eHealth Governance – a Study of Cross-border Collaboration areas in Health Care Information Infrastructures

Malin Nordström
Linköping University
malin.nordstrom@liu.se

Jenny Lagsten
Örebro University and Linköping University
jenny.lagsten@oru.se

Abstract. In this paper we investigate appropriate cross-border collaboration areas, by introducing the concept eHealth governance area (eHgov area). Our basic principles lie in the perspective of information infrastructures and IT governance, and investigate areas of collaboration in health care. The empirical data originates from a study in Swedish health care. Our conclusion from this study implies that the basis in workflow processes is the key issue to reach appropriate cross-border collaboration in health care. In the paper we identify 9 areas for collaboration; laboratory test diagnosis, dental care, perioperative care, pregnancy and obstetric care, emergency medical care, imaging and functional diagnosis, prescription, patient administration, and medical records.

In order to deal with growing ICT and IT artifacts, the Information Infrastructure (II) perspective was introduced in the middle of the 1990s. (Hanseth, 2002). Keywords are inter alia sharing, evolving and standards (ibid; Hanseth et.al, 2012). The health care sector is characterized by complex organizational dependencies, diverse technical solutions, highly professional processes and actors, and a great need for information exchange. The disciplinary professional boundaries are a result of highly qualitative work and have evolved over a long time (Winthereik and Bansler, 2007). This context is well explored in studies of implementation and the use of electronic patient records systems (ERP) (e.g. Larsen and Ellingsen, 2012). The health care sector is therefore suitable as a study area for II research (Bygstad, 2010). One of the characteristics of II is sharing, which means that II crosses both professional and organizational borders

(Henningsson and Hanseth, 2011). The cross-border dimension in health care raises the need for collaboration in responsibility and decision-making concerning II. Within IT, responsibility and decision-making is often labeled IT governance (De Haes and van Grembergen, 2004; Weill, 2004). In this paper we address the need for collaboration in areas of decision-making in an II health care cross-border context. As long as the collaboration areas are unknown, it is difficult to govern II in a desirable direction. Our research question is therefore: Which areas of collaboration, concerning II, exist in the Swedish health care sector?

IT Governance in Health Care

Nowadays, IT governance ranks high on executives agendas (De Haes and Van Grembergen, 2004), and the health care sector is no exception (e.g. Hanseth, 2010). In order to organize IT governance appropriately, one needs a mixture of structures, processes and adequate behaviors. In a cross-border context, this means that organizations have to agree to, on some levels, a joint IT governance. This need for cross border collaboration is not new. Practitioners have struggled with governance problems, known as maintenance, for a long time (Hiddings, 2012; Nordström et. al., 2011). Grembergen (2012) adds enterprise to IT governance and switches order. He suggests enterprise governance of IT in order to stress the enterprise and work practice dimension of IT. This is in line with Nordström et. al. (2011), who advocate collaboration areas (labeled maintenance objects) with basis in work processes or product/services instead of the more traditional IT artifacts or organization as basis for collaboration. Weill also (2004) argues for collaboration areas (labeled organizational practices) where business and IT people can meet. Weill (2004) has specified success factors for IT governance - i.e. great return on investments - for top performing enterprises as: clarifying business strategies and the value of IT to them; assigning responsibility to organizational changes required from changed IT capabilities; and becoming more adept in sharing and reusing IT capabilities.

The term "eHealth" enables health care and technology to meet (Oh, 2005). We hence label IT-governance collaboration areas in health care – eHealth governance areas (eHgov areas). With basis in the perspective of II and IT-governance theories we summarize the characteristics of eHgov areas to;

- Take basis in workflow processes or products/services and cross-organizational boundaries
- Address workflow process evolution as well as technical
- Use standards and support evolutionary and reuse processes

Research Design

The research in this paper is based on the defined collaboration areas in 13 (out of 20) Swedish county councils. The empirical data, documentation of collaboration areas, was collected through interviews with the managers at each council responsible for the collaboration area architecture. In this paper we have limited our empirical data to core health care processes, which means that we have left out documentation concerning ICT and support processes such as finance, human resources and archiving in the studied health care organizations.

eHealth Governance Areas in Swedish Health Care

In order to govern a complex ICT and IT artifact portfolio, a majority of the county councils, have chosen the pm^3 governance model. pm^3 was initially a model to handle maintenance management but has through research (Nordström, 2005) and practice application (Nordström and Welander, 2007) developed into an IT governance model focusing on maintenance portfolios. Our study showed a total number of 20 eHgov areas that Health Care organizations in Sweden have chosen to implement as cross-border collaboration areas. In the study, the same eHgov areas were named differently, and, in some cases, an area in one organization covered two or three areas in another organization. All studied eHgov areas had their basis in health care processes. The pattern that appeared during our study was made up of two different types of processes; (1) professional dependent e.g. perioperative and dental care and (2) professional independent e.g. patient administration and prescription. After an analysis, we identified eight eHgov areas (figure 1).
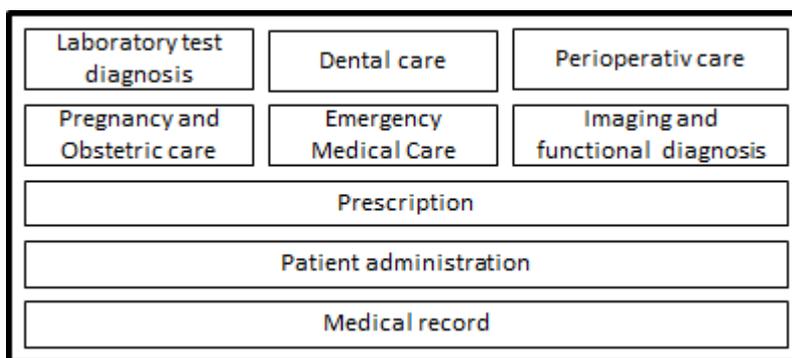

Figure 1. Identified eHealth governance areas after analysis.

The studied organizations have organized their IT governance with the eHgov as a basis. They make decisions in *steering committees* that have distributed responsibility for work practice changes as well as for technical development.

eHealth Governance Areas – Summary and Implications

The characteristics we stated earlier in the paper serve as a basis for summary and implications. The first characteristic we identified was: *take basis in workflow processes or products/services and cross-organizational boundaries*. All identified eHgov areas are based in the workflow processes and thereby cross-organizational boundaries. However, there are professional boundaries in some of the areas of collaboration, e.g. Pregnancy and Obstetric. But this seems reasonable because of the second characteristic; to *Address workflow process evolution as well as technical*. Professional disciplines in health care have evolved through high quality work over a long period of time (Winthereik and Bansler, 2007) and, therefore seem reasonable as grounds for collaboration. The profession as a collaboration area is not new, there already exist professional networks in all these areas. The third characteristic is *support evolutionary and reuses processes*. A basis in workflow processes contributes probably itself to the evolutionary idea, by moving focus from artifact to workflow. Previously in this paper we identified an evolutionary element in eHealth governance; why did Dental care appear as an eHgov area and not, for instance, Mental care? Our guess is that there is a need for collaboration in "eDental Care", but the need has not yet occurred in "eMental care". This implies that we have to be aware of new needs of collaboration over time. The pm3 model itself can be seen as a standard for cross-border collaboration. Steps have already been taken to collaborate at a national level between eHgov areas. One conclusion from this study implies that the basis in workflow processes is the key issue to reach an appropriate cross-border collaboration in line with the II perspective.

 We have identified 9 eHgov areas; laboratory test diagnosis, dental care, perioperative care, pregnancy and obstetric care, emergency medical care, imaging and functional diagnosis, prescription, patient administration, and medical records. These areas are based on the division into areas in 13 (out of 20) county councils responsible for the health care in Sweden. The eHgov areas are strong structures influencing the overall organisation and governance of IT in health care in Sweden. The identification of areas enables examination and discussion of the cultivation of these structures towards a mature eHealth where IT efficiently supports core health processes. Our further research will investigate the cross-border collaborations in these eHgov areas. It is also important to study how the areas are handled at the national level; in national eHealth strategies and in the efforts turning eHealth policies into practice.

References

Winthereik, B. R. and Bansler, J.P. (2007). 'Connection Practices: ICT infrastructures to support integrated care' *International Journal of Integrated Care*, Vol. 7 pp.1-2.

Bygstad, B. and Hanseth, O. (2010). 'IT Governance through Regulatory Modalities. Health Care Information Infrastructure and the "Blue Fox" Project', In: Kautz, K. and Nielsen, P.A. (eds): *SCIS 2010*, LNBIP Vol. 60, pp.50-64.

De Haes, S. and Van Grembergen, W. (2004). 'IT Governance and Its Mechanisms' *Information Systems Control Journal*, Vol. 1, pp. 27-33.

Hanseth, O. (2002). 'From systems and tools to networks and infrastructures. Towards a theory of ICT solutions and its design methodology implications'.

Hidding, G. J. (2012). Information Systems as a Professional Discipline: Focus on the Management of Information Technology. *Journal of Organizational Computing and Electronic Commerce*, vol. 22(4), 347-360.

Henningsson, S. and Hanseth, O. (2011). 'The Essential Dynamics of Information Infrastructures'. In Proceedings: *32th ICIS*, Shanghai, paper 14.

Larsen, E. and Ellingsen, G. (2012) 'Establishing a Core Health Record; A Case Study from Norwegian Healthcare'. In Dugdale et. Al. (eds), *From Research to Practice in the Design of Cooperative Systems: Results and Open Challenges*, pp. 1-15 Springer-Verlag, London.

Nordström, M. (2005) *Styrbar Systemförvaltning – att organisera förvaltningsverksamhet med hjälp av effektiva förvaltningsobjekt*. Doktorsavhandling, Institutionen för Datavetenskap, Linköpings Universitet. [In Swedish]

Nordström, M., Axelsson, K., Melin, U. (2011):'Exploring the Characteristics of Information Systems Maintenance – Defining Focus and Content through Objects' In Proceedings: Salmela, H., Sell, A. (eds.) *Nordic Contributions in IS Research*, LNBIP vol. 86 pp. 112-123.

Nordström, M. and Welander, T. (2007). *More Business Like Maintenance Management,* *Studentlitteratur,* Lund.

Van Grembergen, W. (2010). 'From IT Governance to Enterprise Governance of IT: A Journey for Creating Business Value Out of IT', In Cellarey, W. and Estevez, E. (Eds.): *13E, 2010, IFIP AICT 341*, p.3.

Weill, P. (2004) 'Don´t Just Lead, Govern: How Top-Performing Firms Govern IT' *MIS Quarterly Executive*, 8(1), pp 1-17.