Architecture is not only for architects. For an architecture to be properly implemented, a variety of stakeholders must be informed about the architecture and its roadmap. At Statoil, we have used the corporate management system to reach out to architecture stakeholders, and in this session, we take a look at how this is done and the lessons we have learned from this process. We also take a look at future plans for improving the management system, and how this influences architecture communication. Our key focus area for future improvements is based on personalization, as well as how best to deliver the right content to the right recipient. Additionally, we also plan to look at how integration between the corporate management system and the architecture governance and communication can be improved.
Who we are

- Energy company present in 34 countries with 20,000 employees
- Producing 1.95 million barrel of oil equivalent (boe) per day
- About 22 billion boe in proven resources (5.6 billion as booked reserves)
- One of the world’s largest net sellers of crude oil
- The world’s largest operator in waters deeper than 100 metres
- World leader in carbon capture and storage
- The second largest exporter of gas to Europe
Statoil's legacy is the large structures found on the Norwegian continental shelf. Featuring some of the largest man-made mobile constructions in the world (Troll, 656 thousand tonnes) we operate under the harsh weather conditions of the North Atlantic year round.
These installations are complex, so operating and maintaining them are demanding. Thus we have developed a corporate governance system, called The Management System. This consists of a set of tools for describing requirements and best practices, handling dispensations and performing audits. The management system is valid corporate wide, also within the IT organisation.
The core of the management system is shown here. It consists of the Statoil Book, the functional requirements and the business area requirements.

The Statoil book is our the basis for all our operations and contains:
1. Our values and what they mean: Courageous, Open, Hands-On and Caring
2. People and leadership: What is expected of our employees and our leaders
3. Our operating model: What are our organizational principles, their responsibilities and so on
4. Corporate policies: Key policies around HSE, ethics, social responsibility and so on
5. Function requirements: The key common requirements that apply to a functional area
6. Business area requirements: Describes the operation, management and control for each business area
The functional requirements are assigned to a set of process owners that are responsible for the definition of best practices within their process areas corporate wide.

The line is responsible for operating according to the processes.
The process owners have a set of responsibilities, including maintaining the architecture for their own process area.
Statoil has chosen the federated architecture approach.

Drilling, Plant Operations etc. are process areas. DPN, DPI etc are organizational units.

Process owners for the different process areas are responsible for the architecture within their area. Corporate staffs maintain the corporate architecture established to show the most important processes, information carries and applications within each area. Each process owner is then free to extend their architecture model according to their own needs, thus giving us architectures of various comprehensiveness-

The different business areas are impacted by the process areas differently.

DPI = Development and Production International  
DPN = Development and Production Norway  
TPD = Technology and Project Development  
MPR = Marketing, Processing and Refining
These are the processes owned by the process owner for information technology. One of the processes is Manage Architecture, which is part of the IT governance processes.

The Demand process is primarily carried out in the business areas to specify IT demands, while the Supply process is mainly carried out in the shared service provider organization to satisfy IT demands.
One of the responsibilities of process owner IT is to maintain the technological direction on behalf of the company. This has a process involving key stakeholders.
This is an example of a workflow within the Manage Architecture processes. There are several different stakeholders participating in the process, and it starts based on various events elsewhere in the business architecture. The end events lead to other processes being started.
Information systems and technologies are maintained in the management systems and is shown with lifecycle and with various reports.
We have achieved a number of things over the past 5 years within architecture management:

- Reduced number of technologies (significant savings, 10s of millions of dollars per year).

- Reduced number of applications (from 4000+ to approx 2000) in usage as well as consolidation of usage

- Common view of best practices
Technical debt is the future spending on IT as a result of decisions made today. Our efforts has significantly reduced the technical debt in the form of licensing costs, upgrade costs and organizational size.

Example: Database operations.
Standardized on Oracle and SQL Server.
3 people operate and maintain the Oracle servers, 3 people operate and maintain the SQL Servers
We have (per April 2011) 1700 Oracle DBs across 150 servers and 6000 SQL Server DBs across 450 servers
10-fold growth in DB need over the past 10 years, keep growing by 25-30% per year. No need for increased personnel.

A significant of standardization in software architecture had to take place for this to be possible: Integration mechanisms, PL/SQL usage, deployment patterns and more… This was communicated
We see that commodity IT is currently becoming a first order production asset. 5-10 years ago, many processes could function without IT systems. They were not as efficient, but nobody really cared when I took down all PCs on an installation as part of a routine upgrade back in 1995. Then, commodity IT was used for administrative purposes and could easily be non-functional for a couple of days…

Today there are very few, if any at all, of our processes that function without IT support and commodity IT solutions. Thus we have to approach IT in the same manner as our operational processes, as loss of IT service puts lives in danger and could bring down an asset. An example of this is the Stuxnet worm that attacked SCADA/safety and automation systems running on Windows servers.
It is difficult to find the right requirements, as they are spread around many documents. The form can also be difficult to understand, as they are often written by nerds.
Statoil is intending to become a global player. We have identified four areas of particular interest, and these are not very similar to the current Norwegian continentalt shelf...
The basis for the management system is the Statoil book and more described in slide 5.

On top of the management system we build the business processes as the foundation of all content. We use the organisation to organize people and the processes to organize work.

The two forms of capital (structural and human) work together to ensure that the work described in the business processes is carried out by the right people with the right competence using the right information provided by the right application on a set of sustainable technology platforms.

For an end user, access to content is provided through portal of personalized content. Thus, the content which is needed is easily available, but the full content is available if needed.
When I enter the management system as myself, I get documents and requirements related to me and my position.
When I change «context» I get documents and requirements related to someone else, as shown in this example where I look at it from a canadian perspective.
As we encompass a more diverse business portfolio, the amount of common requirements will change. We will see much more addendums (additions to common requirements) and substitutions (where common requirements are substituted by local requirements). It is for instance no use in having a lifeboat on an installation in the middle of the Sahara desert, or requiring winter hardhats for Brazil operations in December.
Also within IT we see the same. This is an example of the SAP BPM and SOA architecture, and this architecture has its requirements and best practices.
This is the BPM and SOA architecture for OpenLink Endur. This has a different set of requirements and best practices.

Although not «location»-based differentiation, the context is different for SAP and Endur, and we want to publish a different set of requirements for each eco-system.
Part of the new management system capabilities is the ability to assign requirements directly onto individual activities in the workflow. Thus, instead of massive documents with lists of requirements, we are now able to assemble short requirements and attach them to the right activity.

This also simplifies the requirements management, as we can maintain the same corporate requirement that satisfies many external requirements. Whenever we have an external audit we assemble the relevant external requirements and can map these to the right corporate requirements and activities that fulfill these requirements.

R-xxxxxx are requirements (with a universal ID). These have to be followed or a dispensation applied for. Dispensations are approved by the process owner staffs.

M-xxxxxx are methods/best practices. These are recommendations, but one may choose to do something different (at your own peril).
The first phases of a business support project with a common set of requirements
This is the typical deployment scenario that the common requirement around latency and bandwidth describes. We want all applications to be deployable in such a scenario.
For particular application eco-systems we can maintain local substitutions and best practices that apply only to that particular eco-system.
This is the typical deployment scenario that the local requirement around latency and bandwidth describes. This deployment scenario is applicable in a few ecosystems within our subsurface area, due to the massive data volumes and intense end-user interaction required for the applications to function as intended.
As an end user, I do not have to care very much about the structuring of requirements. I get my content easily available in a portal for consumption.

My processes are the processes where I have a role
My architecture is the architecture associated with those processes and where I have a role
My requirements is an extract of the requirements related to the processes and architectures where I have a role.

The relation between persons, positions, roles and architectures are maintained in the metamodel and populated from the corporate HR system.

The portal is built in the ARIS tool suite (ARIS Business Publisher for the Portal, Designer for the content).
Summary

The management system has enabled reduction in portfolio diversity and brought portfolios under control through better communication of corporate architecture standards.

Personalization communicates architectures and requirements for specific stakeholder groups more effectively.

There are more components of the management system that we have not covered, such as the handling of dispensations, audit management and more. Together they form a corporate governance system that can be utilized to communicate architecture requirements, best practices, handle deviations and audits to ensure that the architecture is developing in the fashion we desire.
Questions?

Thank you!

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