Network-based health care *in practice*

The ExDin project

Executive summary
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Preface

Leading Health Care Foundation has been commissioned to study the receptiveness to innovations in health care, in this case with a focus on enabling a more network-based health care system. Network-based health care has emerged in the last years as a potential solution to a fragmented and increasingly specialized health care situation.

This is a challenge, since the change needed is on several levels and involves many actors. A system change can by its nature not be treated as an isolated intervention, because it is not possible to keep the environment constant and evaluate the effect of the intervention. If you nevertheless choose such an approach, which is not uncommon, the probability is very high that the effect of the change will fail or become negative. In this report we aspire to take a system view, and investigate underlying and interacting factors that affect the receptiveness to innovations.

This is an English summary of a more extensive report in Swedish. The content of the report is the work of external researchers, and not an ExDin document.

Background

Receptiveness to innovation is a problem in today's health care system. Leading Health Care is following a number of innovative projects in the health sector in order to examine the barriers that exist. The work is done taking an action research approach, identifying the actual challenges in the implementation process through interviews and observation. The ExDin project and their infrastructure for image sharing is a good example of an innovation. In this report we approach ExDin as an innovation in network care, where the technical solution must be combined with new working methods and relationships between the parties involved.

We have based the analysis mainly on theories on innovation and innovation management, implementation studies, sourcing and outsourcing, network organisation, operations management and organizational design.

Network-based health care

Network-based health care has in recent years been increasingly emphasized as an option for the development of health care. One reason lies in technological developments that have made it possible to share information easily, and thus to cooperate within a network of organizations without having to gather geographically. It is increasingly common for hospitals and clinics to allow external parties to review images and medical data, with the benefits and challenges it entails.
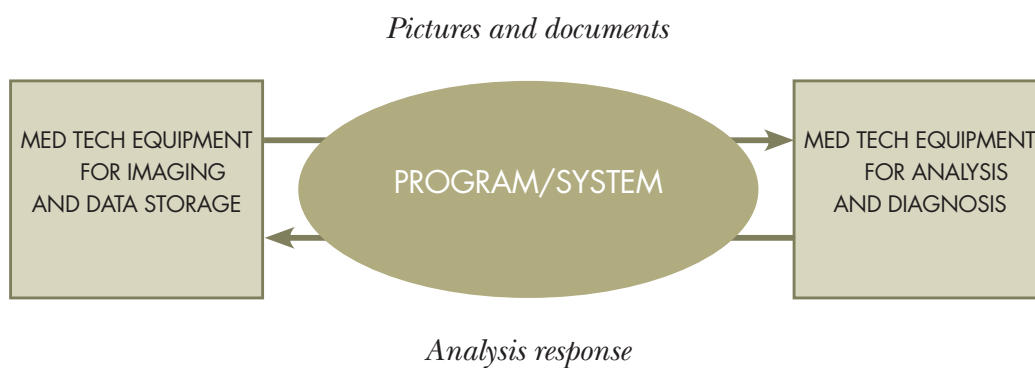
Picture rating is an advanced but consistent and measurable task. From an outsourcing perspective, these characteristics make it suitable to be carried out by external experts. Sourcing can take various forms, either as a market-based buy-sell relationship or as a long-term partnership. The need for long-term relationships varies depending on the nature of the sourced service. A standard product that is well defined and identical for several clients so that both parties know what is expected, allows for a more market- based relationship. In the case of a service that requires joint assessments depending on the patient and the situation, a long-term relationship with a closer partnership is preferable.

The ExDin project

The ExDin project aims to create conditions for cooperation between experts around digital image review. The project uses a technical service platform developed by the company RxEye, that can form the basis for new ways of working in health care. The idea is to create a network of users in need of analysis, other users with the capacity to perform the analysis, and mechanisms to link these via an independent system.
Stakeholders in the ExDin project consist of Stockholm County Council, County Council of Blekinge, Regional Cancer Center Stockholm - Gotland, Royal Institute of Technology / STH and Blekinge Institute of Technology, and RxEye.

RxEye's responsibility within ExDin consists of adapting its service platform, which can link together actors in health care and share resources between them. RxEye offers a web-based infrastructure for communication and sharing of information in radiology and pathology. The technical solution manages the transmission of images and patient information, sharing of assignments, contracts and legal issues relating to the collaboration, analysis requests, response times, compensation schemes and the opportunity to generate aggregated data for monitoring.

Pictures and documents

| MED TECH EQUIPMENT FOR IMAGING AND DATA STORAGE | → PROGRAM/SYSTEM ← | MED TECH EQUIPMENT FOR ANALYSIS AND DIAGNOSIS |

Analysis response

The software is still under development, and additional functionality is regularly tested with users.

Visions

The ExDin project tests a technical solution that could be the basis for new, innovative ways of working in health care. Development initiatives include providing infrastructure for multidisciplinary team meetings (MDT) in cancer care. MDT:s are of frequent use in the assessment of cancer diagnoses, but take a lot of time if they are to be performed on site. Today, much of the necessary coordination and documentation is done manually, and there is significant potential for simplification of the process and improvement of the quality of information shared.

Drivers

There is currently a strong push to develop network-based care, where health care providers share information amongst themselves to a greater degree. This requires technical solutions that enable collaboration across borders, and experience from the ExDin project can feed into this effort.

There are already strong professional networks in health care, where collegiality within a specialization is often stronger than organizational affiliation. This in itself is a situation that creates a demand for cross-border collaboration.

The ExDin approach can strengthen the profession and make specialization possible even in the smaller units. Specialists get a greater reach and the access to them by the smaller units can also increase. The development of additional sub-specialization drives a need for further cooperation.

Today there are shortages of several specialties within the health services, for instance pathologists. Low regrowth in combination with age resignation may aggravate the situation in the future. In order to maintain specialist functioning, interaction will be necessary in many places.

Sending images between units is done regularly as of today. One problem, however, is that many technical systems are not compatible. Moreover, much of the interaction takes place with relatively primitive tools, as by fax or courier of glass and images. ExDin uses a neutral technology platform that enables larger interconnected networks and a considerably streamlined process.

An effective collaboration solution can bring efficiency gains in the form of shorter lead times, better use of specialists, better functionality of the smaller units, higher quality, improved learning and local skills development, and less duplication and errors in the process.

Hinders for receptiveness – framework

Innovation is of great importance for both quality and resource efficiency in our future health and social care. We see the need for a research-based approach to innovation and receptiveness to change. One first step is to describe the most significant factors that hinder receptivity today. We have identified a number of different types of obstacles:

- Budgets and reimbursement models
- Rules and guidelines
- Organization and management
- Technical systems and IT
- Professional standards and history
- Local expertise and skills

The categories are derived from an analytical framework around barriers to receptivity of innovations in health care that has been developed within LHC's Vinnova project, see separate document.

Observed hinders and challenges in the case of the ExDin project

After analyzing our empirical data, we have identified obstacles that are central and already pose a problem, obstacles that can lead to problems in the future if not dealt with, and finally potential barriers that seem to be currently under control. Below is a presentation of the different types of hinders and challenges observed in the ExDin project.

Budgets and reimbursement models

Business models and compensation schemes is a question that is explicitly handled in the ExDin project. There are built in functions to set up agreements and calculate payments. However, there are still obstacles in the established way health care works in today. Transfer prices and allowances between entities need to be negotiated, which can lead to conflicts and represents and administrative burden. Today, a lot of cooperation and support takes place informally and without a price tag, and it can be challenging to draw the boundary between what should be priced and what should be voluntary peer interaction.

Conclusion:
- ExDin handles much of the technicalities surrounding reimbursement and interaction.

- Levels and principles must be negotiated, which can be a problem, because the benefits of collaboration relationships are always complicated to calculate.

Rules and guidelines

Rules and guidelines have been perceived as something that must be handled before collaboration can be considered, and ExDin has put a lot resources into juridical clarification. There are still some question marks, but these are under management and awareness is good about the potential barriers due to existing rules and guidelines.

Conclusion:
* Rules and guidelines are to a large extent handled in the contract design of ExDin.

Organization and management

The way the organization and management of care is set up can cause many problems when it comes to introducing new ways of working. Something that was emphasized by all the actors we interviewed is that organization and management can be a serious obstacle in different ways and at various levels. An overarching problem is that there seems to be no clear mandate for implementing change in hospital organizations. ExDin challenges existing organizational structures and procedures, which could lead to problems.

Central governance
Politicians and policymakers highlight increased cooperation between caregiver units as the desired way forward, but how this will happen is not entirely clear. Cooperation requires clear roles, division of tasks and flow of patients between units. This is a vision, but still lacks implementation as a functioning structure. The surrounding uncertainty is an obstacle to proceeding with interaction between units.

Hospital management
A recurring problem is the difficulty of making decisions that involve multiple departments or entities, both within hospitals and between hospitals or principals. No one has the authority to make these decisions, or no one wants take on the responsibility. This means that changes are often limited to single units, while systemic changes become problematic.

A network-based health care poses several challenges for management. Virtual teams are created through collaboration across organizational boundaries and across professions. Patient-centered teams whose members belong to multiple organizational units represent a new dimension to manage. Professionals in an organization can be included in three separate management structures, a line organization within their own organization, a professional affiliation within their specialty, and now also a patient-centered team that may extend across organizations.

Local management and work processes
A common standard is needed in order to collaborate around a patient or a review. This applies both to cooperation between individual specialists and between hospitals in terms of procedures and processes. How to document, what codes to use, who will contact whom and communicate what to whom?

Working with resources in a network involves challenges and poses new demands on working arrangements, production and information flows. It also challenges the existing structures and roles, and requires adaptation of ancillary practices and procedures.

Conclusion:
In the area of organization and management there are serious obstacles that must be addressed:

- There are ambiguities at the highest level regarding the future of network care.

- In hospitals there is significant change inertia and managers lack the mandate to make systemic changes.

- Locally, change is difficult to achieve because of the number of persons involved and unclear decision mandates.

- Processes and practices are partially undeveloped and differ between entities.

Technical systems and IT

The technology in itself is not perceived as problematic, but the philosophy of how IT structures shall be governed and constructed is a larger problem. There is local resistance against what is perceived as an unconventional solution. Local IT departments have been seen to distrust RxEye and their novel way of treating data. Hospitals are accustomed to owning and controlling their own technology and their own data. This is challenged by RxEye which is an external service based on streaming data. The problem is not technical, but a matter of understanding and confidence in the new solution.

Conclusion:
- The technology itself should not be a problem.

- Resistance from other technology stakeholders, especially IT departments, is an obstacle.

Professional norms

Those who have a central role in the present health care system may feel challenged by new ways of working. So need not be the case for everyone, but it is likely to occur in some places. Underlying causes may be concern about loss of quality, safety, control, or other important aspects that can be affected by the change.

One aspect of collaboration and network care is that data is transferred to other units, which means that some tasks no longer are carried out within the unit. A reduced workload may mean downsizing, which can be seen as a negative development for those units whose production is affected.

An important aspect of collaboration is trust in the other party. It is a relationship that takes time to build, is often dependent on certain individuals and therefore vulnerable.

Conclusion:
- The profession provides support but is also a potential obstacle when it comes to interaction in networks.

- Working in networks supports specialization, but personal roles need to change, which can be an obstacle.

- Confidence is highlighted as a very important factor, and this is based on personal relations.

Local expertise and skills

When the actors are already working with digital image review, the inclusion threshold does not appear to pose a major problem for ExDin. Introduction to the new system is easy and quick. In this way, competence and skills for using the system is a non-issue.

Conclusion:
- Professional development is not a problem - ExDin requires nothing new from the users, and is not difficult to learn.

Conclusions and discussion

There are a number of supporting factors, but also a number of barriers that need to be handled to facilitate the introduction of an innovation of the type that ExDin represents.

Based on the collected material, we have made an analysis of whether the identified obstacles we see in each area is under control, poses a potential problem, or represents a clear problem. As illustrated below most critical area at the moment is the organization and management. Questions about the processes, procedures, mandate to take decisions and change inertia is an obstacle that must be addressed, or else risk the initiative to stop.

Area	Under control	Potential problem	Problem
Budgets and reimbursement models	🟩	🟧	
Rules and guidelines	🟩		
Org and mmt – Central governance		🟧	
– Hospital management		🟧	🟥
– Local mmt and work process		🟧	🟥
Technical systems and IT	🟩	🟧	
Professional norms	🟩	🟧	
Local expertise and skills	🟩		

The most serious obstacles are found at the system level. Structures for collaboration between units and actors are lacking, and mechanisms to establish and maintain working relationships are not well developed. It is a challenge to manage the three leadership dimensions simultaneously; the line in the form of units within the hospital, professional and specialist structures between hospitals and finally patient-centered groups and processes. There seems to be a lack of forums and mechanisms for this today, making a system change difficult to achieve.

In order to so succeed with innovative new solutions such as this example of network care, we need to put more resources into the last phase of the innovation process, the actual implementation and the organization's ability to change and adapt. It is a neglected area, and most likely one of the premier reasons that many innovations are not going beyond the pilot stage. We continue our research on this, and will be back with more reports in the next few years.

This report was produced in cooperation between Leading Health Care, Vinnova and KTH. The full report in Swedish is available at *www.leadinghealthcare.se.*