Danish eHealth Activities and Developments

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MedCom - Danish Health Data Network

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The Country Health Care and eHealth
Denmark

- 5.45 mil. Citizens
- Area: 43,000 km²
- Highest point: 171 m!
- But highest Broadband Penetration (30%)
- Extensive access to internet
- Unique personal identifier
Danish Health Sector

5 Regions: Health Care
98 Municipalities: Home care
- 60 Public hospitals
- Small-sized private hospitals
- 2000 GP clinics
- 1100 Specialists
- 330 Pharmacies

Largely Tax paid
Co-payment for dentistry and medicines

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Danish Health Care

- **Annual health care expenditure:**
  app 70 billion DKK (10 billion Euro)
  
  - 26 % Primary health care
  - 66 % Somatic Hospitals
  - 8 % psychiatric care
  - 8,7 % of GN
  - 85 % of health care cost financed by taxes
  - Low rise in costs
Municipal/Social Sector

- Nursing Homes
- Rehabilitation
- Home Care
- e-Inclusion/ambient assisted living
- Tele-homecare

All adds up to what Danes call:

Welfare Technology and New Communication partners
National Challenges (Problems)

- Shortage of Skilled Human Resources
- Patients’ Waiting Lists
- Age and Chronic Conditions rise
- Investm’t Plans but No Change of Mind Set
- No financial Incentive – only Punishment

And on the IT side:
Interoperability, scalability, modularity and compatibility of systems
Three Executive eHealth Bodies at National (MoH) Level

• 1. Connected Digital Health in DK (SDSD)
• 2. The Health Portal www.sundhed.dk
• 3. Medcom

In Collaboration with Regional and Municipal IT organizations vendors and other stakeholders:

Consensus Formation is Key
Use of ICT in Danish Healthcare
IT Market in Danish Health

- 12 Hospital PAS/EPR vendors
- 12 Primary EPR vendors
- 11 Laboratory vendors
- 8 X-ray vendors
- 5 Specialist EPR vendors
- 4 Pharmacy vendors

60 IT vendors with 100 IT systems that communicate nationwide across sectors
We have:
- MedCom (1994)
- Telemedicine (2000)
- National Health Portal (2002)
- National eRecord (2006)

We plan:
- SNOMED CT (2009)
- Improved Medication Record
- Nat. Patient Index and Summary
The Existing Personal Medicine Profile (PMP)

- A register of prescribed and dispensed medicines. All purchases are registered automatically
- Physicians have access to the register on patients being treated
- The patients have no possibility to object such access
Health care information

- **National Board of Health**
  - Classification, coding and terminology standards
  - National Patient Registry (hospital episodes)
  - Cancer, maternity, etc. registries
  - Death causation registry
  - DRG and GP payment registries

- **Institute for Quality and Accreditation (IKAS)**
  - Accreditation survey data

- **Regional Councils**
  - National Quality Indicator Project
  - Patient Satisfaction Surveys
  - More than 40 national disease specific clinical databases
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Data Security – Confidentiality Legislation
Legislation

Danish Data Protection Agency monitors all activities!

1. Act regarding Patient Data Confidentiality
   - Complies with directives in other EU countries

2. Danish act on Processing of Personal Data
Main rules conc. privacy

• Confidentiality
• Patients consent is needed whenever confidential information is shared with other health care professionals
• Patients written consent is needed to disclose information to people and institutions outside health care
medical data, privacy & protection of data

• Background; Health care in Denmark
• Unique Patient Identifier
  – CPR – Central Person Registry
• The Danish Health Data Network
  – Connection Agreement System
• PKI – software and not smart card based
  1. Citizen’s digital signature
  2. Professional’s digital signature
The Patient

- Each person has
  - a unique identifier f. ex. 270767-3247, and if so wanted
  - a digital signature to access *i.a.* Sundhed.dk
- The patient owns his/her own patient data
- Legislation requires proof of patient consent prior to delivery/transmission of data
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MedCom

Communication standards, Messages and Infrastructure and Certification
MedCom

Area of expertise:

Making IT projects “cross sector borders”.
Using standardized solutions.
Focus on large-scale, national implementation.

Consists of:

Ministry of Health (chair)
Danish Regions (co-chair)
Association of Local Authorities
Ministry of Social Affairs
National Board of Health
Danish Doctors
Danish Pharmacies

- and they pay!
1. MedCom makes standard-solution
   In cooperation with users, IT vendors and health authorities.

2. Validate in pilots
   The solutions are integrated by participating SW vendors in their IT systems.

3. Dissemination
   MedCom support users and vendors. SW vendors sell developed solution to all their customers.
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MedCom 1994 - 2007

1994 – 2002
- Primary Care - the six flows

2002 – 2007
- Internet Web applications
The most frequent flows in primary Health Care
MedCom profiles – Why?

Referral
Prescription
Home Care Report
Radiology Report
Discharge Letter
etc.

All-to-All communication

Off-the-Shelf products
No integration without semantic interoperability
Example:
MedCom II 1997 - 99.

Create large scale national wide dissemination

Edifact
Lægesystemer - Modtager

Aftestning og godkendelse af De gode EDI-breve

<table>
<thead>
<tr>
<th>Modtager</th>
<th>Test og godkendelse i ugerne - år 2001 og 2002</th>
</tr>
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<tbody>
<tr>
<td>4 Laboratoriesvar</td>
<td>RPT01</td>
</tr>
<tr>
<td>6 Mikrobiologisvar</td>
<td>RPT02</td>
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<tr>
<td>5 Cervixcytologisvar</td>
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<tr>
<td>1 Billeddiag. epikrise</td>
<td>DIS05</td>
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International standards

- UN/EDIFACT
  - http://www.unece.org/trade/untdid/

- Health Level Seven
  - http://www.hl7.org

- W3C
  - http://www.w3/XML

- CEN

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2002 - 2005
MedCom IV: Internet and EPR communication

- Establish a secure IP-based network
- Large scale communication project using the network
- XML standards for communication with Electronic Healthcare Records in hospital
- SUP – Web access to information in existing hospital systems
- Communication between Homecare and Hospitals

Budget 52 mill. Dkr. = 6.9 mill. €
Systems communicating in the Danish Health Sector

18 Laboratory systems
15 GP-systems
6 Homecare systems
16 Hospital systems
3 reimbursement systems
3 Pharmacy systems
More than 25 other systems

Communicating more than 60 different types of messages

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Number of messages / month

- 5000 doctors, pharmacies, municipalities and hospitals
- 60 IT vendors
- 4,1 mill. messages each month
- 15% growth/year
- 70 - 90% of all documents
MedCom and www.sundhed.dk
EU Commission’s Initiatives

- Accelerating The Development of the eHealth Market in Europe (2007)
- Commission’s Recommandation on Crossborder Interoperability (2008)
- Large Scale Pilot on Interoperability epSOS and Calliope
The Baltic Healthcare Network
EU Project Participation

- epSOS: – LSP for transborder interoperability
- Calliope: - Tematic Network fot Interoperability
- 4 Projects on Telecare
- 4 Projects on eInclusion, ”Aging Well” and Ass. Amb. Living
4. Secure Communication
The principle behind the technical infrastructure

- Connecting existing secure networks with Virtual Private Network (VPN) to a central node.
- Using existing internet connections and not disrupt the EDIFACT communication
- The “central node” adjusted to the existing network – reuse of network structure and equipment
- A central connection agreement system that takes care of the control of the connections between the participants.
How do we secure the data

Three level of ”access” on the Danish Health Data Network:

1. **VPN network:**
   Everyone gets access to nothing!

2. **The Connection Agreement System:**
   Select IP addresses get access to select services (IP addresses)

3. **User control:**
   Chosen users get access to select services and there is a manual and local user control.
BEFORE: Safe and secure networks – but not connected!
NOW: Secure VPN connections between existing (secure) networks
1: VPN connection
2: IP Agreement

2: IP Agreement

www.amt-opslag.medcom
3: Login and password / Digital signature (PKI)
Why is this a smart solution?

- Creates a common security level and increases the total security.
- The solution is very flexible: it is possible to connect all kinds of secure networks - from a single GP surgery to whole regions. From 2 MB ADSL to 1 GB fixed connections.
- The network can be expanded when the needs are there – you do not have to “boil the ocean”.
- Cost efficient - the construction costs were about 350.000€ and the annual running costs about 400.000€.
- Makes it easy to connect to international partners or even to other national or regional health networks.
Results of the Internet project

• Today, more than 70 organisations within healthcare is connected to the IP-based Health Data network:
  – All hospitals
  – All pharmacies
  – All GPs
  – All municipalities (homecare, preschool care)
  – A large number of private hospitals and IT vendors
• Today there are more than 1600 agreements in the system - each one replacing a point to point VPN connection
• Services on the Health Data Network today is:
  – Laboratory results
  – Online access to RIS and PACS
  – Video conferencing
  – Online access to patient data across regions (The SUP project)
• Connections to Norway, Sweden and two Baltic hospitals through the Baltic eHealth project.
• Backbone for the national eHealth portal for citizens Sundhed.dk
Lessons Learned 1.

– Start with the basic needs
– Make consensus projects
  – Get Users, IT industry and health authorities unite!
– MedCom Good Profiles is a good thing!
  – Off-the-shelf products
  – All-to-all communication
– Dissemination projects necessary
– Make it simple, stupid!
– Keep track: Things takes time
Lessons Learned 2.

- Implementations need to be initiated
- Realistic Budget including training
- Change Management
- User Involvement
- No isolated information islands
- Follow Standards
Any questions?

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