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Health Information Technology in Denmark: Forming the Basis for an Effective Health Information Technology Strategy

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The effective deployment of information technology to improve healthcare has truly become an international objective, with major national programs being developed or well under way in a number of countries, including Canada, the UK, Denmark, Taiwan, and other countries. The objectives of such programs include the development of interoperable and effective healthcare information systems to provide up-to-date and timely health information across regions and time and to provide effective health data access to patients, providers and citizens.

In this article we look at some of the characteristics of Denmark that have formed the basis for achieving its current success in healthcare information technology. The objective of work along these lines is to begin to see where approaches and solutions from different countries might be applicable, to share ideas and experiences internationally and to encourage exchange of information across borders about the successes, challenges and issues encountered in the complex task of developing interoperable healthcare information systems.

In a recent article by Professor Denis Protti (Protti, 2008) the health information journeys of several countries are described. In particular, Denmark has been noted to have achieved some impressive accomplishments in health information technology.

To date some of the most significant accomplishments in Denmark include the following:

- Secure intranets established across regions, local authorities and other organizations, linked by an Internet-based healthcare data network through VPN connections
- Penetration and rate of use of the healthcare data network that is 100% for General practitioners, 74% for full time specialists, 100% for pharmacies and 100% for local authorities
- eHealth services delivered by the network include: referrals and discharge summaries, prescriptions, teleradiology and teledermatology services, and look-up of laboratory results through the National Health Portal
- Over 4 million standardized medical documents sent as EDI (Electronic Data Interchange) per month, representing 80% of all communications in the primary healthcare sector
- Establishment of a National e-Health Portal, **Sundhed.dk**, which was launched in December 2003 and provides a single access point to healthcare services for both citizens and services
- Using their digital signature, citizens can log on their personal web space in order to book appointments, order medications and renew prescriptions, review their own medication and health care data and communicate with healthcare authorities (according to Protti, in 2008 there were approximately 175,000 unique visits to the portal per month)
- Since 1996 the Danish organization MedCom has developed EDI standards based on the EDIFACT syntax and these standards have also been developed in an XML format version for future hospital communications (MedCom approves computer systems for their ability to receive and dispatch EDIFACT and XML documents)

- Health care professionals (using special security certificates) can access patient data and laboratory results and access various resources such guidelines and clinical pathways

Over the past year, we have been fortunate to be able to travel to a number of countries, including Denmark, where we have seen first hand innovations and approaches to strategies for deploying electronic health records in regions where impressive strides have been made. As importantly, we are very interested in understanding the conditions, in terms of healthcare programs and national structure and organization that form the basis for successful national programs and initiatives in health informatics. Such descriptions may help in the comparison across countries in order to determine where and how successful components of strategies might possibly be incorporated here and abroad.

Interview with the Danish Minister of Health

In order to gain more information about Denmark's conditions and strategy for eHealth the Danish Minister of Health, Jakob Axel Nielsen agreed to respond to a set of preset questions. In responding to the first question about the overall Danish healthcare system, the Minister noted that much like Canada it is based on a principle of free and equal access for all citizens, with general practitioners acting as "gate-keepers" with regard to hospital treatment and treatment by specialists. "The healthcare sector, much like Denmark as a whole, has three political and administrative levels: the state, the regions and the municipalities (national, regional and local levels)." The Minister went on to state that "The healthcare service is organized in such a way that responsibility for services provided by the health service lies with the lowest possible administrative level. Services are thus provided as close to the users as possible." Recently, with local government reform that became effective on January 1, 2007, the previous system of 15 counties and 271 municipalities was replaced by 5 regions primarily focused on the healthcare sector (with 98 municipalities responsible for a variety of welfare services).

A new National Strategy for the Digitalisation of the Health Sector 2008-2012 was adopted in January 2008, having the following goals: (1) digitalization (2) better service for and inclusion of citizens and patients, and (3) stronger cooperation for digital connectivity. The organization Connected Digital Health has been established for implementing Denmark's eHealth strategy, which forms an overall governing tool (with implementation in the form of various projects and programmes), with approximately 30 employees. An important aspect of the strategy, pointed out by the Minister, is the following: "A fundamental principle in relation to the present strategy is that it is a stable overall governing tool. The strategy does not operate with fixed number of initiatives to be carried out during the strategy period because the environment in which the strategy operates is dynamic, and need in the sector changes over time… It builds on incremental digitalization of the whole health sector. Solutions will be developed that fulfill specific needs, with the overall vision of a digitally connected health sector in mind."

Connected Digital Health currently has four main programmes (each involving a number of projects):

1. National Patient Index
2. Medicine Profile
3. IT Architecture, Standardization and Security
4. Telemedicine

Examples of current projects include increasing access to x-rays with descriptions accessible across hospitals and secondary and primary care. A further example is the ongoing evaluation of international standards, in particular in relation to national needs in order to support establishment of a portfolio of standards addressing specific issues.

When asked about what has formed the basis for eHealth successes to date in Denmark, the Minster responded with the following: "I believe a prerequisite for success is good coordination and close collaboration with the various interested parties. When talking about digital healthcare, all projects must have a strong connection with all relevant stakeholders, and the solutions developed should always address specific identified needs."

Can we benefit from greater knowledge of international projects in e-health?

It is clear that greater understanding of other countries strategies is a good thing. Along these lines we feel consideration of accomplishments of countries like Denmark and understanding of the differences and similarities with their underlying healthcare systems will be of importance to moving national and international programs towards their goal of achieving a more effective and streamlined healthcare system.

Despite the many differences across geographical and political boundaries it is clear that many countries globally share similar objectives of improving healthcare through information technology - warranting further detailed analysis and study of international efforts and approaches. Indeed we feel that "internationalization" of health informatics is becoming an important and growing trend that should be strongly promoted and pursued to share information about successes. ●

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