Reference models:
A Healthcare Case Study
The Norwegian Healthcare Authority in the South Eastern Region (Helse Sør-Øst) is sponsoring the development of a Healthcare Reference Framework. This reference model is a prerequisite for healthcare reform in the region and uses best practices and learning gleaned from industry reference models, such as those developed by the Telecommunications, Natural Resources, Supply Chain Council and other industries.

The presentation will focus on the Healthcare vision and business motivation driving the development and adoption of industry reference models. The business case for increased South African participation will be presented.

Sarina Viljoen is collaborating with the Norwegian Helse Sør-Øst Healthcare Authority to develop this model, using her background as the forum director of The Open Group's Exploration Mining, Metals and Minerals forum (EMMMv).
Agenda

- Background
- Healthcare in Norway
- Reference models
Norway

- Population: 5 Million
- Land boundaries: 2,542 km
  - Sweden
  - Finland
  - Russia
- Coastline: 83,281 km

- **Area of Norway**: 385,252 km²
  - (South Africa measures **1,221,037 km²**)
Healthcare in Norway

Overview of the Norwegian health care system

Philosophy
- Equal and free access for all to high quality healthcare services

Financing
- Mostly publicly financed (~85%) and tax based
- Total public spending on healthcare is around USD 35 billion

Responsible authority
- Split between state (4 regional health authorities) and municipalities (431)
  - Primary care: Municipalities
  - Long-term care: Municipalities
  - Secondary (specialist) somatic care: State (health regions)
  - Psychiatry: State (health regions)

Private player climate
- Very low share of private provision, except in primary care
- Most players operate as private providers within the public system
- General reluctance to further privatization of healthcare

Population: ~4.9 million
- 14.6% over 65 years
- ~1.2% annual growth

Source: McKinsey analysis
Geography, cities and healthcare

- Geographic – 1 central governance (the directorate)/ 4 regional healthcare enterprises/ 50+ hospitals (secondary healthcare)
- 450+ municipalities (primary healthcare) / 3000+ GP offices
- Governing and decision making within the geography
  - Own resources
  - Right to decide
Healthcare reform

- The status quo: 20+ years resulted in no standard processes (except sup-optimal processes within companies) and many thousand applications and information islands (HSØ have between 2900 and 3500 applications)
  - Subsequent is also the lack of standardization and systematic work on the information structures itself...

- Regulations and privacy laws have clinical information belonging to the individual organizations and must be protected there
Healthcare reform

**Vision:** High quality health services equal to all, regardless of age, place of residence, ethnic background, gender or personal economy.

**Drivers:**
- Citizen response/ demand
- Political focus
- Patient safety
- Quality of care
- Alignment to best in class
Key figures 2011

- **Somatikk**: The South-Eastern treats more patients than ever before.
- **Psykisk helsevern**: Number of patients referred for treatment in mental health care levels off.
- **Rusbehandling**: Several have outpatient and inpatient treatment, and the waiting time goes down.
- **Ventetider**: Shorter waiting times in general medicine, TSB and mental health care.
- **Fristbrudd**: Percentage of deadline violations of rights patients lose.
- **Korridorpasienter**: Almost no corridor patients in mental health care, but the increase in somaticimproved.
- **Kvalitet**: Work on quality and patient safety.
- **Samhandling**: Interaction reform is well underway, 175 agreements with municipalities / districts.
- **Private**: Buyer year for 3.5 billion from private institutions.
- **Forskning**: Research for 1.7 billion. Over 150 new projects.
- **IKT**: Developing common regional release.
- **Innkjøp**: Large corporate citizen who buys for society.
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Developing a Reference model for Healthcare

Roar Engen
Chief Enterprise Architect at Helse Sør-Øst RHF
Oslo Area, Norway | Hospital & Health Care

• Enterprise Architecture focus since 2009/10
• 139 TOGAF trained individuals in Healthcare alone
• Understanding the need for a common reference within Norway
• No context reference model work found.

Current: Chief Enterprise Architect at Helse Sør-Øst RHF
Past: Senior Advisor at Helse Sør-Øst RHF
CEO and Founder at AOS Consulting Ltd
Senior Advisor and IT/IS Architect at NordicAware AS
Industry Reference frameworks

- Exploration, Mining, Metals and minerals (EMMMv)
- Information & Communications Technology (TMF with Frameworx)
- Supply Chain (SCORE)
- Retail (ARTS)
- Oil & Gas (PCATS)
- Financial Institution (CIM)
Information and Telecommunications Industry (tmforum - Frameworx)

Frameworx
- Frameworx Overview
- Frameworx Quick Start Library
- Business Process Framework (eTOM)
- Information Framework (SID)
- Application Framework (TAM)
- Integration Framework
- Business Metrics

Frameworx Implementation Support
- Frameworx Implementation Support
- Frameworx Conformance Certification
- Business Benchmarking
- Business Metrics Automation Certification
- Training & Certification

Best Practices
- Procurement
- Revenue Assurance
- Service Level Agreement Management
- Software Enabled Services Management
- IPsphere

Frameworx 11.5
Suite of standards that enable successful business transformation

Latest Downloads
Select the standard you would like to download.
- Application Framework (TAM) 4.5
- Business Process Framework (eTOM) 9.0
- Business Process Framework (eTOM) 11.5 beta
- Information Framework (SID) 9.5
- Integration Framework 2.5
- Integration Framework 11.5 beta
- Revenue Assurance Solution Suite 3.0
- Revenue Assurance Solution Suite 3.5 beta
- Business Performance Measurement System (BPMS 5.5.0)
The Association for Retail Technology Standards (ARTS)

The Association for Retail Technology Standards (ARTS) of the National Retail Federation is an international membership organization dedicated to reducing the costs of technology through standards. Since 1993, ARTS has been delivering application standards exclusively to the retail industry. ARTS has four standards: The Standard Relational Data Model, UnifiedPOS, XML, and the Standard RFPs (in partnership with NRF). Membership is open to all members of the international technology community—retailers from all industry segments, application developers and hardware companies.
The intent of industry frameworks

- To provide an “example”/ typical industry answer for the questions the organisation in the industry faces:

  - **What** information do we need
  - **How** does it all hang together
  - **Where** will it have an impact/ be used
  - **How** are we serving customers/ delivery products/ transforming inputs into outputs
  - **What** do we need to do
  - **When** does it need to be done
  - **Who** will do it
  - and **Why** are we doing it
Common themes in the reference frameworks

- They all seem to focus on the following elements
  - Business Process
  - Information/Data
  - maybe Business Capability
  - invariably application and/or service component included
  - ...and aspects of integration or flow
Objectives of Healthcare Reference Framework

- To **educate** on what we do, how and where we do it and why
- To **improve communication**; focusing the conversion
- To define **scope** and **context**; for planning and conversion
  - To support strategy development
- To create clear lines for roles and responsibilities
- To create **standards** for the concepts defined in the framework
- To allow for the **comparison** of things
- To enable **re-use** across programmes/ projects and organisations
- To support a common/ **balanced view** of applying our resources and effort
- To **focus** our resources on areas of differentiation
- To **better utilise** our data through understanding scope, context and positioning
- To **align** objectives of the various divisions of the organisation (IT, Business)
Use of the Business Process Framework

1.1. The Business Process Framework as a focus for enterprise mapping

Now, alongside this use of the Business Process Framework as the basis for defining process decomposition, it has also been commonly used as the default starting point for analyzing and mapping how the Business Process Framework process elements relate to the relevant area of application. For example, a company may look to map the Business Process Framework into its business and may therefore want to identify departmental roles and boundaries using the Business Process Framework as a tool in this.

It is an important, but possibly subtle, point that alignment with the Business Process Framework depends on adopting and using the individual process elements within the Business Process Framework but that this does not mandate that these must be kept in the arrangement shown in Figure 1. In other words, the key requirement for staying aligned with the Business Process Framework is aligning with individual process definitions (as set out in GB921D and the related model, etc) rather than
Using the Framework to create a common understanding of my organisation and the scope of processes we perform.
Health Reference Framework (HRF): Enabling transformation

- Some background:
  - Project "klinisk dokumentasjon" identified the need for a better understanding of where in the hospital and how the clinical information will be used.
  - In the same project we realized that there is no model or visualization of the businesses (helseforetak), and one was created as a communication tool (the "house").
  - We have been working with the hospital in Østfold to understand and describe how "Industrial IT" fits in to a "helseforetak" context – findings...
  - We have searched for other healthcare reference frameworks – findings???
  - There is high awareness on applications, infrastructure and lack of IT resources – where is the business focus and business structure?
  - What (and how) do we communicate with the business leaders without context?
HRF Vision

- Defining the common language (definition) regarding the information required, managed, and reported on.
- Defining the common definition of our business including the business areas with specific functions and processes.
- Defining the basis for the existence of application in the organisation.
- Defining a common definition of the metrics to be used to measure performance.
Business reference model

Objective: To provide a common definition of the business elements that will enable the transformation of the structure, to achieve our defined strategy and deliver the desired outcomes (i.e. performance)

Proposed Elements: Business Area, Function, Process, Role
Business Reference model v 00 02

Input: Patient Identity
Input: Problem Description
Input: Hypothesis
Input: Clinical Investigation Results

Output: Treatment Options
Output: Qualitative Plan
Output: Risk Assessment
Output: Diagnosis
Output: Capacity and Cost Analysis

Input: Patient Identity
Output: Guidance Advice
Output: Individual Plan
Output: Rehabilitation Plan
Output: Discharge Letter
Output: Value Compass

Input: Patient Identity
Input: Clinical Scores
Input: Treatment Plan
Input: Treatment Location

Output: Procedural Related Investigation
Output: Treatment Metrics
Output: Side Effects
Output: Rehabilitation Plan
Output: Procedure Codes
Output: Complication Details

Access Healthcare
Assess the Problem
Assess Patient Requirement
Treat the Patient
Close and Followup

Input: Patient Identity
Input: Healthcare Caregiver Info
Input: Availability of Care
Output: Vital Statistics
Output: Referral Information
In/Output: Symptoms

Input: Patient Identity
Input: Vital Statistics
Input: Referral Information
Input: Value Compass
Input: Symptoms
Input: Medication
Input: Treatments

Output: Problem Description
Information Map

Objective: To enable information sharing and reuse across the Healthcare sector in Norway via the standard description and discovery of common information and the promotion of uniform information management practices

Elements: Information categories, Information Elements, Information Owners
Existing standards for Healthcare (information exchange)
## Existing standards for Healthcare (information exchange)

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<th>Krav</th>
<th>Innholdstandard</th>
<th>Format</th>
<th>Informasjonstomene</th>
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Application reference model

Objective: To categorise and define a common definition of the application capability required, where the application is a combination of the process executed and the data delivered.

Elements: Application Categories, Application Functionality
Fig. 2. Detailed reference model of the Applic

Fig. 3 Industry modified model for Healthcare – domain level, 2010.
Performance reference model

Objective: To categorise and define a common model for defining the business metrics to be used for determining organisational performance.

Elements: Measurement Category, Measure
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Before changing treatment center talk to your doctor or call a patient advisor on 800 41 004
Pasientrådgiverelefonen is open weekdays from 8:00 to 3:00 p.m..
Summary waiting times
How to choose or change
Performance Reference Model (PRM) has a four level hierarchy (Measurement Area, Measurement Category, Generic Measurement Indicator, and Operational Measurement) as shown below.
Reference models

- Collaboration and co-opetition are the key words
- With South Africa debating national healthcare, a reference framework to enable the conversation and eventually interoperability will be fundamental
- Healthcare, hospital and medical aid organisations and their suppliers should start considering the extended enterprise in a new world with national health
- Consider joining a South African collaboration on the topic
- Contact me for more detail
Contact

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