The Innovation Centre: A Hospital Infrastructure for Innovations in Health Care

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Abstract. In 2011 a new organisation, the Innovation Centre, was initiated at Karolinska University Hospital. The Innovation Centre aims at gathering academia and industry to, together with the hospital and other health care organisations, innovate new solutions for health care. In this paper we describe how the Innovation Centre was initiated, how it is organised, and some of the strategic initiatives. We also reflect on what effects the Innovation Centre can give and how it is adopted by academia, industry and healthcare.

Introduction

The idea of the Innovation Centre (IC) started to grow already in 2004 when the department of Surgical Gastroenterology (Gastro) at Karolinska University Hospital in Sweden was appointed the responsibility for highly specialised care in the upper part of the abdomen. In order to achieve this, a coherent care chain was developed (Groth & Scholl 2013) including telemedicine solutions for activities such as multi-disciplinary team meetings (MDTMs). At this point Karolinska as well as the county council invested in a video infrastructure within Karolinska, including a video bridge and video equipment at Karolinska as well as at local hospitals, to be used at MDTMs and other activities including remote participants from partner hospitals.

Other initiatives at Gastro were: developing a tool for sharing information from Electronic Medical Records (EMRs), participation in a European project focusing on developing an open source platform for high definition video conferencing (hdviper.org), initiating and participating in a three year cooperative design project focusing on developing support for information availability (cf. Frykholm 2012). The third author was head of Gastro at this time, and also the person that initiated the IC, and is now head of the Development and Innovation at Karolinska and part of the hospital management board.

The Innovation Centre

The Organisation

The Innovation Centre (IC) is part of the Development and Innovation (D&I), organised directly under the hospital management. Two other units are organised under D&I; Biomedical Technology and eHealth and strategic IT. In total, 350 employees are organised under D&I, among which 30 are employed at the IC. The IC is the main contact point, both from inside and outside the hospital, towards all innovation and development work within Karolinska.

The IC provides resources for legal procedures, contacts with clinical personnel, as well as routines for deciding on the value of projects. The IC is also, in collaboration with the other units under D&I, developing resources for testbeds within informatics, telemedicine, and radiation therapy, routines for establishing health care at a distance, and routines for bridging the gap between research and clinical practice within cell therapy.

Strategic initiatives

A number of strategic initiatives have been started at the IC, among which some of them are:

Consultation at a distance, which includes telemedicine development to enable, for example, an expert surgeon to guide a less experienced surgeon performing interventions. We are currently working with telemedicine development for remote endoscopy support (Påhlsson et al. 2013), and with remote trauma support during resuscitations (Nilsson et al. submitted for publication). The driving force in both projects are from the clinical side. The role of the IC is to facilitate the projects in general, and to establish contact with project partners (e.g., service providers within video).

Home care at a distance, which includes telemedicine development to enable, for example, the patient to be home while under treatment at the hospital. A proof-of-concept with three patients has been conducted in a project focusing on home titration. A neurologist and home care team used videoconferencing to titrate the medicine level for patients with Parkinson's disease. Currently a national study is being designed, and technologies for recording movements used to judge the patient status are evaluated (e.g., based on the Kinect platform). The idea of home titration came from the third author when being manager at Gastro. Now the project is driven from the IC in collaboration with the neurologist and project partners from the industry (drug, software and video).

Coordination of patient flow, which includes implementing a logistic system for managing patients in the ward. The project was originally a partnership

with a software development company but was closed down mainly because of implementation and integration problems. However, one of the wards kept the system because they did not want to go back to a regular whiteboard. A smaller evaluation made a year after closing down the project indicated that the logistic system reduced the time for getting satellite patients to the right ward with 30%. Further evaluations will now be conducted and the project may be restarted but with a different focus and in a smaller scale. The project was driven from the clinical side, with the IC coordinating the project.

An infrastructure for future electronic medical records, which includes developing a platform that can integrate different electronic medical systems, on which different kinds of application can be built. This is running as a proof-of-concept in collaboration with the county council. The unit eHealth and strategic IT is responsible for the D&I participation with representatives from university and the IC in the steering group.

Discussion

Today the IC has existed only one and a half year, but counting the early efforts at Gastro the infrastructure has evolved over a longer period of time. We have identified a number of success factors, which also can be seen as challenges, for the kind of organisational infrastructure for innovation development that the IC provides:

Management support: One of the most important parts for succeeding with an organisation such as the IC is that it is supported by the hospital management. In the early innovative efforts at Gastro not only the managers of the clinic and of the hospital were supportive, also the county council financially supported the infrastructure that was developed. What Gastro achieved could not have been done without that support. Similarly, the IC could not have been organised without the support from the hospital manager.

Cross-organisational: Projects are involving not only the IC but also other partners within D&I, within the hospital, and outside the hospital. Different resources are needed in order to achieve good results. Several of these resources can be found outside the IC which means that partnerships with other organisations within the hospital, academia and industry are crucial.

Main entry point: The IC is the main entry point, both from inside and outside the hospital, at the hospital regarding collaborative projects aiming at developing innovations for health care. There has been a tradition of conducting projects in collaboration with different vendors within the clinics, which may lead to systems that cannot be properly maintained and

supported, or that does not follow patient safety regulations. This tradition needs to be broken, which is something that will take time. To do so, necessary resources such as routines for managing legal issues, hospital regulations, security issues, testbeds, validation of project ideas, contacts to clinical settings etc are easily accessible through the IC. Some of these resources have been developed within the IC, while others are accessible through partner organisations.

Strong funding: A large amount of effort has been spent on writing applications to get external funding for building the infrastructure at the IC as well as for innovative projects. Apart from external funding, health care organisations in general also need to be part of funding new solutions. Therefore, Karolinska also supports the IC economically. Not only Karolinska has been supportive in this regard, but also indirectly the county council by initiating a collaboration with technical faculty, thereby providing possibilities for increased number of research projects within health care.

Driving projects from within: Projects that involve new solutions for clinical services also need to have participants from the clinical side, preferably driven from within by clinicians. This enables access to resources from the clinical setting as well as providing for the implementation of new technologies within the clinical setting.

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References

Frykholm, O., Nilsson, M., Groth, K. & Yngling, A. (2012) Interaction design in a complex context: medical multi-disciplinary team meetings. *Proceedings of NordiChi*.

Groth K, Olin K, Gran O, Permert J. (2008) The role of technology in video-mediated consensus meetings. *Journal of telemedicine and e-health*, 14(7).

Groth, K. & Scholl, J. (2013) Coordination in Highly-Specialised Care Networks. *Proceedings supplement CSCW*, Interactive Poster.

Nilsson, M., Yngling, A., Groth, K. Jernling, C. & Hammarquist, F. (2013) Remote supported trauma care: Understanding the situation from afar, to appear in Proceddings of CBMS 2013

Påhlsson, H. I., Groth, K., Permert, J., Swahn, F., Löhr, M., Enochsson, L., Lundell, L. & Arnelo, U. (2013) Telemedicine: an important aid to perform high-quality endoscopic retrograde cholangiopancreatography in low-volume centers. *Journal of Endoscopy*; no 5.