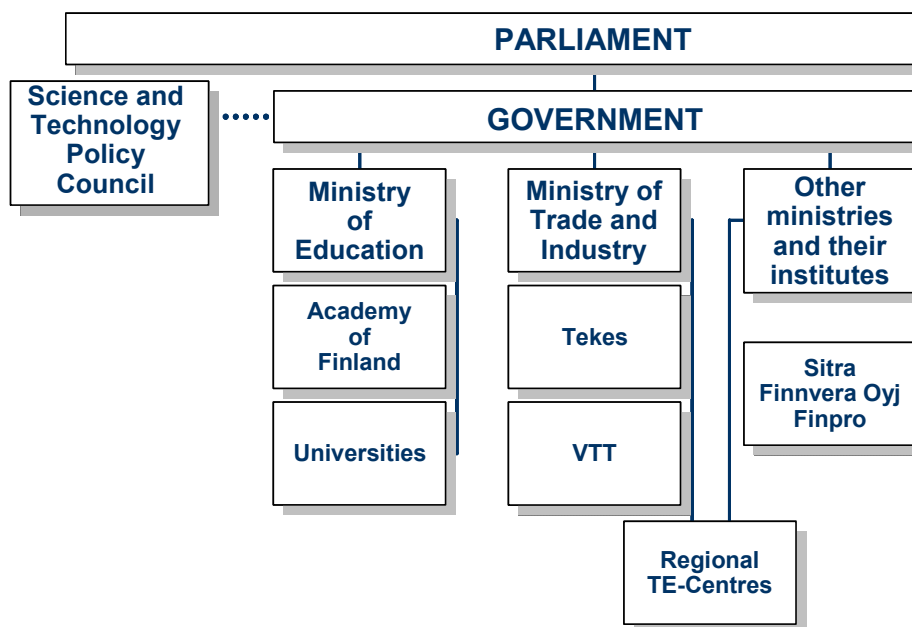


Figure 4. Public sector activities of R&D in Finland.

On the other hand in the health sector, there are the laws, policies, programs and incentives applied to the sector by the Ministry of Social Affairs and Health and its sectoral research institutes, including the social affairs and health departments of the provincial offices. In addition, there are organisations and agencies with interests in the health care sector. Examples of these include KELA, the Association of Finnish Local and Regional Authorities, Finland's Slot Machine Association¹, and the Finnish Medical

¹ Finland's Slot Machine Association (RAY) was established in 1938 to raise funds through gaming operations to support Finnish health and welfare organizations. RAY has an exclusive right in Finland to operate slot machines and casino table games and to run a casino.

Association. Additional complexity arises from the funding that is available through the ESR programs at the provincial level.

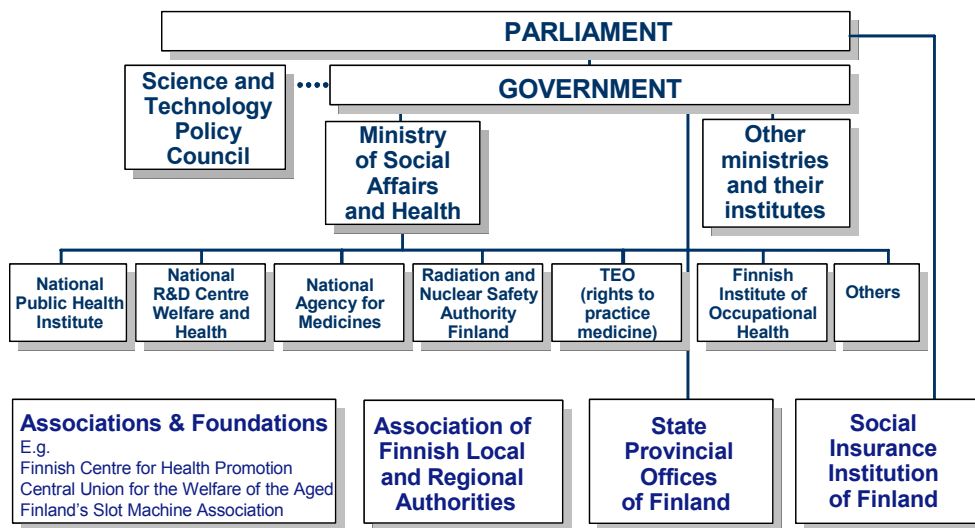


Figure 5. Expanded view of Figure 4 presenting national level health care actors of the Finnish R&D system.

As discussed earlier, the responsibility for organising health services rests with the municipalities. They have set up the health centres and hospital districts to provide public health care. In addition there are the private and semiprivate service providers. Today, the municipalities are the “real” owners of the Finnish health care system. All changes that take place have to go through them. All the other actors (Figure 5) play a supporting role in that sense.

5. PHD case description

This chapter gives an overview of the Pirkanmaa Hospital District. The aim is to provide further detail about the context in which the innovation activities have taken place at the corporate level and in the business units that have been selected for study.

5.1 Pirkanmaa Hospital District - the corporate level

5.1.1 Structure

<i>Name:</i>	Pirkanmaa Hospital District
<i>Organisational form:</i>	Public
<i>Ownership</i>	34 municipalities in the Pirkanmaa region.
<i>Business idea:</i>	<p>The main function is to provide specialised health care services to citizens living in the 34 municipalities of the Pirkanmaa region (a population base of 450 000 citizens).</p> <p>Special responsibilities towards the adjoining four hospital districts are based on the act on specialised health services.</p>
<i>Volume (2002):</i>	<p>70, 000 in-patient visits, 300, 000 outpatient visits.</p> <p>Personnel approximately 5400.</p> <p>Operating revenue € 334 million.</p> <p>Operating expense € 316 million.</p>

As described in the previous chapter, publicly funded specialised care in Finland is organised into hospital districts. In the Pirkanmaa region, a federation of 34 municipalities with approximately 450, 000 inhabitants own the Pirkanmaa Hospital District.

The PHD is one of the largest hospital districts in Finland. It maintains a university level hospital (Tampere University Hospital, TAUH) and three regional level hospitals in Valkeakoski, Vammala, and Mänttä. 70, 000 patients are annually treated in the hospitals and 300, 000 in outpatient departments.

In 2002, the operating revenue of the hospital district was € 334 million. Almost 80 per cent of the revenue came from sales of health services to member municipalities and 10 per cent from sales to other municipalities. The rest is accounted for by other sales and income from special state subsidies. The operating expenses were € 316 million. Personnel expenses accounted for 68 per cent. The number of permanent personnel was 5, 400 (full-time equivalents).

The highest decision-making body of the hospital district is the Council of 80 municipal and university representatives. The Council elects the Board of 13 members to govern the hospital district. The Board represents the federation of municipalities.

The operations of the hospital district are grouped on two main levels. The corporate level is responsible for all the operations and some centralised services (such as Information Management), while the clinical and support operations have been organised into a number of units:

- The university hospital is organised into five health care service areas and three support service areas
- The regional hospitals (Valkeakoski and Vammala including the Mänttä health region) each constitute a unit
- The public utility unit Laboratory Centre also reports to the corporate level.

Each unit has a management group and comprises several sub-units. At the corporate level the management functions comprise of a management group of corporate level managers and an extended management group with managers from the operative units. Additionally, the regional hospitals and the Laboratory Centre have boards with representatives from the constituent organisations of the district (i.e. municipalities). In the case of the Mänttä health region, the municipal steering function is mediated by a steering group.

In addition to serving the population of Pirkanmaa district, the PHD has a particular responsibility of four other hospital districts adjoining it. These are the Päijät-Häme (Lahti), Kanta-Häme (Hämeenlinna), Etelä-Pohjanmaa (Seinäjoki) and Pohjanmaa (Vaasa) hospital districts (Figure 6). Together with the PHD, the population base is 1.2 million. The responsibility originates from the law regulating specialised health care. The National Health Project has placed additional emphasis on these responsibilities.

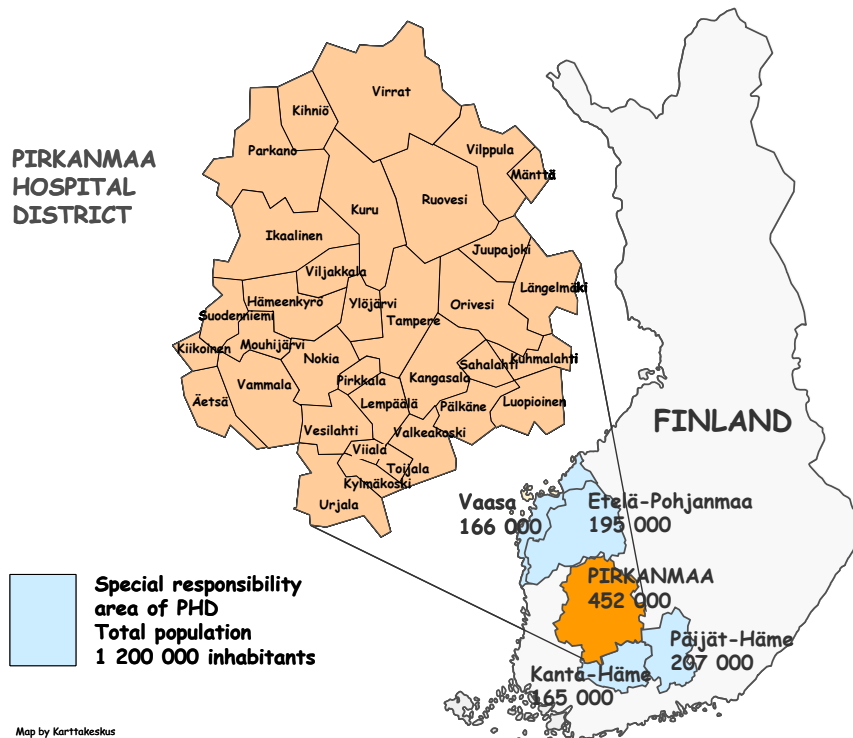


Figure 6. Pirkanmaa Hospital District and its special responsibility area with population numbers (Lamminsivu 2004).

In accordance with these particular responsibilities, the PHD has made agreements with the other hospital districts about collaboration and division of work concerning the delivery of public health care services in this extended region. The present agreement covers e.g. cancer therapy, diagnosis, and treatment of heart illnesses and endoprosthetic surgery. The agreement also includes development activities aiming at an integrated interoperable health care IT infrastructure and a medical imaging consultation service covering the particular area of responsibility of the PHD. Starting in 2005, the agreement additionally includes joint drug purchases.

5.1.2 Management, tools, and methods

Since the mid 1990s, efforts are underway at the corporate level to reorganise the service delivery of the hospital district and to develop methods and tools that support the management and administration of the operations of the hospital district. The most important corporate level innovations for this study are the process-oriented organisation, quality system, Balanced Score Card (BSC) approach, the system for managing purchaser - provider relations between the municipalities as purchasers and the PHD as the service provider, and management information system that provides the tools for management.

In the following, we give a brief description of current core activities and tools in the PHD management. The processes that have led to these corporate level innovations are discussed in more detail in chapter 6.

Process-oriented organisation

A process-oriented organisational format has been developed. Its first phase was implemented on 1st January 2004 and will be completed in the second phase on 1st January 2005. The resulting administrative and process organisation charts of the before and after organisation are presented in Appendices B and C respectively.

Quality system

The introduction and implementation of a quality system started in the early 1990s. The development of the quality system has been supported by four processes. The first has been extensive quality management training for the personnel at all levels of hierarchy. The others have related to quality improvement projects at grass root level, development of quality indicators and participation into quality award competitions at a national level. It also included preparation of a quality handbook, project specifications, and self-management procedures. Today, the quality system is fully implemented and used in all aspects of operations.

Balanced Score Card

Strategic planning, strategy implementation, and strategy assessment are based on the BSC. By mean of this system, strategic guidelines are formulated into concrete operational goals from five perspectives. These perspectives are customer, processes, personnel, reform, and economy. The annual planning and budgeting cycle sets targets and assessment intervals for specific indicators within each perspective. "Performance condition" is an example of the indicators used. It measures conceptions and attitudes of personnel related to work environment, organisational climate, work satisfaction, training, and relations to superiors. At the highest level, the BSC outputs are presented as "traffic lights" green, orange, red indicating on target, close to the target, or outside the target.

Purchaser - Provider dialogue

The PHD has developed and implemented a dialogue-based system called "steering by agreement" (sopimusohjaus)² to negotiate health service contracts with municipalities and to monitor how the contracts are fulfilled. This system improves cost control and

² The system is normally known by the name "steering by contract". We have, however, chosen to use a different name for it, because in the PHD case the negotiation and dialogue phases are prominent in placing the contracts and in monitoring their fulfilment.

the foreseeability of health expenditure at the municipal level. It also increases the effectiveness and efficiency of operations in the PHD (Pekurinen et al. 1999). The contracts are negotiated annually between the provider (PHD) and the purchaser organisations representing groups of municipalities in a certain geographical area of Pirkanmaa. “Steering by agreement” is not a synonym for the purchaser-provider model. The concept is wider. It refers to a process which starts by assessing the population's need for specialised health services, and then goes on to negotiating about services needed, about providers, division of labour between the purchaser and the provider, and the prices. It may cover all health services or just some. It is a collaborative model that seeks to consolidate resources and operations. It brings forward the mutual dependency of specialised and primary health care and the need for them to collaborate.

The planning cycle for the next year starts in the spring and is based on actual numbers from three previous years. The provider side of the district makes a combined “tender” to the municipality groups based on numbers proposed by the profit units. The dialogue is then started and concluded in the autumn with a plan and budget for the next year. The realisation of the plan is monitored during the year and if necessary, adjusted by mutual dialogue. The municipalities have access to the system through a web interface and can monitor the realisation of the contract on a monthly basis.

Management information system

BSC, the annual planning and budgeting cycle and the purchaser-provider dialogue are supported by datawarehousing and together form the management information system used by the PHD (Figure 7). Today, the datawarehouse is updated daily and can be used to provide statistics of performance up to the previous day. Both the municipalities and the profit centres have learned to make use of these services.

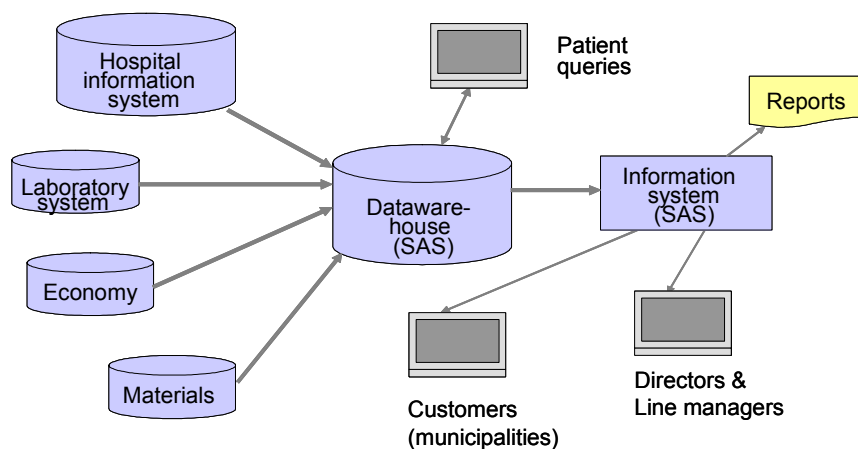


Figure 7. PHD's Management Information System (Lamminsivu 2004).

Benchmarking

Benchmarking is done at two levels. The National Research and Development Centre for Welfare and Health (Stakes) runs a mandatory benchmarking activity covering all hospital districts and health centres. It provides data that allows comparison of productivity, use, and cost of health care across public sector health care in Finland.

The five hospital districts that maintain university hospitals (one of which is the PHD) are developing additional and more extensive benchmarking methods to compare their performance against each other. However, although each uses BSC, their implementations are each unique, i.e. the basic indicators that they use are not the same. Furthermore, the PHD's implementation of BSC is the most extensive at the moment.

5.2 Scale advantages - Business level innovations

Since the late 1990s, the PHD management has sought to gain scale advantages with structural rearrangements. Figure 8 illustrates this strategy as it has been conceptualised by the hospital district management today. It presents nine cases of structural reform, four of which were selected for study here. The following cases were explored in this study:

- The Laboratory Centre
- The Coxa Hospital
- The Mänttä Health Region and
- The Imaging Centre.

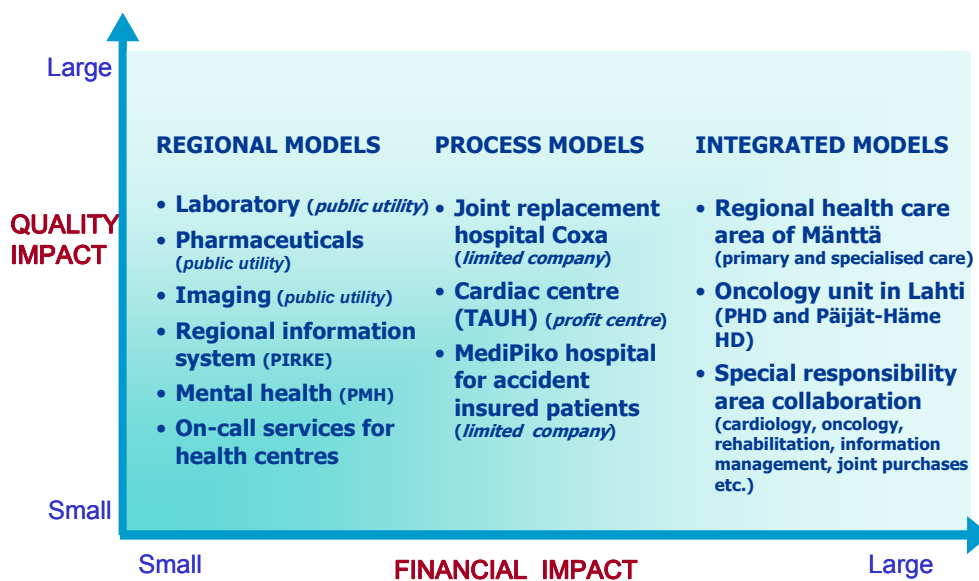


Figure 8. Scale advantages of structural reforms targeted by the PHD corporate management (the PHD management's document).

Most of the cases were considered unique in the Finnish context in the beginning. In all cases, the boundaries of service provider organisations have been redefined simultaneously with development of the services and application of new technologies. The *reform* has resulted in inclusion of some primary health care services in the PHD's responsibility.

The Laboratory Centre is organised as a public utility. It combines laboratory services in primary and specialised health care in Pirkanmaa into one operative unit. The Coxa Hospital is a case where a clinical core activity in specialised health care, i.e. endoprosthetic surgery, has been outsourced to a limited company. The Mänttä Health Region integrates the regional hospital with the primary care services of Mänttä and Vilppula. The Imaging Centre applies the laboratory model to create regional integration of imaging services for primary and specialised health care. See Table 2 as well.

One of the crucial decisions in these innovation processes related to the selection of a particular kind of judicial-economic organisational form. The options that were available included an ordinary profit unit of the PHD, a public utility owned totally by the PHD and a limited company owned partly by the PHD. The issues that required decision-making related, for instance, to ownership, managerial decision making, return requirements, personnel policy and customer relations, and pricing of services.

Table 2. Characteristics of the systemic innovations at the business unit level.

Systemic innovation	Description	Organisational form
<i>Coxa Hospital</i>	Outsourcing of clinical core activities	Limited company owned by the PHD, municipalities and private parties
<i>Laboratory Centre</i>	Regional integration of laboratory services	Public utility owned by the PHD
<i>Mänttä Health Region</i>	Regionally integrated unit of specialised and primary health care	Profit unit of the PHD
<i>Imaging Centre</i>	Regional integration of imaging services	Public utility owned by the PHD

Choosing the most appropriate organisational form has meant balancing between different advantages and disadvantages. Among the major criteria in these cases have been freedom to act and control resources vs. governance by the PHD, and personnel policy issues. The limited company form allows the unit to control its surplus, whereas in the cases of an ordinary profit unit and a public utility, the PHD makes decisions on surplus use. The limited company form also allows adjustment of personnel policy

according to the company's needs, whereas in the other two cases the personnel arrangements and wage policies are made in the PHD-wide context and not according to the needs of particular units.

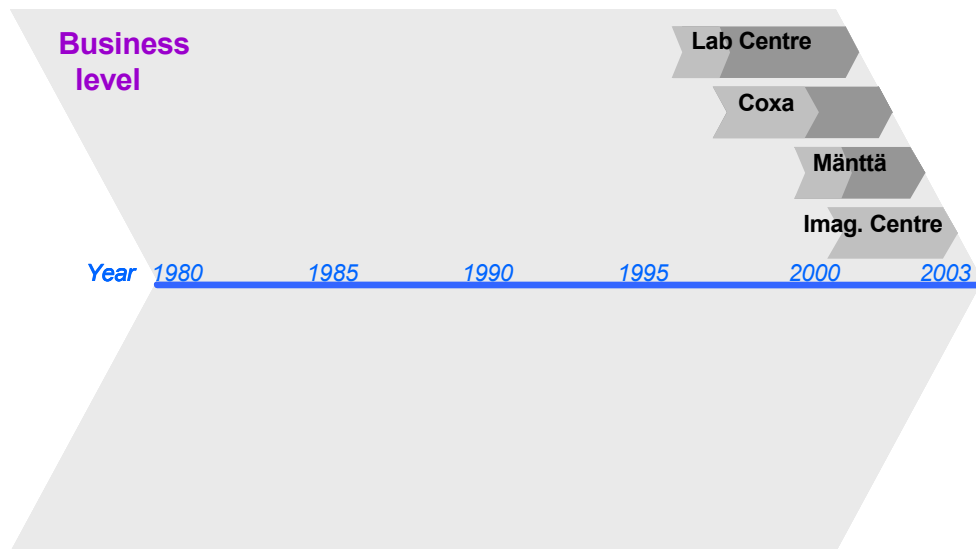


Figure 9. Timing of the reorganisations.

These four units are in differing developmental phases in terms of organisational reform. The Laboratory Centre, the Coxa Hospital and the Mänttä Health Region represent concrete rearrangements that have been carried out. The Imaging Centre started in September 2004. At the beginning of 2005, the reform process will continue with integration of regional pharmacy services into the services of the Laboratory Centre, though the planning of this process is not included in this study. Figure 9 indicates the timing of the innovation's development and implementation in each case. The light grey colour indicates the development time and the dark grey the implementation time.

6. Corporate level developments in the hospital district

This section aims to reconstruct developments towards new innovative structures on the corporate level of the PHD. It begins by describing some general district-specific cultural features related to innovation. It then goes on by describing different developmental phases in the hospital district's management thinking and strategy work. *The KISA actors* are identified in the text with italics. Here and there, we have illustrated our analysis with citations from the interviews.

6.1 District-specific cultural features

The interviewees perceived some cultural features in Pirkanmaa as drivers for innovative solutions. Many of the people interviewed referred to a "culture of scarcity and realism". It has been clear to the Pirkanmaa decision-makers for a long time that they cannot build their future on state support nor expect marked increases in it in the future. Consequently, there is a widespread understanding that the only way to manage is by being innovative. They remarked that people in Pirkanmaa are proud of their innovative approach to solving problems.

A director of the PHD mentioned the positive attitude of municipalities as another driver for reform. He considers discussions in the Council and the Board of the PHD relevant and objective, which is illustrated by the following citation:

"If you present an idea with good arguments (to the Council and the Board), it will be accepted."

He finds the roots for this positive atmosphere in history. The people in Tampere have learned to value competence and knowledge. Belief in innovation has been strengthened by the city's success in establishing two universities, Tampere University and Tampere University of Technology. Another victory within the district was establishment of a medical faculty at Tampere University in 1972.

"Pirkanmaa makes its future. It is not expected to be shaped by Helsinki... People here expect reform and innovation."

Besides these general cultural characteristics, the interviews also revealed the critical importance of strategic choices made on the level of the PHD. In fact, the evolving strong leadership and visionary management in the PHD have set the scene for structural innovations. This is described below.

6.2 Evolution of strategic management

The beginning of an innovation process can seldom be unequivocally determined. Setting the beginning is always a bit arbitrary. In this case, it seemed necessary to start rather far back in history. In terms of the structural reform processes, four qualitatively distinct phases in the PHD management can be identified (Figure 10). The changes between the phases are not discontinuous. Instead, each phase presents the beginning of a new development that is interlaced with previous developments.

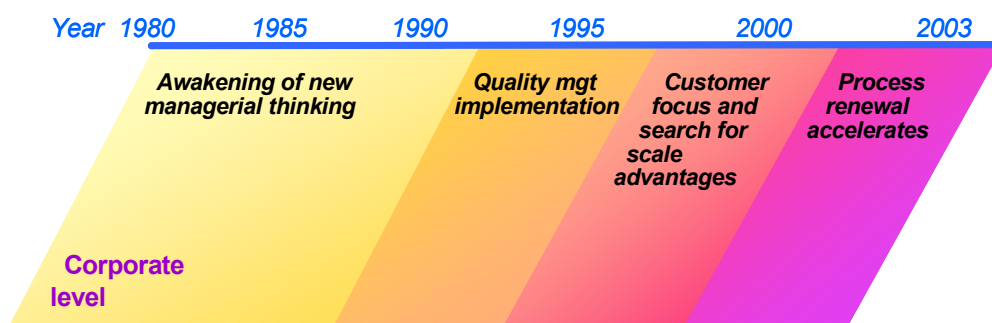


Figure 10. Description of the innovation processes on PHD corporate level.

The roots of corporate level innovation seem to date back to the beginning of the 1980s when the PHD management started to search and acquire training in the business managerial approaches that were in fashion at the time. The second phase started in the early 1990s and it related to implementation of the quality management system. While implementation continued in the late 1990s, the third phase was started by increased focus on the management of customer relations and by seeking scale advantages as a strategic target. Adoption of a customer-centred organisation model and the acceleration of process management characterised the beginning of the latest phase. The four phases and the role of KISA are described below.

1 Awakening of new managerial thinking (1980–92)

According to the interviews, the first roots to the structural reform process can be found in the mid 1980s, when managerial training was started in the PHD. The first seeds of change came from the business world where 'just on time' and 'management by results' thinking seemed to provide the keys to topical managerial problems.

The management of the PHD perceived some similarity between managerial challenges in health care and in business, and were interested in learning whether the same managerial approaches could be adopted by health care. Management training services were initially bought from *Posti Consulting Company* in 1982–83. Profit unit thinking started to gain ground in the hospital district in 1986–87. This was due to training in

management by results that was bought from *Yritystaito Ltd*³ and training in JOT-thinking that was bought from *Tampere University*.

II Quality Management system (1993-)

A new opening in the early 1990s was acquisition of competence in quality management (QM). In fact, the impetus for it came from *the Association of Finnish Local and Regional Authorities*. When the Association started to develop a national advisory board for quality in 1992, interest in starting local quality activities was aroused in the PHD, because locally arranged activities were considered to be more efficient. *A working group* comprising middle managers and people familiar with QM, political decision makers, and customer representatives from health centres was formed.

In 1993–94, *the Lahti Centre of the Helsinki University of Technology* launched its first Master of Quality (MQ) programme. *Turkka Tunturi*, Administrative Chief Physician of the PHD of that time, participated in the second programme in 1994–95. He got full support for this from his boss, Chief Physician Raimo Anttila. Tunturi was more than pleased with the training and encouraged his colleague *Kaija Nojonen*, Administrative Chief Nurse at the time, to participate in the next course. Both of them obtained abundant inspiration.

Nojonen was a member of the PHD management group and Tunturi was its expert member. They were in good positions to 'sell' the ideas to the management group. That was exactly what they did and quality management was incorporated into the strategy. Since then, the hospital district management has given full support to quality management activities.

The next challenge after obtaining corporate management's commitment was to pursue commitment of the rest of the personnel. Tunturi, Nojonen, and another PHD doctor, *Päivi Sillanaukea*, who was very interested in QM thinking, started internal training immediately. Nojonen's sphere of responsibility was not officially changed but after the strategic decision she spent half of her working hours in promoting quality management during the following ten years. So did Turkka Tunturi. *Juha Heino*, an enthusiastic young doctor from Toijala health centre, joined the training team by working half of the time in the PHD and half in Toijala. He later became Development Manager of the PHD.

The in-house QM training was based on the activities of those who were originally most enthusiastic. Management groups in all profit units got 2 to 3 day training in the

³ Yritystaito Ltd offers change management consulting services for public and private sector organisations.

theoretical foundations of QM. However, it was not easy to get everybody's commitment.

"In the beginning some people came to the training just to read the afternoon paper. But we were determined to go through with the training programme."

It was important to get chief physicians from different clinics as forerunners in training because the strongest change resistance came from the medical doctors. However, their resistance was hard to break. In fact, one of the chief physicians referred to an inherent conflict between medical education and quality thinking as a possible explanation for the resistance. According to him, there are three aspects of quality training that go against medical doctors' mind-set.

"Firstly, the systematic procedures. This is because doctors are artists who do things differently at different times; they want to do things their own way. The second aspect is the true customer orientation because in the medical profession a doctor is in the position of God in the sense that his doings do not depend on the customer. And thirdly, there is a need to document actions; this entails agreement and doing as agreed; doctors do not want to commit themselves but prefer maintaining the right to decide and besides, documentation enables others to do the same."

Major investments were started in QM training and education. A contract was made with *the Lahti Centre of the Helsinki University of Technology* concerning 'Pirkanmaa Quality' training. Twenty people from health centres and elsewhere participated in the 'Pirkanmaa Quality' course, which is shorter than MQ training. In addition, twelve people (chief physicians, chief nurses) participated in MQ training to make sure there was enough quality competence and inspiration in all profit units. During 1998–99, 300 superiors (doctors and nurses working as department heads) participated in a half day quality training course. It was not compulsory but in the event of absence, the person was to write a two-page essay on the subject. By 1999, the critical mass was reached. By 2004, 1500 employees altogether had been trained in quality management, 26 of them having participated in a one-year quality management course.

Quality projects started with two-day start-up training, where teams were given the basic quality tools. This training was carried out internally by Tunturi, Nojonen, Sillanaukee, and Heino. The team held a follow-up meeting after 3 to 4 months and within a year a final report was required. To motivate personnel, the hospital district developed an internal quality prize in collaboration with *Innotiimi Ltd*⁴. The respect towards quality work was increased by developing of a festive ceremony for award giving.

⁴ Innotiimi Ltd is a consulting company that is specialised in change management.

Already in the early 1990s, long-term systematic work was started to develop indicators to assess the job satisfaction of personnel. The 'performance condition' measure was developed in collaboration with *Tampere University's Faculty of Economics and Administration* and it was later modified and renewed in collaboration with the *Finnish Institute of Occupational Health*. The Balanced Score Card was considered a good framework or tool to focus on the critical activities driving success. The basis for the new data system was designed by in-house resources, and the information service manager *Hilkka Lamminsivu* has been the key person in this work. She describes the situation as follows.

"Our people are terribly demanding and they want things to be exactly according to their wishes. In Tampere we have always done everything by ourselves."

In 2000, the PHD participated in the Finnish EFQM⁵ competition and received an award. The process turned out to be very fruitful. In order to participate in the competition, the PHD needed to document its quality management activities (see *Paths to Success 2002*). This provided a good foundation for further development. The external auditors provided information on what was managed well and where improvement was needed. One of the key areas identified for improvement was the patient processes. This audit gave incentives for intensifying efforts to improve the processes.

To management's disappointment, the PHD's participation in the EFQM-competition in 2003 did not lead to an award. However, when the same application was submitted to an EU-wide public sector quality conference process, the PHD won a best practice award in spring 2004. It was selected as one of the best public organisations in Finland because of its comprehensive, long-term and challenging development work and for being a pioneer in many new practices.

III Customer focus and a search for scale advantages (1997-)

New developments were started on the foundation laid by progress in quality development work, the new profit-centre organisation formed in 1997, and the systematic corporate level strategic planning that was started in late 1990s. Below we will describe the two main directions of reform:

- 1) Managing customer relations with the 34 municipalities that own the PHD and pay for the specialised health care services provided to their citizens.
- 2) Search for scale advantages in terms of improved efficiency and quality.

⁵ EFQM is a not-for-profit membership foundation that serves its members' information and networking needs. It manages and directs the European Quality Awards.

Firstly, to improve management of purchaser-provider relations, the PHD carried out a three-year (1997–99) experimental project. This resulted in development of a model that is based on a dialogue between, on the one hand, the representatives of the municipalities and their primary care organisations and, on the other hand, the representatives of the hospital district. They simultaneously negotiated about financing, operations and division of work. The dialogue resulted in increased information, consensus and mutual trust.

As a result, a dialogue-based steering model was created. Since then it has been successfully implemented as the means to carry out a constructive dialogue on the annual budget and a monitoring process for it. The model is continuously evaluated and improved on the basis of actual experiences. In fact, today the PHD defines its customers as incorporating the municipalities, the patients, and the internal profit centres. Continuous development of customer relations has required an intensive collaborative effort of all staff members. This was described below by the information service manager.

"The last 12 years have been years of continuous change, and not incremental but great change. People know what to demand nowadays... The clinics know what information they can request. It used to be that the statistics sent by mail were always the same. And now it seems that there is always someone with innovative thoughts and things need to be developed... Our municipalities also know what information they can request. I am personally familiar with the negotiations, because I attend all of them."

Secondly, the search for scale advantages led to a redefinition of the boundaries of service and care provider organisations in laboratory services and endoprosthetic surgery. The Laboratory centre was established in 1999 and Coxa Hospital in 2002. The changes were characterised by careful balancing between corporate planning influence and autonomy on the municipal level (in making the decision whether to join the reform).

According to the strategic guidelines of the PHD, the PHD's services are to be developed on the basis of an understanding and forecast of customer needs. Quality management was mentioned as the tool for enhancing customer satisfaction on service availability, effectiveness, and the way services are delivered. Although the corporate level strategy gave clear directions, time was needed for business units to adapt to the strategy. The PHD's CEO was recognised for his "understanding that eliminating friction takes time". He himself describes the interactivity of the management culture in the hospital district as follows.

"The reforms are not railroaded through. A better result will be reached by giving time to discussion to reach consensus."

Another guideline in the negotiations with the elected municipal representatives of the Council and the Board was the importance of careful preparations of discussion items and proposals. The PHD's corporate management was aware that getting the elected officials to approve and back the reform processes required "facts and numbers, not promises". They made the effort to prepare financial calculations on the future benefits of the proposed reforms.

The already extensive QM training was accompanied by an extensive management training programme initiated in the late 1990s. The programme was started in lower management and it proceeded to cover all management levels. Managers of different spheres of responsibility are given a PD training package (Professional Development), the length of which is equivalent to MBA but the content of which resembles more a Master of Public Management. PD training was started in the late 1990s. All doctors and nurses in charge are also given a managerial training package of a few months' duration. Management training is provided by organisations like *Talent Partners Ltd*⁶, *Tampere University*, and *TYT*⁷. Those interviewed considered it fruitful to learn best practices from other fields and even from the business world. Actually, the PHD and *Talent Partners* have designed a training programme that brings insights from other organisations. This program is built on team work and visits to selected organisations to learn best practices.

The three-year MBA is offered to all directors of the PHD's profit centres. This programme started in 2001. Presently, a new MBA programme is being started at Tampere University. A major advantage in using this national programme is that it will be tailored to health care needs and more easily affordable to the PHD than, for instance, *INSEAD Executive Education* in France, which has also been used. INSEAD education, however, has been used especially in training management for an MBA in health care. Each year two or three managers participate in the programme which deals with issues like leadership, change management, and new production models.

When sufficient commitment to quality management was gained among personnel, development efforts were focused on the PHD organisation and processes. The PHD organisation was perceived to form a barrier to process thinking and for that reason it had to be renewed. Preparations for organisational reform on the level of the PHD were

⁶ Talent Partners Ltd is a management consulting company specialising in strategies, renewal of operation models, and change management.

⁷ The Institute for Extension Studies (TYT) at the University of Tampere is an adult education institute. It was founded in 1970.

started in 2001. One of the preparatory phases included exploring different solutions that were applied in other countries. With this view, the PHD management made several visits abroad. *A working group* was formed to prepare strategy for the PHD. The foundation for this work was laid by an administrative investigation of the municipalities' strategies and of the relevant documents related to the special responsibility area and those produced by the Ministry of Social Affairs and Health and the EU. It was considered essential that personnel and the elected officials were involved in strategy preparation. Seminars were held for officeholders and elected officials in the Council and the Board to discuss all BSC aspects: customers, personnel, renewal, finance, and strategy. The target was to formulate a mission statement extending to 2008. This work laid the foundation for financial and operation planning.

Several professional networks have contributed to development work. The PHD managers meet with municipal managers and city mayors a couple of times every year to exchange ideas. Meetings are held with other service providers when needed and chief physicians and chief nurses have regional advisory board meetings.

IV Process reform accelerates (2003-)

A working group was formed to prepare the process organisation. This group of 20 people incorporated the management group and the best experts who were committed to process reform. This group worked hard for a year, studying all specialised fields in order to identify new fields of activities.

Another working group (including a lawyer, financial director and administrative chief physician) was formed to revise the managerial appointment criteria. The target was (1) to flatten the organisational hierarchy and (2) to bring out managerial and clinical strengths. According to the new rules, in order to be appointed the candidate needs to have managerial training. Today, his/her PhD degree does not necessarily have to be in medicine, but may also be in nursing science. In autumn 2003, all manager appointments were reviewed. The fact that some lost their powerful positions naturally caused turbulence and bitterness among doctors. The other side of the coin was that gaining more time to use one's clinical competence may have come as a relief to others.

The first part of the new organization became effective in the beginning of 2004 and the rest will take effect in 2005. The customer perspective was the main principle of the organization design. The customer concept of the hospital district is composed of three tiers and there is a continuous need for balancing between them.

- The patients who are referred to specialised health care from primary health care, occupational health care or private clinics.

- The municipalities which pay for the care and services provided for their inhabitants.
- The internal customers, as the operations are organized in the profit domains and profit centres.

The new organization also acknowledged the importance of human resource management. *Juha Heino*, the development manager, had already been involved in the training of process management for a lengthy period. *New additional full-time persons in charge of development, personnel training and customer service* were appointed. Development and utilisation of internal competence was highly valued, which is illustrated by the following citation from the CEO:

"You must believe and have the will and the skill to do it on your own. You need to have healthy self-confidence."

The new organisational structure required renewal of the data system. A new management information system based on data warehousing is presently under development and the development work has been carried out by *Hilkka Lamminsivu*. Developing a new management information system means that data are collected from the very beginning and comparative historical data will be unavailable for some time. This, of course, causes some vulnerability for the organisation in the period of transition.

6.3 Corporate level developments with respect to innovation

One external expert described Pirkanmaa Hospital District's management as 'faultless' even earlier in its history, but stated that the appointment of the new CEO in 1996 and the new Chief Physician soon after made an important contribution to reform, even though it took two or three years for reform to start.

"It was luck that like-minded people, who did not have profession related tensions but similar views, were appointed to lead the PHD."

He claimed that the PHD management differed from that in other hospital districts in four senses:

- The PHD corporate management has been open-minded in experimenting and deviates from the conventional ways of doing things in hospital districts. Based on these experiences, 'not following others' has a positive connotation.
- For a long time, the PHD has been implementing quality management and training its managers and supervisors; this represents a modern way of thinking.

- The PHD management has avoided buzzwords in its strategy work. The interviewee described this management style as "programmatic" leadership. Strategy has not only been on paper but has been implemented in practice.
- And finally, the changes have also concerned corporate management itself.

Another external expert interviewed believed that the success of the PHD strategy work can be explained by two situational factors. One is the fact that the Ministry of Social Affairs and Health has not had a vision of its own concerning development of specialised health care. Secondly, the contact networks of the PHD's CEO at the national level have enabled the Pirkanmaa "innovations" to be recognised as national examples or models. He gave credit to the corporate management's ability to implement its strategy.

"The PHD management is admirably uniform. It really makes strategy for itself and makes an effort to gain others' commitment to it. Its strategies do not grow dusty on the shelf; they are put to use."

Many external interviewees remarked that the dialogue between the PHD management and elected officials in the Council and the Board has been given special attention and that there is a history of developmental collaboration. This has called for serious background discussions. Collaborative procedures are also being developed in some other hospital districts, but in Pirkanmaa there is already a long tradition of regular hospital district management meetings with municipal managers and it has been strengthened during the present management. One of the external service providers stated the following:

"If I were an elected official to the PHD Council or Board, I would feel that I can really influence things."

On the other hand, the PHD purchaser - provider dialogue was also evaluated. The following statement came from an external interviewee.

"The purchaser - provider dialogue was to increase competition and foreseeability. But it only brought about foreseeability."

Health care is not known for innovative reform of procedures in Finland, nor internationally. One of the experts interviewed says that hospital districts usually want to see how the pioneer is doing and if the result is good others will quickly follow. For instance, regional laboratory centres are being established elsewhere, too, now that the example of Pirkanmaa seems to work. Similarly, regional imaging centres are being created on the basis of the first steps taken in HUS and Oulu. Coxa, as well, has

provided significant impetus for new ideas. But, generally health care organisations do not want to be the pioneers in reorganisation.

Another issue to take into consideration is the size of the hospital district as “one size does not fit all”. The PHD ranks among the largest with HUS having by far largest population base. The PHD also incorporates a university hospital and thereby has special responsibilities towards the four adjacent hospital districts (as described earlier). Geographical area and population density play an important role. E.g. in Kainuu (with a population base of 90 000) a pilot is starting where all public primary and specialised care institutions have been merged into one health care organisation.

The next four chapters describe the business level developments in the PHD through four cases. The description is from the perspective of KISA in innovative reorganisation. The KISA actors are identified with italics.

7. The Laboratory Centre

7.1 The case of regionally integrated laboratory services

In this case, the laboratory services of specialised and primary health care have been integrated into one unit that serves the patients of all public health organisations within the hospital district, i.e. in specialised and primary health care, and also the patients of private doctors. The centre is a public utility of the Pirkanmaa Hospital District and therefore operates almost like a commercial company.

<i>Name:</i>	The Centre for Laboratory Medicine
<i>Organisational form:</i>	Public utility.
<i>Ownership</i>	Business unit of the PHD.
<i>Business idea:</i>	Provides laboratory services in the Pirkanmaa region to primary and specialised care organisations and to private customers.
<i>Volume (2002):</i>	4.3 million tests. Number of personnel 361
<i>Planning started:</i>	1998.
<i>Start date:</i>	January 1999.
<i>Description of innovation:</i>	Regional reorganisation of laboratory services based on centralised analysis, decentralised sampling, and an integrated laboratory information system for ordering tests and reporting of results.

The two major aspects of the change are the transition to a regional production model and the organisation of activities into a public utility. There are many simultaneous innovations that are included in the change process and they will be described below.

7.2 The innovation process

7.2.1 Planning of the reform

When tracing the history of the regional organisation of laboratory services, we need to go as far as the late 1970s. In 1976, the Ministry of Social Affairs and Health had given a national recommendation for central hospitals to work in collaboration with local health centres. In accordance with this recommendation, the Chief Physician of Clinical Chemistry in TAUH at the time initiated a dialogue aimed at collaboration. In 1980, sampling was decentralised so that samples were taken at the health centres of patients who had been referred to TAUH immediately before their scheduled appointment time in TAUH. Further progress in the direction was made. Discussion of regional

organisation of laboratory services in regular meetings of university hospitals and in national meetings of chief physicians of clinical chemistry began in the 1980s. Since the mid 1990s, studies were made on the effects of a multi-channel financing system on the pricing of clinical laboratory testing, on the production system and on the gross expenditure of laboratory organisations (Miettinen et al. 1998). This shows that the origins of regional solutions for laboratory service delivery go back a long way.

In the early 1990s, there were no quality requirements or quality systems in medical laboratory services in Finland. Sweden was more advanced in this respect. A field trip was made in 1993 to Karolinska Institutet⁸ in Sweden to learn about their accredited quality system. This inspired TAUH to start building a laboratory quality system of its own. Another factor contributing to the decision to develop a quality system was the fact that accredited quality systems were required in international pharmaceutical research projects, including the clinical trials that TAUH were conducting.

In 1995 TAUH laboratory units were nationally the first clinical laboratories that were accredited according to the requirements of the international ISO IEC EN 17025 standard. This started a wide debate on the quality of laboratory testing in Finland.

Interest arose at the Toijala health centre in developing an ISO 9001 quality system for their laboratory alongside this development. However, this proved to be difficult due to the small size (volume) of the laboratory. The solution in the end was provided by the regional Laboratory Centre and Toijala was one of the first to outsource this new unit.

Guidelines for regional development

This boosted interest in developing the quality and cost structure of laboratory activities in Pirkanmaa. In the mid 1990s, three guidelines were agreed as the baseline for preparing the regional arrangement of laboratory services.

- 1) Common quality standard
- 2) Client perspective and flexibility (local sampling)
- 3) Cost savings

Even though the hospital district could have met the regional challenges within its existing organisation, its management considered it important to establish a new regional organisation. They judged that municipalities, especially the welfare and health unit of the City of Tampere, would be more willing to collaborate with a separate unit than with the PHD. This is why the hospital district appointed *a working group* in 1997

⁸ The Karolinska Institutet is a Swedish medical university. It accounts for 30 per cent of the medical training and 40 per cent of the medical academic research that is conducted in Sweden.

to develop solutions for integration of the laboratory services of TAUH and those of the City of Tampere. The group incorporated several people from the hospital district and the municipalities. *Timo Koivula*, who was the Chief Physician of Clinical Chemistry in TAUH at the time, was the chair. Although the best organisational form was not discussed in the working group in the beginning, it was obvious that the City of Tampere favoured a public utility.

The basic targets for the future regional model were set in the following way.

- The solution for the quality issues was to be a single quality system for the whole, not accreditation of 20+ different laboratories.
- Resources were to be used more efficiently by increasing personnel's mobility across different operation sites.

Organisational form

In 1998, a decision was made to prepare the creation of the new regional laboratory, and a new working group was appointed. *Ari Miettinen*, Chief Physician of Clinical Microbiology and Immunology in TAUH, was chosen to chair the working group. When discussion started about the organisational form, *Reijo Hautala*, Deputy Mayor of Tampere proposed a public utility. The option of establishing a limited company was considered, but rejected. After all, the idea of the regional organisation of services was considered "radical enough". A public utility was estimated to have the same potential as a limited company, and it was chosen.

When the decision to form a public utility was made in early 1998, the laboratory of the City of Tampere decided to integrate its service delivery with the laboratory of TAUH. This decision was preceded by tough negotiations on personnel issues. Also, Toijala and Pirkkala municipalities quickly decided to integrate their services because this would provide them with easier access to quality accreditation. Toijala's and Pirkkala's decisions to join were important signs to other municipalities; the change was becoming real. The other municipalities started to feel pressure towards joining.

A billing-related regulation amendment that took effect in 1998 further improved the starting point of the new unit. According to the amendment, health centres and hospitals are allowed to bill private doctors' patients according to costs. The decision to organise the laboratory activities into a public utility proved good, as it provided an opportunity to operate almost as a commercial undertaking on the laboratory services market and to exploit the new business opportunities that the regulation amendment offered.

Automation of production and logistics

In order to increase the efficiency of the production process, the research and analysis services were to be concentrated in one location. To gain economies of scale, automation was required. Managing Director Ari Miettinen, *Chief Chemist Pauli Vuorinen*, and *Chief Physician in Chemistry Erkki Seppälä* played major roles in planning the reorganisation of the production system. The services of Delfoi Ltd, a *simulation company*, were used when planning personnel needs and the automated analysis system of the new production unit. Simulation provided an opportunity to test how the ideas would work in practice.

A new building was constructed to enable efficient and high quality service production with new large-scale automation systems. The building was designed to enable easy adaptation to changes in the scale of production. This was considered crucial as future growth was a strategic target of the profit unit.

It was decided not to have any facilities for customer service in the new building. However, because it was known that almost half of the samples would come from TAUH, and because the centre was to be responsible for testing and delivering blood products to hospital wards, it was vital to make sure that connections with the hospital were easy and safe. The hospital's proximity to the Laboratory Centre made it possible to build passages from the hospital complex to the Laboratory Centre; an underground tunnel and an air bridge connecting the buildings were constructed. Additionally, the modern pneumatic tube mail that had been built to connect the units of the University Hospital was used for fast transfer of laboratory samples and blood products.

A new logistic system and an efficient transport network from the sampling points in the regional hospitals and the health centres of the municipalities needed to be developed along with other development activities. The Laboratory Centre put its four transportation routes out to tender to transport companies. The bidding was easy to conduct. The longest route is somewhat over a hundred kilometres.

Renewal of information systems

Additionally, managing the change required gaining commitment of the in-house information system specialists to the process. After all, laboratory activities are very dependent on the information system, and it is not easy to replace one system with another. Tamlab, the laboratory information system that was in use in the PHD, was a product of internal R&D and had been outsourced a few years earlier to TIO, the IT unit of the City of Tampere (now also a public utility). *The IT experts of the Laboratory Centre collaborated with TIO* to adapt the system to meet the new requirements. As a result, the Tamlab has been extended to all primary health care organisations by a web interface to order examinations and to deliver laboratory results.

Parallel to this but later in time, the Pirke project was started in 2001. Its objective is to create a regional health care information network that allows all patient data to be shared and accessed across all primary and specialised care organisations in the area covered by the PHD⁹. The system is now in its early pilot phase and has been integrated with Tamlab. However, there are still no experiences of its usability as compared with the existing laboratory result services provided by Tamlab.

7.2.2 Adoption of the new structure

Managing relations with municipalities

The new organisation took effect in January 1999 and the unit was officially called the Centre for Laboratory Medicine. However, the new organisation was not implemented overnight. The hospital district management considered it important to give the municipalities the time and freedom to choose whether they would be willing to join the reform process, and when. In other words, the corporate strategy provided clear guidelines for reorganisation, but municipalities were not forced to make changes. This is why the change initially concerned only the laboratory activities of the PHD, the City of Tampere and Toijala and Pirkkala municipalities. Even this was not easy because there was a division of opinion in Tampere. While the Mayor and Deputy Mayors supported reform, the Deputy Mayor of welfare and health preferred to protect Tampere's own organisation and was initially against the co-operation. But agreement was reached.

Some municipalities were very hesitant to join and felt that "a big bear will grab you even though you are not willing to go". And, indeed, the municipalities expressed some suspicion about the effectiveness and results of the structural reform, as described by the following citation.

"Traditionally, there has been suspicion against the hospital district. It has been considered a bottomless purse. People have been afraid that it would constantly ask for more money."

Even afterwards, some municipalities did not feel that they had had enough time to prepare for the change. However, the fact that the independent profit unit organisation was functioning made it possible for the municipalities to see and evaluate the results of the new organisation. Waiting times were shortened, results were delivered more quickly, and quality requirements were met. An increasing number of municipalities

⁹ Patients will also have access to their electronic health records through this service eventually.

became interested in joining. From 1999 to 2002, the laboratory services of the PHD and 30 municipalities (all except four) were merged into this single organisation.

One of the issues where there were conflicting interests related to the number of sampling units that were needed in the district. The Laboratory Centre, on the one hand, was interested in centralising sampling into larger units in order to keep costs down. The municipalities, on the other hand, wanted to continue sampling at local health centres for employment-related reasons. According to the agreement made, local laboratory sampling was to continue and analysis alone was to be centralised. The Managing Director of the Laboratory Centre characterised his managerial role in the creation phase as "putting out a peat fire". There have been many unexpected "fires" popping up here and there and for that reason change management cannot be described as systematic. One of the fires was caused by the fact that several municipalities made independent, but simultaneous decisions to change their patient information systems without coordination of schedules. For instance, Tampere is a major customer and the Laboratory Centre was to react to the change immediately. Another one was created when several municipalities and two regional hospitals announced at the same time that they wanted to join the Laboratory Centre. It would have been easier to carry out the mergers one at a time.

Employee relations

Transformation of the production system meant major changes in personnel skill requirements and lowered the number of personnel needed. The bioanalysts in Finland are educated to do both the sampling and the analysis. As the analyses in the new Laboratory Centre are mainly automated, the bioanalysts employed are now overeducated in relation to their work requirements. Their versatility was needed when laboratory analyses were still carried out in small laboratories but not any longer. On the other hand, they are now expected to work more closely with the customers. Customer service is demanding in another way and requires skills different from those provided by the bioanalysts' training. The new situation presents many challenges for the Centre's management. One is related to the necessity of providing good customer service; another is related to dealing with personnel whose attitudes are not always favourable to the changes. The situation also presents a challenge for revising the education requirements of bioanalysts in Finland.

The administrative manager and personnel manager of the PHD have often been consulted in matters relating to change management. One of the paradoxical lessons that Ari Miettinen, the Managing Director of the new centre, learned related developing new modes of collaboration in administrative issues:

"We found out that in order to gain more independence from the PHD we need to work closely together."

Internal management relations

Ari Miettinen was one of the key change agents in the process. As a former laboratory Chief Physician, he had also been involved also in the preparatory phases of the reorganisation process. He characterized himself as a 'midwife' in the process. He explained his role in the citation below.

"An unusually large number of umbilical cords have had to be cut."

Because the Laboratory Centre was the first independent clinical profit centre, and thus 'a pilot case', the hospital district management did not, especially in the beginning, have a clear owner's policy towards it. Discussions have been going on and clarity is slowly increasing. Naturally, the organisational setting causes a need to strike a balance between control exerted by the PHD corporate management and the autonomy of the Laboratory Centre towards its customers, which include municipalities. The management of the Laboratory Centre hopes for more autonomy. Its position would also be made easier by clarification of the hospital district's demands like defining them, for instance, in terms of service prices, availability, and interest on invested capital.

"It is understandable that they do not want to give all freedom to a pilot public utility."

7.3 The Laboratory Centre from the innovation point of view

The success of the reform is discussed below from two perspectives: from the point of view of the PHD and from the point of view of diffusion of the structural reform. Firstly, we will consider the implications to efficiency and cost savings in Pirkanmaa.

The production volume of the Laboratory Centre has increased from about two million tests in 1997 to about 4.3 million tests in 2002. In 1997, as much as 89 per cent of the tests were ordered by TAUH while by 2002 the proportion of orders from TAUH had decreased to only 44 per cent. The number of personnel employed increased from 227 in 1997 to 361 in 2002 (due to the inclusion of the laboratory facilities of the municipalities). The number of tests produced per number of employees has increased by about 34 per cent (Miettinen et al. 2004).

In terms of cost savings, the effect on prices has been positive: the Laboratory Centre has been able to lower its prices by 30 %. However, exact change is somewhat difficult

to measure because the selection of testing services changes over time. The decrease in prices is partly due to increased flexibility in personnel use. Now that the laboratories' personnel work for one employer, personnel may easily be transferred from one sampling unit to another because every unit has the same data processing systems and standardised procedures and practices.

However, for example, in the case of the City of Tampere no actual savings have so far occurred. This is partly due to the fact that improved availability of the services has increased their usage and partly to changes in the type of testing services that are purchased. Tampere has increased its purchases for laboratory services by more than 50 per cent. This highlights the dilemma: although scale advantage tends to create savings, laboratory service costs do not necessarily decrease because more tests are ordered and ordering patterns tend to shift to new more demanding tests

As to diffusion of the reform, it can be seen today that the Laboratory Centre has served as an example for national development. Today, five other hospital districts (Kainuu, Pohjois-Karjala, Kymenlaakso, Helsinki and Uusimaa, and Varsinais-Suomi) have followed Pirkanmaa's example and established a public utility to provide regional laboratory services.

However, in Pirkanmaa the burden of being the first has meant having to participate in public debate and arguments for the reform. When the Laboratory Centre was established and started to offer services to the private sector at a lower cost, the large profits of private laboratories became visible. This resulted in a public debate where the Laboratory Centre's management pointed out that the reimbursements by KELA (the Social Insurance Institution of Finland), which are only paid to the customers of private laboratories, severely distort competition among laboratories. *The Ministry of Social Affairs and Health* contracted two experts to investigate the grounds for reimbursements that were used by KELA (Juva & Linnakko 2001). As a result of this investigation, lowering of KELA's reimbursement for privately paid laboratory services was included in a 2003 Government resolution as part of the National Health Project. The resolution also stated that laboratory services will be outsourced to units owned by one or more hospital districts, activities will be organised into independent profit centres, and the latest technology will be adopted. This, of course, added momentum for the reform of laboratory service delivery on the national scale.

The public debate on the reorganisation of laboratory services has brought to the forefront the issue of whether the public utility format is actually fair. (Miettinen et al. 2004, 2000; Pekkarinen 2000). Being part of a big provider organisation means that the unit has a safe market position. This base load of testing services creates scale advantages that allow it to market its services in the private sector as well. On the other

hand, the privately owned laboratory units cannot compete in the public sector as *de facto* “all” laboratory services are provided by the public utility.

Another concern in this context is the fact (this also came up in the reviews) that the public utility is not free to exercise its own employment policy. The events that have led to the creation of the Laboratory Centre mean that it acquired all the personnel working in laboratory services in the PHD area. The reorganisation of the sampling and analysis processes would have allowed a much more radical employment policy, which in turn would have resulted in more savings in the running of the unit.

A final concern relates to the National Health Reform project where an expectation was set that regional laboratory services will bring about considerable savings at the national level. The PHD example shows the way forward, but also the potential flaws of this plan. E.g. given the Finnish situation, how many regional laboratory centres do we need in Finland, one in each hospital district (20), one in each university hospital district (5), or even fewer? The other question relates to market conditions. Should these units be limited companies leading to real market conditions, or protected units operating within their respective hospital districts as public utilities?

8. The Coxa Hospital

8.1 The case of outsourcing clinical core activities

This case represents a change towards improved continuity of care from the patient's point of view. The term 'seamless care' is often used to refer to such aims. The term is relatively new in the health care literature. It usually refers to the desirable continuity of care delivered to a patient in the health care system across the spectrum of care providers and their environments. The objective is that care is carried out without interruption so that when one care provider ceases to be responsible for the patient's care, another care provider or health care professional accepts responsibility.

<i>Name:</i>	Coxa Hospital for Joint Replacement.
<i>Organisational form:</i>	Limited company.
<i>Ownership</i>	The PHD 35 %, the City of Tampere 20 %, Wittgensteiner Kliniken Ag 20 %, the Orton Hospital 5 % and four Pirkanmaa municipalities 5 % each.
<i>Business idea:</i>	Providing the PHD with endoprosthetic surgery and nation-wide services in the area of demanding endoprosthetic reoperations.
<i>Volume (2003):</i>	1494 endoprosthetic surgeries. Turnover € 12.7 million. Employs 11 specialised doctors, 46 nurses and physiotherapists.
<i>Planning started:</i>	1998.
<i>Start date:</i>	Company established in January 2001 Operations started in September 2002.
<i>Description of innovation:</i>	Outsourcing of all joint replacement surgery from the PHD into a limited company servicing patients from the Pirkanmaa region and private patients.

The chain of activities in endoprosthetic surgery starts from establishing a diagnosis, continues with surgery, and concludes with rehabilitation. There are a number of different institutions taking part in the chain of activities. The care process is complex and requires highly competent and specialised teams. Before the reorganisation, endoprosthetic surgery was performed by five public hospitals in the PHD while in the new organisation the PHD purchases all endoprosthesis surgeries from the Coxa Hospital.

The boundaries of service provider organisations were redefined by establishing a limited company, Coxa Hospital which specialises in endoprosthetic surgery. Its ownership structure is unique in Finland. It is a public-private partnership. The new organization means that the public hospitals in the Pirkanmaa district stopped doing

endoprosthetic surgery, but maintained their responsibility for primary diagnosis, rehabilitation, and post-control of endoprosthesis patients. Today, municipalities purchase endoprosthetic surgery for their inhabitants from the hospital district which, in turn, has a contract with Coxa (based on competitive tendering).

8.2 The innovation process

8.2.1 Planning of the reform

The roots of Coxa date back to the late 1990s when *Juha Nevalainen*, an orthopaedist in the *National Agency for Medicines*¹⁰, analysed the future needs for endoprosthetic surgery. The data for his work came from the national implant register to which all implant surgeries must be reported and which is maintained by the National Agency for Medicines. As part of his work, Nevalainen studied the quality of endoprosthetic surgery in Finland and found out that the quality varied a lot depending on the type of endoprosthesis used and on where the operation was carried out. His study suggested that the quality was not sufficiently good when made in small unspecialized units and that the variety of endoprosthesis types needed to be reduced. This study gained great publicity in national newspapers and TV programmes. Nevalainen also pointed out that the number of hip replacements will double between 1997 and 2015, owing to population ageing.

The evidence suggested that centralising endoprosthetic surgery in a large unit, instead of performing surgery in several small units, will raise the quality of operations and decrease the overall cost of such surgeries. It was also known, that long waiting times for surgery worsen the prognosis. That is also why the frequent long queues were to be shortened, as well.

Nevalainen's study opened the window of opportunity for the PHD to take action in improving its endoprosthesis surgery situation. TAUH started to collaborate with *National Agency for Medicines* in order to develop software to monitor the quality of implants used in the hospital. Actually, it was as early as in 1996 that Matti Lehto, an orthopaedist working in TAUH, had taken the initiative to start up a project for developing an information system to increase efficiency and cost control. A project was set and funded by the PHD. The information system TekoSet, that was developed, is today marketed by AmW Trading Ltd.

¹⁰ The National Agency for Medicines provides independent information about medicinal products and their consumption monitors the medicinal field overall, and issues regulations, decisions and guidelines.

In 1998, Nevalainen together with the then Managing Director of Finn-Medi Research, suggested that Orton, a privately owned hospital specialized in orthopaedics, and the PHD would jointly start to build a new organization for endoprosthetic surgery. A meeting was held, but Orton decided to withdraw.

The next meeting was held in 1999 among Pirkanmaa representatives. At the meeting, Chief Physician Ossi Auvinen and Assistant Director Heimo Holli represented the hospital district management and *Markku Järvinen represented Tampere University*. The other participants were *Juha Nevalainen from the National Agency for Medicines* and *Matti Eskola and Kalevi Lauslahti from Finn-Medi Research Ltd.*¹¹

As a result of the meeting, a project was formed to explore possible new forms for organising the chain of activities related to endoprosthetic surgery. The project management team incorporated Rauno Ihalainen, Ossi Auvinen and Heimo Holli from the PHD, Matti Eskola from Finn-Medi Research, and a representative of the *City of Tampere*. The management team called on *Professor Törmälä from Tampere University of Technology* and Juha Nevalainen to serve as professional advisors.

The management team commissioned Finn-Medi Research to conduct a preliminary study and named Kalevi Lauslahti as the project manager. As an outsider, Finn-Medi Research provided the neutrality and objectivity that was needed for the project. Additionally, using Finn-Medi Research's services provided access to the funding of the national Centre of Excellence Programme. One of the interviewees describes Finn-Medi Research as follows:

"There is a good local core team... Finn-Medi is an exceptional world of collaboration. Its core team pulls together and people trust them."

Matti Lehto, an orthopaedist who had recently moved from TAUH to a private hospital, Reumasairaala, was consulted in various phases of the study.

The preliminary study indicated that with a new organization model endoprosthetic surgery expenditure could be cut by one third. The cost savings would be due to the facts that the activity could be organized optimally from the point of view of endoprosthetic surgery, purchases could be centralized and that better quality could be reached in a large scale unit. The final report of May 1999 offered the first schema for a

¹¹ Finn-Medi Research is a partner in Finn-Medi, a pool of health care technology experts working in the Tampere district. Within the pool, Finn-Medi Research is in charge of start-ups, commercialisation, R&D services, and the development of innovation and technology transfer system. It is owned by Finnvera, the PHD, Finnish National Fund for Research and Development (SITRA), the Finnish Red Cross, the City of Tampere, the Tampere University of Technology Foundation, and the Tampere University Foundation.

centralized endoprosthetic surgery centre. Lauslahti presented the idea to Rauno Ihalainen, CEO of the hospital district, and gained his support.

Finding project manager

Ossi Auvinen, the Chief Physician of the Hospital District, asked Matti Lehto to act as project manager. Matti Lehto was tempted by the offer and accepted the position in January 2000. He started to gather arguments for the new unit not only from the quality improvement viewpoint, but also from the point of view of financial gains, as this would be another relevant argument to convince politicians.

Convincing the Council

Realizing the plan required first the approval of the PHD Council. Its approval was not self-evident, especially because the reform meant that the five local hospitals which at that time carried out endoprosthetic surgeries were to stop making them. From the municipal point of view, these reorganization activities initially seemed to be a threat to their own service delivery. However, in this case the quality arguments were strong enough to smooth out the resistance.

Negotiations needed to be conducted with municipalities. In these negotiations the lineup of the PHD managerial team showed its strength. Especially the role of the PHD's CEO was acknowledged by the Managing Director of Coxa:

"Rauno (the CEO) was fantastic in this work. Especially during these provincial visits, his calmness and credibility were absolutely crucial. I will always remember the atmosphere that prevailed. Rauno appeared in his own style, presented the project and the people. Ossi (the PHD's Chief Physician) on the contrary has his own role - his presence characterised preciseness and determination."

Organisational form

Rather soon, the question was raised whether the proper organisational form would be that of a public utility or a limited company. The Laboratory Centre was put forward as a successful model of the public utility form. Matti Lehto studied the aspects that would be related to both alternatives. He made a list of implications of each alternative choice from the point of view of, for instance, legislation, taxation, professorships, and rights to use grants. He discussed the choice with Ari Miettinen, the Managing Director of the Laboratory Centre to hear about his experiences. He also discussed the matter with *Asko Koskinen*, Director of Finance for the City of Tampere, who was in favour of a limited company form. Lehto's comparison suggested using the same form. The issue was under active consideration for three months.

In March 2000, the PHD management group made a decision that a limited company would be formed. They reckoned that operating within the public organisation would have resulted in an overly rigid structure. Arguments for the limited company model related to the shortage of orthopaedists; a rewarding wage policy was needed to attract good orthopaedists and this would not be possible in a public hospital. Another major argument related to the fact that the plan was to sell endoprosthesis services not only to the PHD but also to its special responsibility areas, to the whole country, and even abroad. The limited company form provided better capacity for quick changes. Other important aspects were described by the Managing Director as follows:

"I guess the main reason favouring that alternative was the fact that as a public utility our profits would not benefit us, but would instead go into that 'Moloch's mouth'. We were aware of Companies Act concerning a situation of something going wrong. But we decided to take the risk."

Stakeholder negotiations

There were several articles in Finnish newspapers about the plans to establish a new endoprosthesis hospital. By chance Uwe Preusker, who was the Chief Editor of *Medizinaktuell* (a professional journal published in Germany), and who lived in Finland, learned about the plan and wanted to discuss it. Inspired by the plan he wrote an article about it in the German journal. After this article a German private hospital, Wittgensteiner Kliniken Ag, which had been interested in marketing surgery services to Finland, indicated its interest in becoming a shareholder in the prospective company.

"This was a surprising piece of news to us! We felt that if the outsiders had considered the plan 'odd' this far, now they will regard it as 'really strange'. I was feeling dizzy myself to think what this is all about. Then a private German jet landed at Pirkkala airport and we met each other. They turned out to be bright people!"

Negotiations were held between the PHD corporate management, Matti Lehto, and the Wittgensteiner representatives. In October 2000, the Germans invited the Finns for a visit. The Finnish delegation incorporated Ihalainen and Auvinen as the PHD directors and Lehto as the project manager. The mayor of Tampere had taken a favourable position on the endoprosthesis hospital plan from the very beginning and *Juha Kostiainen, the Deputy Mayor responsible for industry*, also took part in these negotiations. As a result, an agreement was made. During the process, Wittgensteiner Kliniken was acquired by an American company, but this did not change the plan.

Parallel to this, stakeholder negotiations were conducted with two Finnish private hospitals. With Orton hospital they resulted in a partnership agreement, but negotiations with the other hospital were dropped. In the end, the ownership was divided as follows:

the PHD (35 %), the City of Tampere (20 %), Wittgensteiner Kliniken Ag (20 %), Orton hospital (5 %) and four Pirkanmaa municipalities (5 % each). Coxa Ltd was officially established in January 2001.

Building new premises and making finance calculations

Initially the plan was to rent premises for Coxa from the City of Tampere. However, it became evident that a specially designed building would be more optimal. Matti Lehto, the Managing Director of Coxa, made a tentative plan for the hospital building together with an *architect* who was contracted for the purpose. They made preliminary schemas for the future activities and requirements set by them.

"It was big job to think how this hospital would work, what activities are needed, how they will be linked to TAUH activities and to the own internal process, how the out-patient department works, what volume and kind of space is needed, how many operating theatres will be needed, and what the future looks like, that is the next 20 years... We needed to figure out what kind of systems there will be, will there be digital imaging, will we use internal or external imaging services, how many patient beds will be needed, how long care would take, will maintenance services for instruments be organised internally or purchased, where will blood products be needed and stored..."

A *consultant* was contracted to prepare the invitation for tenders. The invitation was published in the beginning of January 2001, giving two months for submission of tenders. The design and build concept was used. This is a system where an architect and a building constructor form a team and where the building costs are fixed. There were four bidders for the design. The plans were reviewed by orthopaedists and nurses from the PHD and civil engineers from the City of Tampere. The winning design was made by the *architect Pekka Koivula*. An agreement was made with a building contractor Engel Ltd, in March 2001. The new building was to be annexed to TAUH.

Along with the start of the building project in 2001, it was necessary to start designing and building the information system because it would be related to everything else. As early as January 2001 a *data system designer* was employed for that purpose. Other things needing the project manager's attention included the planning of the digital imaging system, expediting the information technology project, and designing a new kind of incentive wage policy. Lasse Kärki, the financial director of Coxa, was responsible for all the financial calculations necessary for carrying out the project. No external expertise was needed.

Recruiting personnel

Recruiting of the personnel took place in spring 2002. One of the targets from the beginning was to design the terms of employment so that Coxa would attract the best orthopaedists. Lehto designed an incentive-based pay system for the doctors. Their salaries and incentives were considerably better than those of the public sector hospitals. Coxa managed to get excellent orthopaedists and they are pleased with their terms. Lehto also hired a head nurse with whom he designed the terms of employment for nurses.

"We put an announcement in a newspaper about recruiting 50 nurses and physical therapists and we got 800 applications."

In addition to recruiting new personnel, Lehto had to plan a training program that would ensure that the newly employed professionals would know how to work in the new hospital. Two weeks before operations started the personnel came for the training.

8.2.2 Adoption of the new structure

Coxa started its operations in late 2002. The situation was novel and it came almost as a surprise to the Coxa management that the PHD was compelled by law to arrange competitive bidding for endoprosthetic surgery purchases and that a competitive tender was, indeed, made by another private hospital. This was not expected. However, Coxa won the first competitive bidding for the first two years 2003-04. Coxa won because it was able to guarantee to meet the education and research related responsibilities better than the competitor.

At the moment, Coxa sells most of its service to the PHD. However, it also offers services for private patients and they currently represent more than 10 per cent of Coxa's customers.

8.3 The Coxa Hospital from the innovation point of view

The success of the reform will first be considered from the point of view of its implications for the PHD. Changes in two aspects, i.e. quality and efficiency, are examined. Secondly, we will discuss the opportunities for diffusion of this kind of systemic innovation.

The follow-up data indicates that infections following endoprosthesis operations have fallen dramatically in Pirkanmaa. Generally it is considered a good achievement if the

percentage of patients getting an infection afterwards is lower than 1. In Coxa, the percentage is only 0.3. The number of patients requiring renewed surgeries has also decreased, which is due to the higher quality of the operations. Coxa even gives its patients a 10 year guarantee; if a renewed operation is needed during this time the patient gets it at a 50 % reduction in price.

The time that the patient stays in the hospital has been shortened. The patient comes for a check up two weeks before the operation. He/she comes to Coxa on the morning of the surgery, stays there for three days, and then goes to a rehabilitation unit. In 20 per cent of the cases, the patients go straight home.

These shortened hospital stays would not have been possible without reform of rehabilitation processes in primary health care. In fact, in Coxa's development phase it turned out that local health centres and regional hospitals would have to change their rehabilitation processes because agreements with Coxa would mean that patients are discharged more quickly from the hospital. It must be remembered that speed in one phase of the care process (in Coxa's surgery) does not necessarily guarantee the efficiency and effectiveness of the whole process.

The new organisation and the premises have enabled improved processes. The efficiency of orthopaedists has been increased by the fact that they can now operate on more patients per day. The opportunity to concentrate on endoprosthetic surgery only increases the quality of work. Another illustration of increased efficiency is the fact that preparing the operating theatre for a patient used to take 1.5 hours (in TAUH), but only 19 minutes in Coxa. Personnel also report high job satisfaction.

One of the disappointments is that after two years of operations, the queue of people waiting for operation has not decreased in Pirkanmaa, rather the opposite. The Chief Physician of the PHD commented on this by stating that the queues will not get shorter before municipalities allocate more money for endoprosthetic surgery. Coxa can operate more if the municipalities purchase more surgeries.

"In 2003 Coxa performed 1490 operations. It would be possible to do 3000 if the municipalities had the money to invest in this patient group. The recommendations of the National Health Project will necessitate this¹²."

It can be assumed that keeping patients in a queue is often much more expensive to municipalities and to society in the long run than giving treatment in time. This

¹² Based on recommendations of the National Health Project there will be amendments to legislation that improve the availability of care for citizens. Starting in March 2005, health services will be guaranteed for citizens within certain time limits.

relationship has been studied, but the results are said to be controversial (Vehviläinen et al. 2004; Klaukka & Häkkinen 2004). In the case of joint replacement, patients are typically of the age that they do not return to working life after the operation, and shortening queues may not be justified on the basis of lowering economic costs, but rather on the bases of improving the quality of the life of senior citizens.

Another challenge for the future relates to Coxa's possibilities to carry out R&D projects connected with implants and biomaterials. This was initially set as a target and currently there are several ongoing studies on the subject carried out in collaboration with both local and international institutions.

During 2003, Coxa's financial result was better than what was expected. Its turnover was € 12.7 million, and the surplus from the period was 736 000 €. However, the losses carried over from previous periods are € 1.3 million, and the level of long-term debts is € 13 million. With a share capital of € 2.86 million, Coxa's gearing ratio remains unsatisfactory. A balancing factor, however, is good liquidity.

When assessing Coxa in terms of diffusion, we need to ask how many endoprosthetic hospitals Finland actually needs and what the market conditions on which they operate are. The same issues that have been raised in connection with the laboratory centres apply here (see end of Chapter 7).

9. The Mänttä Health Region

9.1 The case of regionally integrated health care

The Mänttä Health Region case represents integration of specialised and primary health care services into a regional service system. The regional unit operates as a profit centre of the hospital district. The innovative feature in this arrangement is that the administrative boundaries between specialised and primary health services have been removed and that it incorporates a seamless process from the customer's point of view. The CEO of the hospital district expresses it as follows (Paths to Success 2002)

"What is new about the health care district of the Mänttä region is that health services are viewed as a single entity from the citizen's perspective. Services are produced flexibly according to the customer's service need without administrative boundaries or operational compartmentalisation."

<i>Name:</i>	Health Care District of Mänttä Region.
<i>Organisational form:</i>	Profit unit of the PHD.
<i>Ownership</i>	The PHD.
<i>Business idea:</i>	Provision of integrated health services in the Mänttä region.
<i>Volume:</i>	Responsibility for specialised health care for a population of 42 000. Responsibility for primary health care for a population of 12 500.
<i>Planning started:</i>	Spring 2000.
<i>Start date:</i>	January 2002.
<i>Description of innovation:</i>	Regional reorganisation of primary and specialised care services by combining them into a single organisational unit.

The health centres of Mänttä and Vilppula and the regional hospital have been combined into one organisation. The social services and environmental health services of these municipalities are excluded from the merger. The whole reorganisation targeted on eliminate of overlap, allocating appropriate resources and cost cutting.

9.2 The innovation process

9.2.1 Planning of the reform

Problems rooted in history

Since the 1870s, the history of Mänttä has been dominated by the Serlachius pulp and paper mills, which were the major employer in the region and which also took considerable social responsibility. In the early 1950s, the municipality started to take more responsibility for health care, but even then Serlachius financed a major part of the new hospital investment.

During Serlachius' time, Mänttä was a prosperous municipality. Health care services were reasonably good and residents of the region were accustomed to using them. The great role of the forest industry in the region became apparent in the financial problems faced by the municipality when industrial money started to diminish in the 1990s.

In the late 1990s, the health care expenditure per inhabitant in Mänttä and Vilppula, the neighbouring municipality, was higher than in the other municipalities of Pirkanmaa. This provided the primary impetus for the “rescue mission”, a reform of the health system. Additional problems related to the declining population in the region and to its ageing.

The high health care expenditure was almost totally explained by the higher average use of primary and specialised health care services as compared to other regions, and therefore also by the higher average supply of health services. Use of health care services in Mänttä region differed from that in other regions with regional hospitals. The productivity of the hospitals and health centres did not explain the differences.

External advice to preparations

In 2000, the Pirkanmaa Hospital District corporate management commissioned *Development Manager Markku Pekurinen from Stakes* (the National Research and Development Centre for Welfare and Health) to study how services could be reorganised. Pekurinen's earlier studies, which he had carried out together with *Maijaliisa Junnila and Ulla Idänpään-Heikkilä*, on purchaser-provider relations had convinced the PHD management of their expertise. Contracting external experts was also motivated by the need to remove excessive suspicion of the municipalities. The views of external consultants' would be considered more 'objective'.

"Municipalities are often a little frightened by everything that comes directly from the hospital district."

On the basis of his study, Stakes suggested five options. One of them was the integration of specialised and primary health care into a PHD profit unit and keeping social services as a separate municipal responsibility. This option was chosen. All the proposed options were based on the assumption that the regional hospital would not be closed down as this would not have been politically possible.

Finding project manager

The hospital district's Council had made a decision to convert the Mänttä Health Region into a separate profit unit. However, it was not easy to find a manager for the project because the reputation of the region was not good. The region was considered "a strange neck of the woods". Päivi Sillanaukee, who took the position, started her work in the spring 2001, before formation of the new unit structure. Collaboration with *Talent Partners Ltd* gave her support in designing the change in Mänttä.

Target setting and the management information system

At that time the municipal health delivery system was making a considerable loss. The target that was set for Sillanaukee's work was to bring the cost of health care per inhabitant closer to the medium in the district. She was given two guidelines for the project. Firstly, the regional hospital was to be continued. Secondly, nobody was to be discharged or laid off. The results would be evaluated after three years, in 2005. Later, the PHD made a decision to speed up the change process so that the process would be evaluated (by *Stakes*) one year earlier than initially scheduled, i.e. at the end of 2004.

The target has been difficult to reach for many reasons. This was partly due to the guidelines mentioned above and partly to the fact that the target was not clearly defined. The target stated that costs should be "lowered" without reference to any exact numbers. Still another difficulty was caused by the fact that Sillanaukee's responsibility covered the specialised health care of several municipalities in the region and the primary health care of two municipalities, Mänttä and Vilppula. The planning and budgeting systems of these were not easy to combine, and this caused some major financial confusion during the first two years. Not only was some of the information relating to primary health care delayed for a considerable time, but there were also major errors in estimates. This tended to erode the trust of the municipal decision makers towards the unit management. The accounting problems eventually led to a takeover of Mänttä Health Region's finances by the PHD. This would have been impossible to do at the beginning of the project because there was so much suspicion of the PHD in the region.

9.2.2 Adoption of the new structure

The new unit structure came into force in January 2002. The official name of the unit was the Health Care District of Mänttä Region. Päivi Sillanaukee was appointed Managing Director.

This case differs from the other cases in many ways. The whole case was described as a “rescue mission”, whereas the other cases were conducted in less turbulent circumstances. Due to the nature of the mission, there was considerable tension in relations with the municipalities. Another related difference was the extremely short time span of the preparatory phase. The timetable that was given to Sillanaukee required quick decisions in order to find out how the new arrangements would work. There was not time enough to build consensus prior to decision making. As a result, the reform process was characterised by considerable change resistance among municipal representatives, personnel and residents of the region. Issues were also debated in local newspaper articles.

Management of relations with municipalities

The forms of co-operation with the municipalities' elected officials needed to be changed. This was due to the fact that as the PHD became the owner of the primary health care services that Mänttä and Vilppula had so far produced themselves the PHD Board and Council became the factual decision makers for this unit. Previously, decisions regarding primary health care were made by elected officials of municipal health boards. These municipal health boards were now terminated and elected officials no longer had the direct decision-making power that they used to have. The new management model, a 'steering group', incorporates officials and the elected officials of the two municipalities who together prepare matters for decisions by the PHD. Initially, the elected officials criticised this change but later they realised that their opportunities to influence issues in the preparatory phases had actually improved and their satisfaction increased. In the new structure, the municipal representatives have more power to influence the content of decisions as they participate in their preparation. The steering group incorporates the top officials of the municipalities. The advantage here is that the unit management needs to do less lobbying in the municipalities and quick decisions are possible.

Recruiting and employments

Before the reform started, Mänttä Health Region had been in the position of a "spittoon" for a long time. It was considered "a complete failure which nobody wanted to support". There were no applicants for doctor vacancies in the Mänttä region.

Sillanaukee considered that improving the image of Mänttä would be one of the most important tasks for improving the whole situation. Improving the image was necessary so that doctors could be recruited to the region. She devised a solution whereby doctors employed in TAUH would also work part time in Mänttä. In this way, the image of those positions was better and it became easier to find applicants. Sillanaukee said this arrangement resulted in a new kind of trust in Mänttä Health Region and that the psychological effect was considerable. Another major improvement that resulted from this arrangement was that competence from TAUH specialised care was transferred to the Mänttä region. According to Sillanaukee, this would, in fact, be one of the keys to an even general reform of health care:

"It is essential that competence is made more and more mobile in the service network. This is the way to distribute it more evenly."

To cut costs, activities were reorganised. Some of the work that was previously done by doctors was transferred to nurses. The nurses' competence was used especially in screening people who needed a doctor's care. This initially caused dissatisfaction among the residents, who were used to seeing a doctor whenever they wanted to. Articles expressing critical opinions of the change were published in the local newspaper. The managing director expects that these 'care guarantee teams' will result in four out of five people getting help from a nurse and thereby reduce the need for physician services.

Managing change resistance

For personnel, the reform meant having to adjust to changes. The local health centre (a rather new building) was closed and primary health care was transferred to the regional hospital building, and employees' responsibilities underwent changes. There was considerable stress and change resistance among personnel. A *psychologist from the Finnish Institute of Occupational Health*¹³ was invited to hold 'ventilation days' for middle management in order to smooth out the change process. This provided middle management with a chance to ask about the reasons for the changes so that they need not have shared the suspicions of the rest of the personnel. The *in-house occupational psychologist* served as a channel for conveying information on the feelings and experiences of personnel to management. The psychologist held 'development seminars' which eased adaptation to changes. This kind of psychological support system had not been used in the prior change processes in the PHD.

¹³ The Finnish Institute of Occupational Health (FIOH) is a research and specialist organisation in the field of occupational health and safety. The Institute's goal is to promote the work ability, functional capacity and health of the Finnish working population and to enhance their quality of life.

In managing change, a major difference between the private and public sector is the attitude of personnel. The managers interviewed referred to this difference many times. The following citation illustrates their experiences.

“In companies, the employees ask “where can my expertise be used”, whereas in health care, the attitude is “I’m a nurse, I’ve always been”.”

In the spring of 2004, the managing director of the unit described the hard work and optimism that had resulted from it as follows:

"There has been no model to follow. We have just tried to figure out how to make everything go more smoothly as we went along. Now we have reached the top of the hill."

She considered it a major achievement that a shared understanding of the need for the change process was gained in the region and that the actors had learned to work in a network (as a team). However, she also expressed criticism of the PHD's management process. She thought that managerial insight on change processes and their practical requirements and implications should be improved. She was critical of the fact that in Mänttä the change process had to be carried out without proper preparations.

“Now we are puffing on top of the hill. Personnel should be given a chance to catch their breath.”

She considered her executive MBA training as a critical personal safety valve during the tough process of managing the change. The training was organised by *EduTech* and *TYT*.

According to the managing director, there are two major challenges to face in the future. One relates to securing financing for the regional hospital. The "burning question" from the start has been whether to continue maintaining the regional hospital in Mänttä or to close it down. The other is related to securing the availability of specialised physicians close to the network of primary services; surgeons and internists are needed in the Mänttä Health Region. After all, there is a general risk that specialised health care resources will be concentrated in large university / central hospitals and that the gap will widen between primary and specialised health care. Sillanaukee argues that university hospitals have an inward looking culture of their own:

”You must step out into the field in order to sense the reality.”

She says that the PHD's management as well as the Council and the Board have given her work their full support. However, she thought that management should have supported this kind of reform processes further, for instance, by relaxing the rigid deadlines for the annual planning and budgeting system to provide flexibility. At the time, she herself tried to smooth the process in Mänttä by keeping budgets open for an exceptionally long period.

Having managed the critical transition stage in Mänttä, Sillanaukee went to work as an advisor for the City of Tampere in the spring of 2004. She was given the responsibility to prepare a plan for health care structural reorganisation. A new managing director was appointed to continue her work.

9.3 The Mänttä Health Region from the innovation point of view

Establishing the Mänttä Health Region has meant reform and a reduction of health services in the region. The reform has so far mainly covered functional integration of primary and secondary health care and investments in prevention. The next logical step would be to formally incorporate all elderly care services in the Mänttä Health Region. Although integration was considered necessary from the beginning, the municipalities were not initially prepared to take that step.

One of the problems in the Mänttä case was that it was started as a rescue operation. Before the reform, the Mänttä and Vilppula situation was alarming in terms of employment and the cost of health service provision. It was obvious that securing the local availability of health services would call for reorganisation. When considering the options, however, political realities had to be taken into account. It was not possible to consider the implications in terms of regional health service alone; employment aspects also needed to be considered. This seemed to necessitate rescuing the regional hospital. A critical comment of one of the interviewees expressed the problem as follows:

"I guess Mänttä was a rescue mission. What was rescued was the regional hospital. Critics say that "...at the expense of primary health care".

This statement, however, can be evaluated only after the assessment report is published.

From the point of view of diffusion of this structural reform, Mänttä was not an optimal setting for experiment. This is because achievement of the financial savings that were targeted was hampered by non-health care related reasons. For instance, closing down of the regional hospital could not be accepted because of the economic and social

consequences that would have incurred to the municipalities already suffering from unemployment.

An external expert estimates that the gains that were sought in Mänttä will be hard to achieve. The present day population base is simply too small for a regional hospital. According to him, the current reform can be seen as preparing the ground for another systemic innovation.

The outcomes of the three-year reform process will be assessed by Stakes by the end of 2004 (Junnila 2004). This assessment will incorporate interviews with key actors and measuring attitudes of inhabitants and personnel in different phases of the reform, as well as the register-based study for 1998–2004. This study will provide useful information on the barriers to and carriers of the systemic innovation as well as assessment of its outcomes.

10. The Imaging Centre

10.1 The case of regionally integrated imaging services

This case provides another example of integration of specialised and primary health care activities, but in this case within the domain of medical imaging. The activities are organized into an independent profit centre of a hospital district which provides the possibilities of operating like a commercial company.

<i>Name:</i>	The Centre for Medical Imaging
<i>Organisational form:</i>	Public utility.
<i>Ownership</i>	Business unit of the PHD.
<i>Business idea:</i>	Provides imaging services in the Pirkanmaa region to primary and specialised care organisations and to private customers.
<i>Volume:</i>	None yet (planned 165 000 examinations / year).
<i>Planning started:</i>	2001.
<i>Start date:</i>	September 2004.
<i>Description of innovation:</i>	Regional reorganisation of imaging services based on centralised reporting and archival, distribute imaging and an integrated information system for ordering and reporting of results and distribution of images.

The formation of the Laboratory Centre has influenced the development of the Imaging Centre in many ways. This can be seen in the following description of events. One of these was that the Laboratory Centre provided a model for successful adoption of a public utility organisational form. Another influence was related to the pace of integration of municipal services. In the case of the Laboratory Centre, the pace was sometimes experienced as too fast in some municipalities. This is why in the case of the Imaging Centre, the municipalities were given time to assess the pros and cons of joining the Imaging Centre.

10.2 The development phase of the innovation process

There are two general trends that tend to increase the demand for medical imaging services. One is related to the ageing population that will increase the demand for care services and the other is related to advances in technology that make it possible to treat more and more illnesses and people. Today digital imaging is a critical element in diagnostic and therapeutic services. Developments in information technology have resulted in the full digitalisation of former analogue film-based imaging equipment. Parallel to the new imaging modalities, first CT then MRI, have emerged and they have

totally changed the landscape applications for digital imaging in health care. As a result, the domain that was previously known as radiology is today mostly called medical imaging. Presently, imaging provides the required visibility for interventions inside the human body. The other side of digitalisation is that film is no longer needed to store images. For several years, information systems have been marketed that interface with digital image acquisition systems (using the DICOM standard) for the archival (storage), communication, interpretation and visualisation of images (called PACS).

Although this technology is more expensive and its life cycle is shorter (i.e. 8–10 years instead of 15) as compared to analogue technology, it provides considerable new scope for the provision and organisation of imaging services. The situation in imaging is very similar to laboratory services. The technology allows a centralisation / decentralisation setup similar to that in laboratory services with distributed image acquisition sites in the region, centralised storage and interpretation of examinations, and immediate delivery of results at point of care.

Some activities that may have paved the way toward new organisational developments need to be mentioned. In spring 2000, *Finn-Medi Research* invited participants from the PHD, the UKK Institute¹⁴, VTT and the Tampere University of Technology to discuss how R&D collaboration in medical imaging could be improved between local actors. This discussion was driven by the R&D interests of the participants. In autumn 2000, a project report on this theme was published by *Docent Ulla Ruotsalainen from Tampere University of Technology and Leena Eskola, Managing Director of Atostek Ltd*¹⁵. One of the points made by the report was the missing involvement of users in research and development of medical imaging methods. The report proposed that the PHD could be a training ground for various techniques, but this did not appeal to the PHD's chief physicians in radiology, who were not interested in technological research and development.

Gradually, the PHD's corporate management realised that it would be only a short time before digital technology replaced analogue imaging services. In 2001, the Board of the PHD appointed a *working group* to make a proposal about how to proceed in reorganising medical imaging based on digital technology. Parallel to this, an initiative was made to develop "PACS for all" by Timo Koivula. The idea was to apply the DICOM standard to store the X-ray and all other digital images of all units in a single image archive. Eskola from Atostek Ltd was asked to join the project. According to her, this was mainly because "she was an outsider and hence the others were not opposed to

¹⁴ The UKK Institute for Health Promotion and Research conducts research into health-enhancing effects of living habits, health education and promotion and sports.

¹⁵ Atostek Ltd. provides software design and system design services for industry and public organisations. Medical imaging is part of its competence.

her". She started collecting data on the kinds of image materials produced by different units and how they stored them. Väinö Turjanmaa, the *chief physician of clinical physiology*, was very enthusiastic about the project's report, which was published in June 2002 because it opened new perspectives on digital imaging. This led to informal collaboration between Turjanmaa and Eskola.

The Government paved the way for reform with a resolution in 2003. According to this resolution, electronic patient record systems should be in use in the whole Finland by the end of 2007. It also stated that medical imaging services (and laboratory services) would be reorganised into independent profit centres owned by one or more hospital districts, and that the newest technology would be used.

When *Turjanmaa* was asked to join the working group appointed by the PHD in 2002, he suggested a fresh perspective on the planned reorganisation. Instead of conceptualising it as a reorganisation of radiologists' work, it should be perceived as part of a development process aiming at an electronic patient record. In addition to radiological services, this process should include also clinical physiology and clinical neurophysiology (both domains produce "images", i.e. graphs and curves). The working group also suggested that digitalisation should be based on municipal collaboration and that activities should be organised with the Laboratory Centre as a model.

From the beginning, the idea to move towards a regional imaging centre took the wind out of the radiologists' sails. They suspected corporate management of ulterior motives, and they were not motivated to take responsibility for the change. Instead, they were afraid of losing their positions due to the change. A service provider commented as follows:

"I hope the Imaging Centre will become a significant owner of instrumentation and that there will be a technique allowing calculation of service and product prices and investments. This could contribute to increasing customer interest, which is now missing. Decisions could be based not only on medical criteria, as they are now, but also on financial criteria. It is good that imaging activities will be organised into a profit centre."

Chief Physician Auvinen appointed Turjanmaa to be the coordinator for regional Imaging Centre in late 2002. Turjanmaa took the responsibility because he thought it would not be wise to permit external design of the change process. According to the strategic plan written by Turjanmaa in November 2002, the new independent profit centre would incorporate medical imaging, clinical physiology, and clinical neurophysiology. The profit centre would deliver medical imaging services to the hospital district and to the municipalities in the district, including the City of Tampere.

In order to operate efficiently and economically the organisation was to be customer and process centred. For the customer, the new regional centre would provide the possibility to obtain information on the closest imaging location and the prices of different locations. It would also make the imaging service faster than before.

To justify the creation of the Medical Imaging Centre, calculations were made that compare the present costs of medical imaging services with those of the proposed profit unit. The units included in the comparison were Tampere University Central Hospital, Valkeakoski Regional Hospital, the City of Tampere and two municipalities (Kangasala and Virrat). The calculations were made by *Johanna Lehtisalo, Kari Hakari at the City of Tampere and Lasse Kärki at Coxa*. The calculations showed that transition to the regional centre would not change imaging costs (Lehtisalo et al. 2004). However, according to the calculations, the profit unit approach will create benefits because only one RIS / PACS / external image archive is needed. The requirements relating to data security can be met more easily. According to Turjanmaa, an independent profit organisation also enables efficient integration with the other patient information systems for ordering examinations and for reporting results and communication of images to physicians. The cost of integration of the system to different municipal patient record systems, however, has not yet been calculated. The profit unit approach also enables centralisation of radiation protection services.

The hospital district management wanted to carry out this reorganisation more slowly than in case of the Laboratory Centre. The decision was made to start the regional Imaging Centre at the beginning of September 2004. The centre will initially incorporate only the imaging services of the hospital district. Municipalities will be given time to compare their imaging activities with those of the regional centre, assess the cost effectiveness of different solutions, and then decide whether they want their imaging services to be merged with the regional centre. Data on the real costs of running the Medical Imaging Centre in 2005 will be available in 2006. From then on municipal decisions to join the centre are expected.

Table 3. Similarities and differences in the core processes of laboratory and medical imaging services.

Unit	Core process
<i>Laboratory Centre</i>	<ol style="list-style-type: none"> 1. Ordering (Patient information systems - HL7 - Tamlab) 2. Collection of samples 3. Transport of samples (by car) 4. Automated analysis 5. Archival of results (Tamlab) 6. Reporting of results (web)
<i>Imaging Centre</i>	<ol style="list-style-type: none"> 1. Ordering of examinations (Patient information systems - HL7 - RIS) 2. Doing the examination (imaging) 3. Communication of images (PACS - Archive) 4. Reporting (Radiologist - workstation / RIS - PACS) 5. Archival (PACS - Archive) 6. Reporting of results (web)

The Laboratory Centre has served as an organisational model for the new Imaging Centre. However, there were critical differences that needed to be recognised. First of all, although the core processes of the Laboratory Centre and Imaging Centre are similar, they also differ in several respects (see Table 3).

The main difference is that in the case of the Laboratory Centre all analyses are done centrally whereas in the case of the Imaging Centre examinations are carried out at imaging units distributed throughout the region. To carry out the examinations, expert personnel (radiology technicians, nurses and radiologists) are needed. The question then becomes what imaging services are offered at the imaging sites, i.e. imaging technologies will be deployed at the imaging sites. Setting up the Imaging Centre requires investment in IT infrastructure that supports and enables the logistics of distribution and centralisation of services and integration with the EPR systems of the municipalities and the hospital district.

Another major difference between the two cases relates to co-operation with the City of Tampere. Tampere was, indeed, in favour of establishing the Laboratory Centre but presently the city is more sceptical about joining the regional Imaging Centre.

When the Imaging Centre started in September 2004 it has a staff of about 200 persons and its annual expenditure will be € 21 million. In the beginning, the Centre will incorporate the imaging units of TAUH, the Vammala and Valkeakoski Regional

Hospitals, the Mänttä Health Region and the imaging units of clinical physiology and clinical neurophysiology.

10.3 The Imaging Centre from the innovation point of view

The Imaging Centre started its operations in September 2004. Hence, its success cannot be discussed on the basis of concrete results. We can only use projections and plans to estimate what it might achieve. It seems clear, based on the cost comparisons, that major direct savings on imaging services will not be achieved and that these are not expected. The savings that can be achieved will depend on how the actual care processes change when imaging services and results are more quickly available and on how the patterns for the use of image services change.

The functioning of the Imaging Centre will depend very much on technology (imaging equipment) and especially on IT to create the RIS / PACS / long-term archive environment with integration to patient information systems. The question that needs to be answered soon is how it will deploy the regional health care information system (RHCN) as the integrating element in creating a district-wide EPR environment (In HUS, RHCN is used to facilitate reporting of imaging studies and image distribution to municipalities).

Parts of services offered by the Imaging Centre could be extended to all hospital districts and municipalities that are included in the special responsibility area of the PHD. Improved economies of scale would be achievable by extension of the reporting and archival services to this larger area. This, in fact, is what is also proposed in the National Health Project. Whether this will happen depends primarily on the will of the hospital districts and municipalities. It is not a technological question.

Finally, as the resolution of Government in 2003 as part of the National Health Project states that regional imaging centres should be created as independent profit units in all of Finland, these processes are already underway in many places. HUS and the Pohjois-Pohjanmaa Hospital District are the most advanced in this. In HUS, the public utility form of organisation started at the beginning of 2004. The question that remains to be solved, though, is how many such units are truly needed in Finland (the same applies to the laboratory centres).

Because these units operate as public utilities or profit centres they are to a large extent protected from real competition. Each serves its clients in a “protected”, geographically limited region.

11. The Findings

The previous chapters have described selected examples of systemic innovation in the Pirkanmaa Hospital District at the corporate and business unit levels (Figure 11).

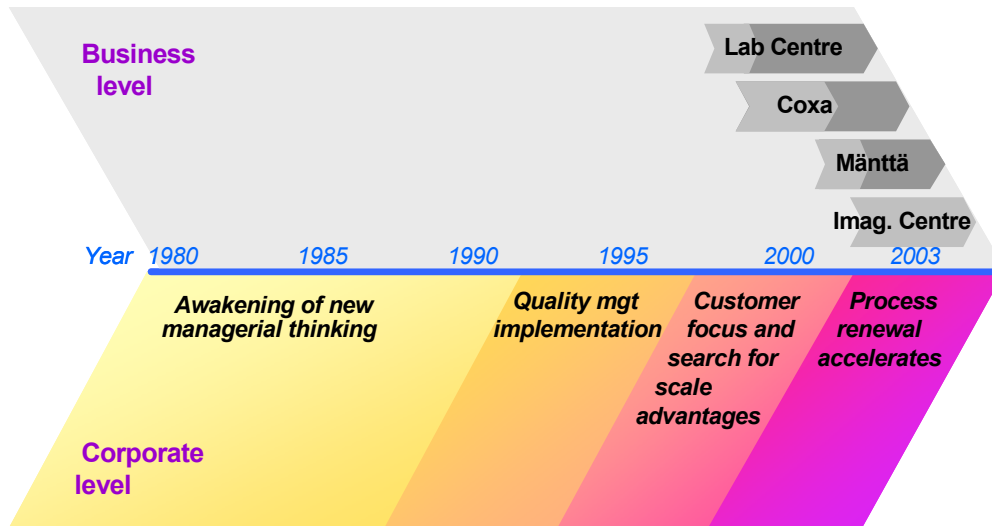


Figure 11. The two levels of systemic innovation in the PHD.

In this chapter, we examine these innovation processes in terms of knowledge-intensive service activities (KISA) and review the barriers to and carriers of systemic innovation in Pirkanmaa. However, before presenting the preliminary findings concerning KISA we need to provide a more extended description of the term KISA in health care and in this report.

11.1 About the KISA concept

KISA refers to both internally and externally provided service activities that are based on expertise (knowledge and / or acquired skills) and that are used to complement the core activities of an organisation. We distinguish between three types of KISA suppliers as follows:

- 1) business companies (KIBS)
- 2) public sector organisations
- 3) in-house service providers

As to the *externally* provided expert services, there is already an abundant research literature on knowledge-intensive business services, referred to as KIBS (Miles 2003, Toivonen 2002, 2001). These services typically include the software and new media

industry, marketing communications, financial services, legal services, technical services, management consultancy, personnel services and training services.

However, the private service companies are not the only external suppliers of KISA. Also, public sector organisations supply knowledge-intensive services. The public service providers are sometimes referred to as RTO, research and technology organisations. Universities, VTT and Stakes are typical examples.

'*Internal KISA*' is a more difficult concept to define in the health care sector. In the beginning of the study there was no definition or categorisation of what an internal KISA would cover in health care. There was no prior research on this topic that would have given an idea of what to expect. Our starting point was that the definition of an internal KISA was to be developed on the basis of this empirical case study.

However, it was clear from the beginning that although activities like diagnosis, treatment, and care of patients are knowledge-intensive and provided by experts, they do not fit the definition of KISA because they belong to the core activities of health service delivery. Instead, we are looking for internal expert service activities that *support* the core activities. In addition, the incremental, everyday development activities that people carry out in their clinical work were also excluded from KISA. In fact, one of the challenges was to distinguish between those health care experts (e.g. doctors or nurses) whose work would mostly relate to the core process from those who would make a major contribution to innovation in the core process, i.e. devote a considerable amount of their time to innovation-related activities apart from the "normal" clinical work. The latter were considered KISA actors.

On the basis of this categorisation, we can see that KISA can be bought from the market (from private or public providers) or generated by internal experts. Nevertheless, a fourth alternative can still be distinguished. We have called it '*network KISA*'. It refers to non-commercial activities where actors collectively develop their competence. In fact, networking on an ad-hoc and / or formal basis with colleagues both inside and outside an organisation is a typical way of working in expert organisations. Health care is a typical expert organisation where contacts with the outside world are an accepted norm and practice.

With KISA defined as above in the health care context, we will be looking for the kind of KISA that supports the innovativeness of health care service delivery. As already mentioned in the beginning of the report, the key questions that we focus on below are, (1) what kind of knowledge-intensive services were used in the PHD reform processes and (2) why, (3) how, and (4) when they were used.

11.2 KISA in the PHD's systemic innovation

11.2.1 KISA at corporate level

Figure 12 summarises the different KISA used in the PHD reform processes. It shows the key service providers in different stages. The different types of KISA providers are distinguished by different fonts.

Since the 1980s, in the awakening phase of business management, externally provided KISA for management training and education have had a major impact. The impulses of management consultants and university professors were considered crucial for the reform of the managerial style and philosophy.

In the early and mid 1990s, when Quality Management implementation started, external service providers (especially universities) played a critical role in offering quality management training. They also participated in development and implementation of the PHD quality system. However, another equally important factor was in-house KISA. Without the existence of persistent and committed internal champions, the implementation of the quality system would not have been possible. Another important aspect was the existence of enlightened and farsighted managers at the corporate level, who understood the importance of investing to this activity.

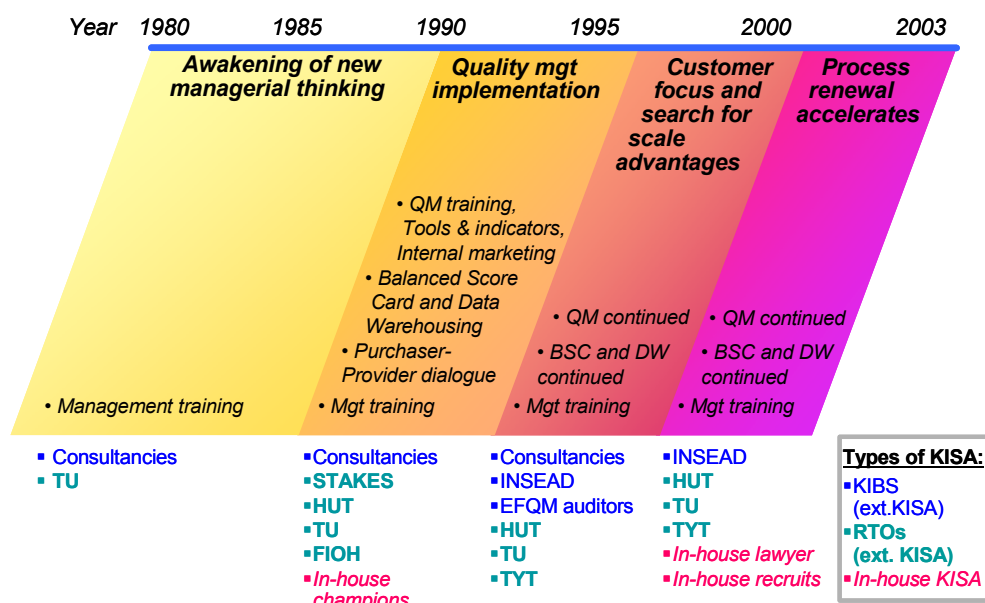


Figure 12. KISA actors involved in the PHD management reform process. (TU = Tampere University, HUT = Helsinki University of Technology, FIOH = Finnish Institute of Occupational Health, TYT = Tampere University, The Institute for Extension Studies, INSEAD = graduate business school in Fontainebleau)

In the late 1990s, in the phase of customer focus and search for scale advantage, the PHD's new corporate management expanded the extensive training and education programme for management and supervisors of the various profit units. This incorporated training in strategic, business, and quality management. The services were bought from universities, executive training institutes, and private consultants. Long-term collaboration in training service development has evolved especially with Tampere University. Also, the auditors in the EFQM award process played an important role in guiding further development of the quality system. Conscious development of in-house expert services was started.

In the present phase of accelerating process reform, the focus in the use of KISA continues to be in the development of in-house expertise. This is illustrated by recruiting personnel for full-time positions in development, training, and customer service. The use of external KISA is basically confined to the training and education services. These activities continue to be extensive.

Parallel to these, network-KISA has had a major influence throughout the reform process since the early 1980s. The PHD is a partner in a number of national development projects and programs where ideas are exchanged, discussed, and refined. National and international expert meetings, conferences etc. also provide an environment where ideas are exchanged. Health care in general is quite perceptive and “curious” of new trends. New ideas are always being sought, especially those that have been shown to work. However, as mentioned before, health care is also rather change-averse. In that respect the PHD has shown exceptional initiative in embracing new ideas and applying them in its structures and management.

11.2.2 KISA at business level

Here, we summarise KISA in the innovation process of each business unit separately. Figures 13a through 13d illustrate the type of KISA used in the development and implementation phases in each case. To distinguish between different types of KISA, see explanation box in Figure 12.

KISA in the Laboratory Centre

As figure 13a indicates, the KISA used in the development of the Laboratory Centre have been mainly provided by in-house experts, as part time work. The Laboratory Centre's Managing Director was one of the in-house experts who made studies relating to pricing of laboratory services. This provided quantitative arguments for the reform in the preliminary stages of the process as well as afterwards. Few external expert services were used; among them were those provided by the simulation company and data processing experts.

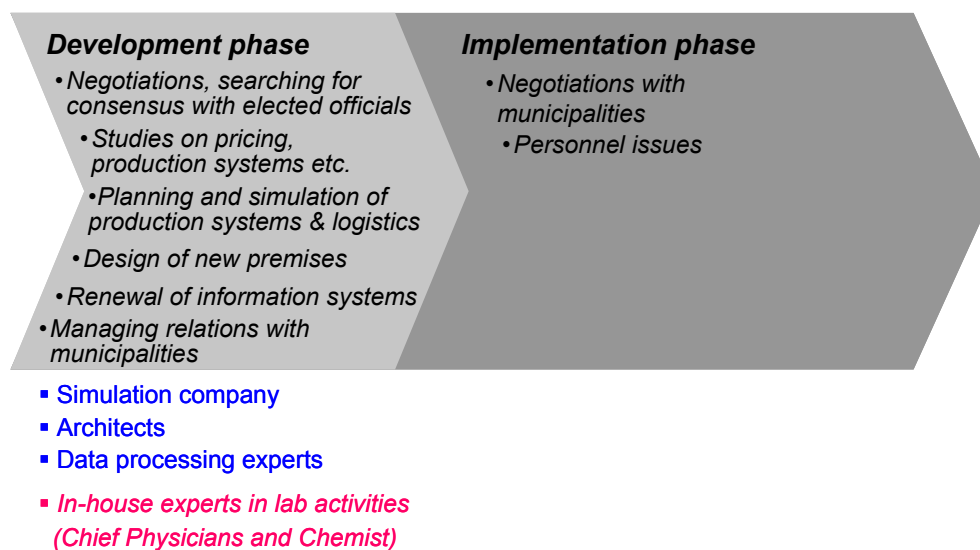


Figure 13a. KISA used in the Laboratory Centre development and implementation processes.

KISA in the Coxa Hospital

Figure 13b shows that in the early development phase of the Coxa hospital, external KISA actors played critical roles. The study of the National Agency for Medicines opened the window of opportunity for the PHD to start developing their endoprosthesis surgery services. The agency also acted as a spokesman for developing systemic innovation that would provide a higher quality. Finn-Medi Research Ltd - as a neutral regional player - was commissioned to carry out a preliminary study on the possibilities of organisational reform.

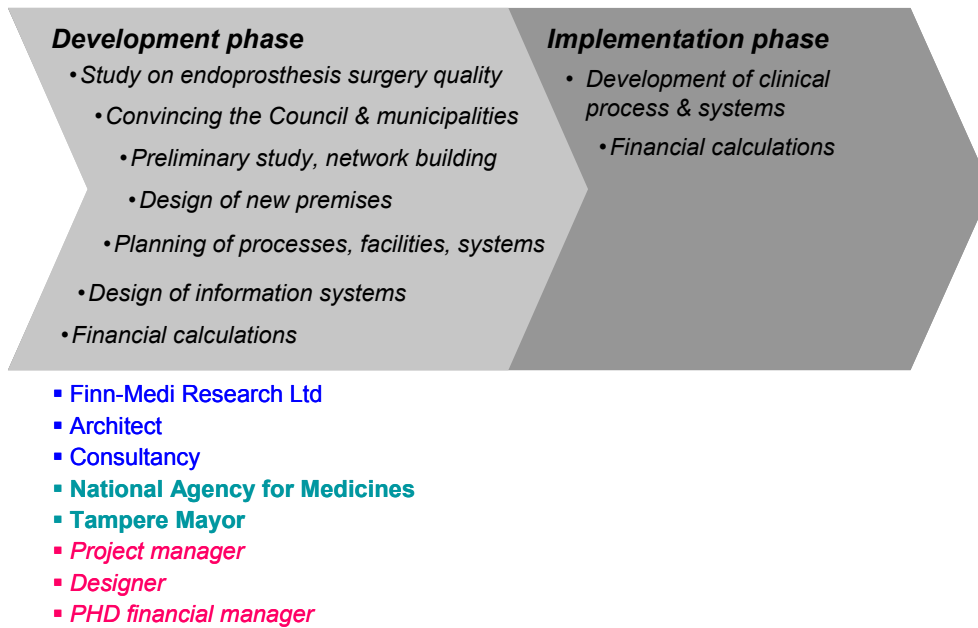


Figure 13b. KISA used in the Coxa Hospital development and implementation processes.

In the implementation phase, the focus was transferred to in-house expertise. An orthopaedist who had formerly been employed by the PHD was recruited to manage the process. Together with an in-house financial expert, and the support of the PHD corporate management and staff, he managed the process without much external support.

KISA in the Mänttä Health Region

External expert services also played a key role in the early development stage of the Mänttä Health Region case. The PHD management commissioned Stakes to study the prospects for reorganising the regional health service delivery (Figure 13c). The study prepared ground for implementation.

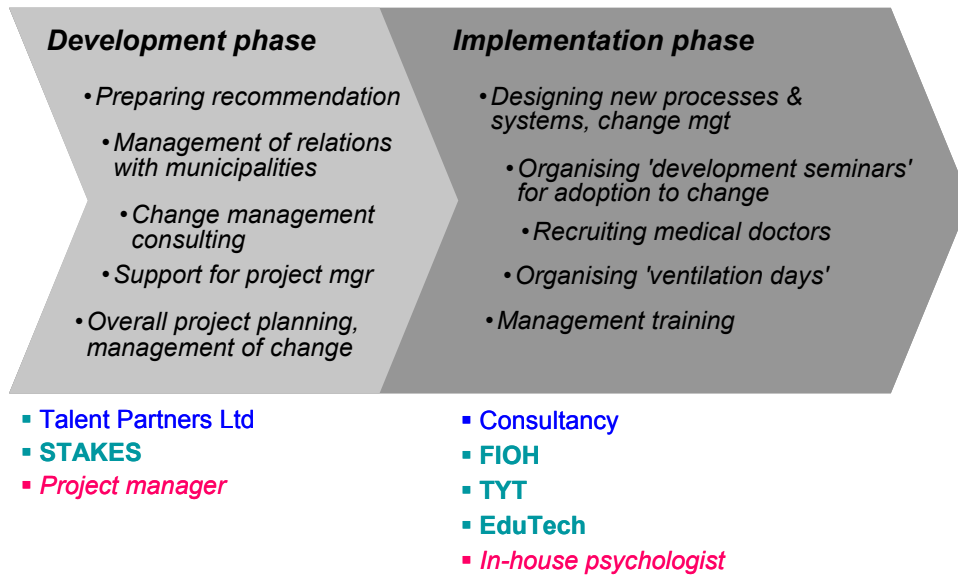


Figure 13c. KISA used in the Mänttä Health Region development and implementation processes.

From then on focus was transferred to utilising in-house expertise. The project manager was recruited from within. With the support of corporate management she managed the change process. However, unlike the unit managers in previous cases, she used the services of a consulting company in managing the change. To ease the tensions within personnel, external and internal psychologists' services were used.

KISA in the Imaging Centre



Figure 13d. KISA used in the Imaging Centre development processes.

In the case of the Imaging Centre, as in the previous cases, one of the crucial actors for innovation was the project manager (Figure 13d). Although some external expert services were used in the development phase, most KISA was internal.

11.3 Overview of the role of KISA in systemic innovation in the PHD

An overall examination of the case study shows first of all that the general standpoint of the PHD corporate management has been supportive to building and using in-house competence. This preference was actually presented as the strategic choice of management. The arguments favouring in-house KISA are based first on the fact that an organisation of the size and type of the PHD inherently has a lot of knowledge and competence in its personnel, who are highly interested in further developing their competence (“curiosity driven professional organisation”). Second, it is felt that the changes that have been undertaken are so demanding and of such a long duration that the expertise for change management and implementation of new ideas needed to be cultivated in-house.

Additionally, the study indicates that externally provided management training and education services have played a critical role in the overall systemic innovation, especially in its initial starting phases. Initially, the external training service providers transferred ideas, conceptual tools and mental structures from the business world to the hospital district, but later on more and more business management services that have been designed to health care use have been available and used. The providers of these services have been both consulting businesses and universities. There has been no preference between private or public training services.

A third factor has been network-KISA. Networks have served as a means to access new ideas and also as a means to evaluate them. As an example, the idea for the purchaser-provider management system originates from the UK but it underwent a number of modifications before actual implementation in the PHD.

The choice between internal and external expert services has involved striking a balance between different pros and cons. Table 4 shows the different points of view that were mentioned by the interviewees.

The systemic innovation processes of the new business units were carried out as part of the PHD strategy. In that sense, the processes can be characterised as top-down. However, the triggering events and some of the early activities cannot be characterised as top-down. What has been clear, though, is that corporate management has in all cases openly sought dialogue and searched for consensus. The managing

directors of the business units have played a key role and their work has been complemented and supported by the PHD corporate management and staff.

External KISA were typically related to early development stages of the systemic innovations on business unit level. Expert services have been acquired in order to gain preliminary information, insight, and well prepared recommendations. Sometimes these services were performed independently by a public organisation and sometimes they were commissioned by the PHD's corporate management. An example of the former situation was provided by Coxa case. The National Agency for Medicines (RTO) conducted a revealing study on the quality of endoprosthesis surgeries and took part in promoting a new kind of public private partnership in reorganising endoprosthesis surgeries. Examples of the latter were provided by the Mänttä and Coxa cases where the PHD's corporate management commissioned studies on the prospects for reorganisation. In the Mänttä case, the study was conducted by Stakes (RTO) and in the Coxa case by Finn-Medi Research (KIBS). The PHD corporate management was of the opinion that studies made by an outside (rather than the hospital district), objective actor would be more favourably received by the municipalities.

Table 4. Aspects related to the choice between external and internal KISA.

Acquisition of external expert services	Building and use of in-house expert services
Accumulation of learning within the organisation hindered.	Learning accumulates in the organisation.
Flexible to use, no need to maintain continuously. Costs less, innovation development costs shared with other users.	Expensive to build and maintain. No other organisations share innovation development costs.
The personnel of the customer organisation can concentrate on core tasks.	If internal experts work part-time for innovation, there will be less time for primary work.
Leads to more general solutions.	Leads to tailor-made solutions.
Easier integration of systems between different organisations.	Difficult integration of systems between different organisations.
Arguments based on external, neutral actors' studies are often easier to accept.	Neutrality of views can be questioned from the outside.

In all cases, mostly in-house resources were used for implementation. One obvious reason is offered by the fact that the PHD was the pioneer in this kind of systemic innovation, so there were still not many experts available for such organisational change processes with enough insight and understanding of the complex relations between actors and stakeholders of a health care organisation, such as the PHD. In the Mänttä case, some external change management services were, however, acquired to facilitate the management process and to ease the tension among personnel.

12. Discussion

In this chapter, we will first discuss the carriers of and barriers to systemic innovation in specialised health care. Second, we will raise some questions relating to the role of KISA in enhancing systemic innovation.

12.1 Carriers of and barriers to systemic innovation

Health care systems in most industrialised countries face major change pressures. On the one hand, the rapid *ageing, the changing life styles and expectations of the population* increase the demand for health care services. Simultaneously, there is political debate on the *limits of public funding* for health care. On the other hand, continuous *progress in medicine, life sciences and technology* enables new diagnostic and therapeutic cares and diagnosis and treatment of illnesses that could not be treated before. As a result, the scope of health care is continuously expanding. This also leads to increased demand for services. The resulting challenge is how to meet the demand while containing costs, in other words how to provide more high quality services without raising costs. The “only way out” of this dilemma is systemic innovation. All elements making up the health system need to be analysed critically, especially the production of health services i.e. processes, resources, skills / education, technology, organisation, and management.

In this section, we will discuss the carriers of and barriers to systemic innovation revealed by this case study. The carriers identified can be divided into those related to the regional environment and those related to managerial work. Finally, we will raise some challenges that are typically met when developing systemic innovations in health care.

12.1.1 Foundation provided by the regional environment

The Pirkanmaa Hospital District is generally viewed as a pioneer in systemic innovation within specialised health care in Finland. There are some specific historical and cultural factors in Pirkanmaa that may partly explain the ability to form innovative partnerships.

First of all, the *regional ethos and political environment* have supported innovative collaboration. There is a long tradition of innovation in the region starting with the establishment of the two universities in the 1960s, the medical faculty in the 1970s, and the technology parks (Hermia and Finn-Medi) in the 1980s. A key actor in all these has been the City of Tampere. Another aspect is the relations of the PHD with its owners,

the municipalities, because ultimately all proposed changes in the PHD have to be approved by them. It seems that in the PHD case, due attention was paid to the relations on both sides, enabling a dialogue for mutually acceptable solutions.

Secondly, the innovativeness of the PHD has been enhanced by the *networks of competence* that have been linked to the hospital. The Finn-Medi Technology Park, for instance, is a pool of expertise in health care and biotechnology and it operates in education, research, health care, and business. Additional important actors in the network have also been the medical and other faculties of Tampere University and Tampere University of Technology.

Thirdly, the *alignment of the needs of a university level teaching hospital with those of a hospital district providing specialised health services to its municipalities and their citizens* is not always easy to accomplish. Comparison with the other four hospital districts with university hospitals suggests that the PHD has been more responsive to emerging needs, and more successful in aligning itself according to them.

The relative "youth" and less stable position of the Medical Faculty of Tampere University¹⁶ may have increased its capability and willingness to engage in collaboration with the hospital district. A contributing factor has also been the "orientation" of the medical faculty towards public health, not so much specialised medicine.

12.1.2 Managerial contribution

In the Pirkanmaa case, management style and practices played an important role in facilitating systemic innovations. Several aspects need to be highlighted.

One of the carriers of systemic innovation relates, no doubt, to the success in first formulating and then implementing corporate strategy. Strategy has not remained on paper. Instead, the PHD management has been able to discuss with its important stakeholders, i.e. the owner municipalities and the PHD Board and Council, the kinds of innovations that they want to co-create. By generating win-win situations, they have gained the commitment of all key actors. Parallel to this dialogue, the investments in first quality management and later in the BSC approach have enabled inclusion of all personnel in the co-creation process. The management has created and sustained a

¹⁶ The medical faculty was started only about 30 years ago and throughout its life it has been under various threats, including a threat of closure. The reason for this was that estimates for the number of physicians needed in health care in Finland at one time suggested that the total intake of students to medical faculties should be considerably reduced. These estimates, however, proved to be wrong.

dialogue across many people and organisations with diverse perspectives. *Creating strategic conversation* both within the organisation and with other stakeholders about current challenges and future opportunities has been indicated in management literature (Liedka & Rosenblum 1996) as one of the key competences of successful companies and it also seems to be one of the PHD corporate management's strengths.

Secondly, the PHD corporate management has been open-minded. It has been *ready to make experiments* even though the results were uncertain. Thirdly, it has had the patience to maintain a dialogue to *find consensus to back up the efforts*. And fourthly, the corporate management has had the ability to *recruit tenacious and skilful managers* for the newly established units. Innovation calls for managerial champions.

Additionally, the study indicated that investments in quality management (e.g. extensive education, and training programs complemented by quality improvement projects) provided a good foundation for further systemic innovation. Quality management initiatives do not necessarily, however, result in desired outcomes in health care even when senior leadership is involved and even if a series of well planned activities is implemented. It has been pointed out that one of the key issues is the ability to make the programs be viewed as part of "professional" agenda rather than "management" agenda (Striem et al. 2003). For this reason, it is important that *key professionals actively lead the programme*. Then the programme will have credibility and a chance of success. In the case studied, management was aware of this perspective. For this reason, they intentionally pursued the commitment of chief physicians from different clinics to act as champions for the process.

Managing change is not easy because change often influences established power balances. For instance, quality management can appear as a threat as it requires changes in how health care professionals and management relate to patients and co-workers. By requiring measurement and by rendering professionals' performance more visible and controllable, quality management systems tend to reduce the power and autonomy of professionals (Striem et al. 2003). The core clinical competences have grown over time as an accumulation of activities and decisions that focus on one kind of knowledge - at the expense of others. This is why Leonard (1998) argues that an organisation's core capabilities easily become its core rigidities. She says that "once a system is set up to deliver a certain capability, the system acquires a momentum of its own and becomes difficult to dismantle even if it is now outmoded". Several mechanisms interactively tend to maintain the existing core capabilities. They relate to economics, politics of power, and behaviour. In the Pirkanmaa case, it was interesting to note that in quality improvement projects special attention is paid to "weeding out" existing practices before replacing them with the ones developed in the project.

12.1.3 Challenges of systemic innovation

Innovation literature provides insight to the challenges that are met when inducing systemic innovations. The notion of "technological regime" (Kemp 1994) has been introduced. Technological regime can be defined as the whole complex of user practices, scientific knowledge, symbolic meanings of technology and services, service characteristics, skills and procedures, infrastructure, organisational structures, and policy. Systemic innovation typically challenges the technological regime and requires changes in many spheres. This explains their slow diffusion and the fact that they often remain on the shelf. Various approaches have been developed for adding momentum to introduction and diffusion of systemic innovation (Kivisaari et al. 1999, 2004; Kemp et al. 2001; Weber et al. 1999). They are characterised by activating and sustaining a dialogue among the actors who set conditions for the development and diffusion of the innovation.

In this report our intention is not, however, to go deeper into this general framework. Instead, we highlight the specific challenges that were manifested in the Pirkanmaa case study.

Some of the challenges of systemic innovation related especially to the creation of the new business units through outsourcing and reorganising responsibilities and activities. First of all, it is important to make sure that the newly formed unit *continuously meets the needs of the customers* and maintains their trust in its capability to serve them well. It must meet the customers' requirements in service delivery so well that they do not feel the need to produce the services by themselves. Professional organisations, namely, have a tendency to "regrow" functions that they initially outsourced. If the incentives are not stated clearly enough it may seem more economical to carry out certain services inside a profit centre than purchasing them from outside. This results in a double organisation and reduces overall efficiency. This is a generally known problem related to managing corporations through profit centres. However, the problem is aggravated in public organisations because their cost awareness is not so good and costing of own work is not based on all additional and overhead costs.

The Laboratory Centre serves as an example. Through its centralised analysis facility, it can create greater economies of scale than the decentralised model. But at the same time it is removed from points of care (POC) and cannot provide laboratory services as quickly as modern POC-instruments can. A balance has to be struck between the needs and the possibilities offered by technology and centralisation and continuously maintained.

Another challenge related to outsourcing is *choosing the most suitable organisational form*. The choice between a limited company and public utility has important implications in terms of competition and other aspects. For instance, claims have been presented in a public debate that the Laboratory Centre, as public utility, operates in an overly sheltered environment (eg. Pekkarinen 2000; Miettinen et al. 2000). It can always count on its owner, the PHD, to act as its major customer. Privately owned laboratories can, therefore, not compete with it on level ground. Similarly the limited company form has potential problems. For instance the business idea of the Coxa Hospital is also to get contracts from outside the PDH, especially from other hospital districts. The question whether the current incentive environment encourages other hospital districts to purchase hip replacement surgeries from outside or is more geared to support the current practice of carrying out the surgeries within the hospital district.

Today, in health care organisations, it is difficult or even impossible to get quantitative, including financial data on how the processes function: e.g. what are the processes that produce the services (process modelling), what kind of resources they require and consume (process quality), and what outcomes are produced. The lack of objective indicators of efficiency and efficacy is the main issue hampering development of health services. There are data on outcomes based on disease classifications, usage of in-patient and out-patient facilities, and number of procedures performed at profit centre level. However, there is very little data on how the resources are used in different patient / illness segments and what results are produced. The methods used in service and manufacturing industries to determine where resources are needed for optimal performance are slowly, but too slowly, finding their way in health care.

Management needs *objective, quantitative data to justify the need for change to elected officials and municipalities*. This is critical, because without being authorized by decision-making bodies, management cannot start implementing change. In the PHD case, corporate management has been able to acquire the needed financial data to back up its change arguments. These were provided by in-house experts (in the case of the Laboratory and Imaging Centres and Coxa) and by outside experts (in the case of Mänttä and initially Coxa).

Another, related aspect is the *difficulty of quantifying economic gains of reorganisation*. This is because, today, health care still lacks objective quantitative indicators that could be used to measure performance, efficiency and effectiveness. More qualitative descriptions of the (intended or unintended) consequences of reforms would also be important because they could be used for improving change management competences. Gaining this kind of insight would, however, call for follow-up studies and process evaluations carried out by neutral outsiders.

And, yet, another barrier to reform relates to the fact that *doctors and managers have different approaches to issues such as accountability, use of guidelines, and finance*; these differences are based on their professional education and training, beliefs, and experiences. For clinicians the core events are the clinical encounters. When they make decisions on what constitutes best practice they also make decision about the organisation of health care and when they apply the best practice decisions in patient encounters they also allocate and spend the health budget. Reform initiatives to address these concerns are typically either top-down and/or moral persuasion. Degeling (et al. 2003) argue that this kind of approaches to the implementation of health reform lead to a "dance macabre" where clinicians do not participate in the reform. These approaches undermine opportunities to incorporate the perspectives of clinician in local reform strategies and thereby prevent the revival of "responsible autonomy" as an organising principle in health care. As a result, all parties will continue to be driven by distrust and the related crises of confidence that pervade the field.

Systemic innovation is a demanding and slow process. On the basis of their study on management of systemic transformation in health care, Christensen et al. (2000) argue that health care is an extremely change-averse industry. They urge government and health care industry leaders to step forward to help insurers, regulators, health care organisations, and health professionals to work together to facilitate systemic transformation. It is a challenge for inter-organisational collaboration. Some hope for meeting this challenge is given by studies reporting emergence of a new paradigm (Kanter 1999, Wood & Hamel 2002): partnerships between private enterprises and public interest to produce profitable and sustainable change for both parties. According to these studies, leading companies are beginning to find inspiration in social sector. This issue brings us to the final theme of discussion: the role of KISA in health care innovation and the challenge of inter-organisational collaboration.

12.2 The role of KISA in health care innovation

The case study revealed an issue that is typically not consciously assessed in organisations or in political decision making: what is actually the 'right' mix of external and internal KISA in an organisation. The advantages and disadvantages related to the use of external services and to building in-house competence depend on the point of view that is taken. In the following, we discuss them from two relevant points of view: organisational learning and innovation diffusion.

12.2.1 KISA from organisational learning aspect

There is an abundant literature that focuses on building and sustaining innovation within an organisation. Leonard (1998) proposes that there are essentially four kinds of learning activities which create, channel and control the knowledge necessary for an organisation's current and future operations. The first three activities mentioned are focused internally and the fourth externally focused:

- Shared, creative problem solving (to produce current services).
- Implementing and integrating new methodologies and tools (to enhance internal operations).
- Formal and informal experimentation (to build future capabilities).
- Pulling expertise from outside.

This case study looked into the PHD's activities from all four perspectives. It indicated that hospital districts are large organisations with lots of horizontal boundaries and hierarchical levels which do not provide a fruitful basis for shared, creative problem solving on the level of the whole organisation. However, in the PHD case, corporate management has been successful in involving the personnel at all levels of the hierarchy and the important stakeholders in the strategy formulation and implementation processes. The initial implementation of and continued investments in the quality system and after that the development and use of the BSC system have been excellent tools to engage the personnel with the strategy processes. Similarly, the purchaser - provider dialogue system has served as a tool for engaging the municipalities and their primary health care centres into a dialogue. Lastly, the MIS serves as a management tool on a daily basis and as a means to maintain the dialogue with the municipalities. The four cases of systemic innovation illustrated the PHD's activities in experimentation for building future capabilities. As to external organisations, the case study indicated that the PHD, unlike other Finnish hospital districts, is very actively involved in benchmarking its activities and in developing ideas with the external world. Moreover, management training and education services had been purchased extensively from outside to bring in fresh perspectives and know-how.

If we take the organisational learning point of view to finding the right mix of internal and external expert services to support health care innovation capability, developing and using internal expertise seem to offer some indisputable advantages. Firstly, the new knowledge and competence generated is accumulated within the organisation itself. Secondly, the use of in-house expertise offers possibilities for developing tailor-made solutions to organisation's problems. After all, internal experts often have intimate knowledge relating to the development challenges.

But there are also disadvantages related to utilisation of in-house services. Firstly, building and maintaining wide spread competence is expensive. Secondly, if internal specialists are involved in support service activities, their work contribution is lacking from the core activities.

An additional aspect is related to the need for neutrality. Systemic innovation is inherently a political process; it calls for reaching consensus among multiple actors. The neutrality of background information will often become a critical issue and this may give reasons for utilisation of external services. And indeed, in the PHD, external expertise was typically used in the early stages of systemic innovation.

In the PHD, implementation of systemic innovation tended to be based on in-house expertise. In our concluding joint discussion with the interviewees, however, some expressed views that also favour the use of external experts to support implementation. Some proponents stressed that if external process consultants are used at the start they should maintain their role as 'midwives' throughout the process. Other proponents pointed out the importance of developing the field of follow-up and assessment studies. The use of external experts in major reorganisation processes would enable intermediate analyses and assessment of advantages and disadvantages in different situations. Assessment of change processes would bring descriptive and qualitative data to complement the comparative qualitative data provided by the present benchmarking activities. They would enhance organisational learning. At the same time, care must be exercised that the actual change process stays in the hands of the organisation itself and is not managed by outside consultants or experts.

The participants also thought that (in Finland, at least) assessment is presently often carried out as a 'ritual', as if its purpose were to bring the process to a legitimate end. When conducted in this way it does not serve the interests of organisational development and learning. Instead, assessment should be the beginning of something new. It should assess the present situation and give direction for further development and innovation.

An interesting question was raised by one of the interviewees in the meeting. He claimed that there is a dilemma that is related to KISA use when comparing organisations with external and internal focus. An organisation that perceives itself as a part of a larger system is better able to use external services, but is less dependent on their use. On the other hand, an organisation with internal focus is less able to use external expert services, but it might particularly benefit from their use. In other words, those who are doing well are better positioned to meet the challenges of the future. The above view raised some interesting questions. Would the PHD be capable in the future of using external services more extensively now that it has developed its competence

and ability to relate to the larger environment? And from a different point of view, would the PHD be interested in engaging in the transfer of its “learning” to other interested health care organisations?

12.2.2 KISA in diffusion of systemic innovation

Recent management literature has argued that the problem is not so much that managers would not know what needs to be done to improve an organisation's performance but rather that implementation is the challenge. This situation is referred to as the knowing-doing gap (Pfeffer & Sutton 1999). As regards health care, it has always been quick to adopt new medical and technological innovations, but in terms of systemic or process innovation it can be described as a particularly rigid sector (Christiansen et al. 2000; den Hertog & Weehuizen 2004; Adler et al. 2003). In the following, we will discuss the role of internal and external expert service providers in facilitating the diffusion of systemic innovation in health care.

From the perspective of innovation diffusion, the critical role of external service providers is apparent. When external service providers are involved in systemic innovation processes, new knowledge and insight accumulates within those organisations. A great deal of this new knowledge is generic, although some of it is always case-specific. The accumulated generic knowledge can be transferred to other health care organisations to facilitate their change processes. The external service providers can develop their business ideas and skills on the basis of their accumulating insight into the dynamics of health care. The availability of high quality expert services to support change management would offer certain advantages to health care organisations as customers. Firstly, it would free them from the necessity to develop and maintain a very wide variety of competence themselves. Secondly, their development costs would be decreased.

However, the reverse side of the issue also needs to be dealt with. The service products would not be totally tailor-made but based instead on standard elements. The desired degree of standardisation of solutions is a relevant issue, for instance, in the case of development of new information systems. In Finnish health care it is typical that service organisations develop or purchase information systems that are tailored to their specific needs. The customer is willing to bear the higher expenses of development and maintenance. If, instead, customers would collaboratively strive towards placing somewhat more standardised orders, they could reduce development and maintenance costs. From the external service providers' point of view, developing tailor-made solutions is one way of doing business and the customer, of course, pays the bill. The Finnish health care software industry is today oriented towards this mode of operation.

Changing it into a product-oriented business environment would require a major reorientation at the customer side.

Health care specialists often state that health care is such an exceptional sector that solutions from the business sector do not apply. Regulations, high educational level of professionals, the lack of operational transparency, and the fact that the demand for health services is always greater than their supply are often mentioned among the features that make the fit of business sector solutions poor. On the other hand, most of the management strategies used in health care originate from the business world, like profit units, process management, and BSC.

But it is also true that solutions which are developed in one region are not easily transferred to another. The challenge to the Finnish health care is to decide whether these ideas will find their way into other organisations and regions. The other alternatives are, firstly, that no one will use them, and secondly, that the others will only use the idea and do the implementation locally by building their own competence and skill base. This would result in “reinventing the wheel” several times over without making use of the lessons of the previous implementations. Given the highly distributed governance model of the Finnish health care system and the current incentives of the system, it is highly likely that this latter alternative will be realised.

The study indicated that currently ideas and experiences are freely exchanged in conferences and other meetings between health care organisations, but that no single organisation has the position, interest, or incentive to promote similar change processes in other organisations. Should the 'promoter' be an external and neutral actor? One possibility might be a partnership of the external neutral actor and the original innovator for promotion of knowledge transfer. The innovator would probably benefit from being involved in the knowledge transfer process. After all, it has been argued that mastering something comes from the combination of doing it yourself and teaching others to do it (Pfeffer & Sutton 1999). According to the interviews, Pirkanmaa receives a lot of invitations to speak on their systemic innovations and also makes quite a lot of site visits. However, these findings only reinforce the earlier statement that health care organisations are curious about new ideas, but resist their implementation.

In conclusion, service providers naturally need to take full responsibility for managing their systemic innovation processes, finding the needed resources, and developing the required skills. The question is what kind of expert services are needed for supporting these innovation processes and what services should be provided internally and what externally. Currently, there are few competent knowledge-intensive service providers that have insight into the organisational complexity and dynamics of health care. There seems to be a consensus on the need to strengthen the market for high quality expert

services for health care sector in order to enhance organisational learning and diffusion of systemic innovation. Those services could include

- development of measures and indicators for justification of reform and for assessment of its progress and results.
- process analysis
- process modelling and reorganisation
- development of technological systems to support new processes.

The KISA actors' insight improves with experience. Developing the market calls for long-term collaboration between customers and external service providers. In the long run, both health care organisations and KISA actors will benefit from collaboration. KISA actors' qualifications increase and the emerging market for high-quality service will benefit health care organisations. Building long-term innovative partnerships starts from preparing a clear business agenda, commitment of both partners to change, and investment by both parties.

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Liite A: The interviewees

Ossi Auvinen, Chief Physician of the PHD. Feb. 11th 2004.

Leena Eskola, Managing Director, Atostek Ltd. April 7th, 2004.

Matti Eskola, Managing Director of Finn-Medi Research Ltd. May 28th, 2003.

Jaakko Herrala, Administrative Chief Physician of the PHD. April 21st, 2004

Rauno Ihalainen, CEO of the PHD. Jan 1st, 2004.

Jouko Isolauri, Ministerial Advisor, Ministry of Social Affairs and Health. May 26th, 2004.

Raimo Jämsén, Special Advisor, Ministry of Social Affairs and Health. April 22nd, 2004.

Timo Koivula, Chief Physician, the PHD. April 7th, 2004.

Liisa Korkka, Planner, the PHD. April 21st, 2004.

Juha Kostiainen, Managing Director of Finn-Medi Research Ltd in 1995–1997 and Director, Business Development, City of Tampere in 1997–2001. April 23rd, 2004.

Hilkka Lamminsivu, Information Service Manager, the PHD. May 28th, 2004.

Juhani Lehto, Professor in Social and Health Policy, Tampere University. May 28th, 2004.

Matti Lehto, Managing Director, Coxa Hospital. March 18th, 2004.

Ari Miettinen, Managing Director of Laboratory Centre, Feb 16th, 2004.

Kaija Nojonen, Sectoral Director of the PHD, Jan. 15th, 2004.

Markku Pekurinen, Research Professor. National Research and Development Centre for Welfare and Health. April 22nd, 2004.

Päivi Sillanaukee, Managing Director of Mänttä Health Region. Feb 26th, 2004.

Turkka Tunturi, Administrative Chief Physician of the PHD in 1988–2003. Chief Physician of Varsinais-Suomi Hospital District. April 26th, 2004.

Väinö Turjanmaa, Managing Director of Medical Imaging Centre. Feb 26th, 2004.

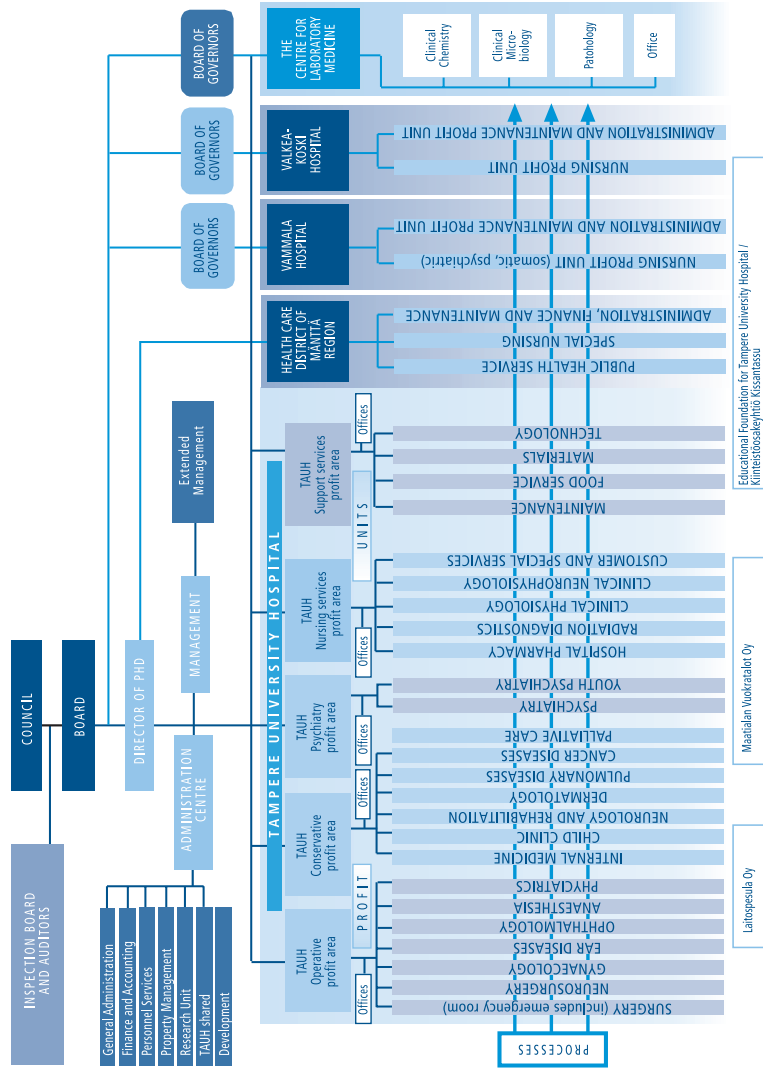
Timo Valli, Chief Information Officer, the PHD. April 23rd, 2004.

Kari Vinni, Director of Research and Development, Ministry of Social Affairs and Health. May 24th, 2004.

Appendix B: PHD organisation chart 2003

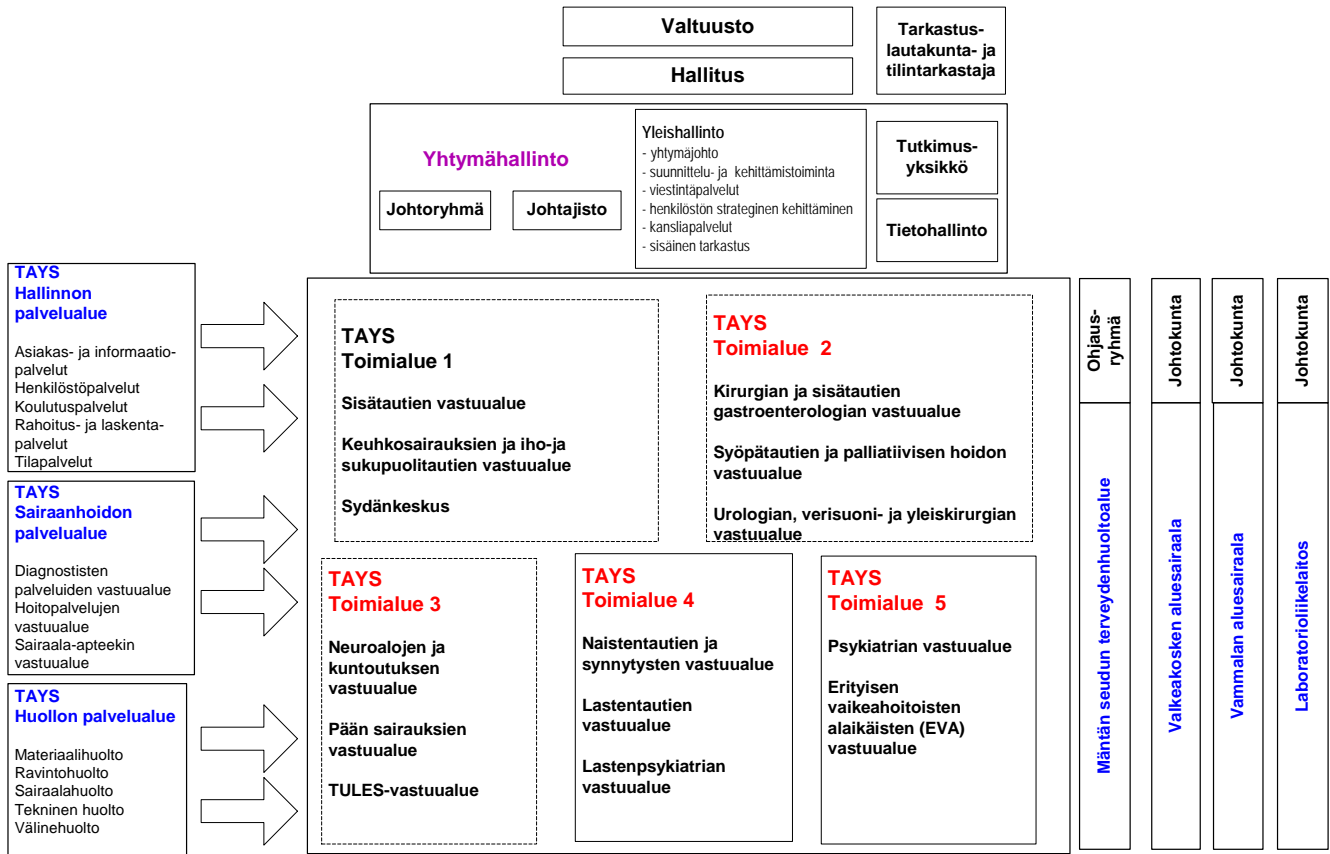
PIRKANMAA HOSPITAL DISTRICT

Organisation 2003



Appendix C: PHD organisation chart 2004

(only available in Finnish)



Author(s) Kivisaari, Sirkku, Saranummi, Niilo & Väyrynen, Erja			
Title Knowledge-intensive service activities in health care innovation Case Pirkanmaa			
Abstract The report sheds light to the role of knowledge-intensive service activities (KISA) in developing the innovation capability of health care system. It is based on a case study in the Pirkanmaa Hospital District. The PHD which has generally been considered a pioneer in systemic innovation within specialised health care in Finland. Systemic innovation refers to simultaneous redefining of boundaries of service provider organisations boundaries, development of new kinds of services, and application of new technologies. Of the several systemic innovations with the PHD four have been selected for this study: The Laboratory Centre, the Coxa Hospital, the Mänttä Health District and the Imaging Centre. The study indicated that systemic innovation in the PHD has been mainly developed and implemented by internal KISA. However, external consultancy services have been used to some extent in the early preparatory phases. Additionally, external training and education services have been extensively used at all times. The report discusses incentives and barriers for change as well as the relation of internal and external KISA to organisational learning and knowledge transfer.			
Keywords knowledge-intensive service activities, systemic innovations, health care			
Activity unit VTT Technology Studies, Kemistintie 3, P.O.Box 1002, FIN-02044 VTT, Finland			
ISBN 951-38-6505-3 (soft back ed.) 951-38-6506-1 (URL: http://www.vtt.fi/inf/pdf/)			Project number P3SU00181
Date November 2004	Language English	Pages 104 p. + app. 4 p.	Price C
Name of project KISA HC		Commissioned by National Technology Agency of Finland Tekes	
Series title and ISSN VTT Tiedotteita – Research Notes 1235-0605 (soft back edition) 1455-0865 (URL: http://www.vtt.fi/inf/pdf/)		Sold by VTT Information Service P.O.Box 2000, FIN-02044 VTT, Finland Phone internat. +358 9 456 4404 Fax +358 9 456 4374	

The report provides insight in the role of knowledge-intensive service activities (KISA) in enhancing the innovation capability of Finnish health care. It explores KISA in systemic innovation processes. The report indicates incentives for systemic innovation in terms of regional environment and managerial style and reveals challenges related to health care reform. The advantages and disadvantages of the use of internal and external expert services are discussed from two points of view: organisational learning and diffusion of innovation. The report suggests that market for external expert services be strengthened.

Tätä julkaisua myy
VTT TIETOPALVELU
PL 2000
02044 VTT
Puh. (09) 456 4404
Faksi (09) 456 4374

Denna publikation säljs av
VTT INFORMATIONSTJÄNST
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