

NATIONAL IT ARCHITECTURE FRAMEWORK – THE DANISH CASE

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Ladies and Gentlemen, it is a pleasure for me to have this opportunity to make this presentation of the Danish approach to e-government and enterprise, enterprise architecture. I am Head of IT Strategic Division which is based in National IT and Telecom Agency under the Ministry of Science Technology and Innovation. The IT Strategy Division is a recently established division in the agency responsible for defining and devolving a national enterprise architecture framework, defining a model structure and a system for public data in Denmark, and responsible for common regulation of the public use of IT in Denmark. Besides this, we are also becoming the state knowledge centre in the following areas: IT architecture, public data, metadata and XML and e-inclusion. The logic behind the establishment of the IT division is simple.

E-Government in general is largely a matter of getting public sector IT systems geared to interoperability. The pace and nationwide spread of interoperable IT systems in government is likely to be very uneven if there is not a facilitator or catalyst. Some of the barriers are technical, many are not; facilitating the removal and catalyzing change is a role of the IT Strategic Division. Denmark has a national project called Project e-Government. It is a common project between state councils and local sources and the task of the project is to promote e-Government across the public sector, among other things, but partly or fully removing technological barriers. We set conditions for Denmark being able to offer coherent public service to citizens and companies that various systems that provide these services should be coherent. E-government cannot be realized unless public sector IT systems are geared to work with each other. Among other things e-Government is about giving the authorities the capability of using each other's data, so that citizens, companies and case officers do not have to provide and check the same information over and over again. In this respect we consider enterprise architecture a key and a catalyst for the realization of the Danish e-Government Division.

The situation today, first looking at IT services to the citizens. The white paper is based on four cornerstones for e-Government formulated by the Board of Project e-Government in Denmark. One is that e-Government should equip citizens and companies for the network community. Two, the public sector should work and communicate digitally. Three, public sector services should be delivered coherently with citizens and companies at the centre and, four, public sector work should be carried out where it is handled best.

These direction markers can be translated into processes that will run over several years with different content and development logic. The slide attempts to illustrate the correlation between these direction markers and the maturing of e-Government.

Next is a picture from the Real World in Denmark. We often say that our systems are not integrated. We call them monolithic and isolated items that do not share data where it is possible.

Each system is just an automation of a well-defined process. This picture is from a Danish county in the Department for Environment Technology. Every system has its own user interface, its own database, own verification of users and you can go on. As you can see, it is not a simple process to move from this picture to an integrated and coherent system. You cannot make them move in one step, I think we have nearly the same idea as the Canadian (John Weigelt) who talked about having to go through a step called adaptation, where at the beginning you use adaptation as a stage to connect these monolithic systems.

Next slide shows the IT strategic goals and the direction and coherence between ripeness on the one-hand and time on the other hand. Again, you have a picture showing that even if you have the will to achieve a point called, carry out the job at the best place, then you need to meet some pre-conditions before you can go there. Our experience in Denmark is also that we have players and projects across the whole ripeness spectrum, and be awareness ripeness includes many things. It is known, not only a question of technology and political decisions. Ripeness is about the organisational set up. E-Government will work as a catalyst on processes in the organisation and the human in the organisation. Integrated and coherent service result in and are based on changing working processes. You must take into account and involved the whole context around the public enterprise, including private companies. And you need a clear picture of where you are, how well your present IT system meet needs, and what are the things that you are aiming for, and how will your teams impact your surroundings including other players.

Town planning is a well-known analogy or picture of the planning process for IT solutions. You cannot imagine town planning and town administration without architects, technicians and strict documentation of the infrastructure, and you cannot imagine town planning and town administration without rules, standards and regulations. First and foremost town planning involves establishing rules for given properties, location and layout for example, standardisation, certification, management and town planning also includes principles for the common services to which a property can or must be connected. For example, water, telephone, cable TV and so on. The establishment of services is a common investment and the use of these services is regulated to achieve acceptable profitability, but the reality about our existing IT system is, that we have a situation where these basic needs are not fulfilled.

Another picture, I think all of you have heard about Zackman. Zackman is nearly a synonym with the concept of enterprise architecture. This Zackman's framework is based on needs and experience in the airline industry. And what's the characteristic in airline and flight production and flight administration. Airlines and flight is very complicated. You have thousands or millions of units in an aircraft. The function for each unit and each relation between an individual unit and other units are very important and unique. And if one fails, you need to have a quick answer with respect to the implications. It is not possible for a human to have this overview, and because of that IT architecture is a widely used and well-known discipline in the airline industry. Digital administration has a lot in common with the airline industry and digital administration has a lot in common with town planning. E-government is a very big and complex thing. There are a lot of interdependencies and relations and definitions you need to know and processes you must control if you want coherent and interoperable IT solutions. Architecture is a bridge between business and technology. It is the translation mechanism by which business needs are translated into technical solutions. Architecture provides two things that are critical to the success of the business administration. A mechanism by which the business can express its needs to the technologists, who in turn can provide a means of meeting those needs, and an unambiguous alignment of technology solution with business goals.

So our opinion in Denmark is that using IT architecture is the only logical answer if you want to manage the way you use computer technology in your business and if you want complex systems to fit together.

Now the picture here is not a town, but a sort of diagram of IT solutions and their connections. If you build systems without thinking of relations, dependencies, standards, operating systems and data, then you have the top picture. And integration is expensive. It is difficult to make the systems interoperable and to top it all you will probably have systems with a poor performance, but remember our starting point when we build our new system is a situation like in the top of the slide. Only very few existing systems are born and designed to be actors in a complex system. The picture in the bottom shows how we are using architecture to design and build our new system, a simplified structure using standard interface and built to be a part of a service oriented complex hole is our vision for the future.

Next I want to go into more detail with respect to the existing architecture. First the picture of the system, tailor-made solutions developed for isolated business processes. Every entity has a unique system, the advantage is that you have autonomy in each public authority and these advantages are: data islands, redundancy, no recycling or joint functionality, each system requires specific competencies. This picture shows the system in the public administration built and used solely by the administration; we call them our legacy systems. I hope you still remember some of my first foils, where I showed the visionary process affecting IT solutions. Here we have the picture at a very early stage.

Next is the process where the public services are being made available for the citizen. We call them in Denmark, the first generation of digital service to the citizen. They are often only making automation of existing processes and making available to see on digital equipment what was possible only on paper,

Here is a picture, it is not computer, it is like you can see, railway and a train. Train and railway systems, as we know them, from the beginning of the technological revolution. In the beginning there were many different railway companies with their own tracks and ticketing systems. The customer had to plan his or her own journey with several trains and purchase tickets at various ticket counters. That is very similar to our system, or base IT position before beginning to architect our IT solution. Next step is what we called service-orientated architecture. I think, in the terms used by John Weigelt, it is the adaptation face we are talking about here.

In Denmark, we have agreed on five principles for IT solution and IT architecture in the public sector. A common public sector framework for enterprise architecture must first and foremost incorporate the five principles as you see on the slide. I will not go deeply into this, I do not have the time for it. And just back to this picture of the railways system, as you see as service oriented architecture or a picture of it used in railway terms, shows a situation where it is now possible for the customer to make a reservation and buy tickets at one place. Information society, or as the first speaker today called it, knowledge society, I think it is more correct word of what we are going into. Demand of public sector IT architecture. The picture shows a common playing field or one user interface to a complex set of general rule based components. Connecting these components in different ways give different functionality. The same generic service is only developed one time, but used in many ways. Similar functions implemented in generic rule based components gives benefits: a better, easier and more coherent service. The combined system is smaller than today. The task of collecting and processing redundant data is eliminated. This system is independent of the public authorities organisational structures and portfolios, and the picture show in a simple way, why architecting, service orientation, standards, rules and regulations will provide a lot of benefit. But it does not show how we do it. And again, back to the railway system, in this last picture ticketing systems and rails are made available to a multitude of companies. New trains and new ticket offering can be launched without laying down new rails. Our challenge is that what has been taken more than 100 years in the railway sector, we want and we may do in the public administrations in the next couple of years. Architecture is not about technology. This is the heading from an article from Gartner Group. In my opinion, it is not the whole truth to say that architecture is not about technology but the reason why I use it here is to underline that enterprise architecture is not primarily about technology.

Architecture is, as I have said before, the bridge between business and technology. It is the translation and transformation mechanism between business and technology. The picture serves to show the change from the past before enterprise architecture to the future, after taking enterprise architecture in use. In the past, business had a need: IT was employed to solve it but after a short time the IT itself was often in focus. In the future, using architecture will emphasise that business needs should be in focus most of the time. The business management should be the driver, and steering part in the process.

The e-Government organisation and process in Denmark – I will try to explain it. The task to promote e-Government across the public sector is rooted in what we call Project e-Government which has participation from public authorities in central and local government. Project e-Government is a major project including a lot of activities. A large project with a focus of building a new IT solution based on legacy systems in selected domains is an example. Political initiatives spreading knowledge to make the public sector more cost effective using IT is another example. In the ministry, we have formed a programme called the Danish IT Architecture programme, it is what is called DITA. The programme is based on IT strategic office, the Danish architecture committee, the Danish XML committee, and our international collaboration. The DITA programme has three central components: the data, the architecture and the security component. Later on in this conference, you will hear there are special sessions that will go more deeply into the data and the security components.

We have in Denmark a white paper on enterprise architecture. We have a Danish architecture committee, and the next step is achieving the common methodology and choices in a handbook on enterprise architecture. So called “how to do it” book. The handbook will go into a hearing here soon and we also want a hearing at the international level, so if some of you are interested we will be glad to send it to you and have your comments. The handbook will be available in a few weeks in English. This Monday morning we finished the first draft and that was in combined Danish and English but in a few weeks we will have a Danish version and also an English version.

Facilitating is a method used to the Danish e-Government policy. We have a need of regulation but not regulation in the old way by central legislation. The facilitation can take form of collaboration, demonstration, public private partnerships, advisory boards and the like. And the handbook I have told you about is an example of such a facilitation who have produced a handbook of enterprise architecture in a collaborative process where around ten of the biggest IT vendors in Denmark, including IBM, Microsoft, Sub-Denmark just to mention a few.

Now some advertisement regarding what has been accomplished in Denmark. Ripeness of e-Government I think it is the same way as has been talked about earlier and from the speakers before me, I now understand why we are not in the first position but what I want to underline here is that Denmark has, this is away from this year, has moved in one year from place number ten to place number four, and that is what we are very proud of. As you have heard from Singapore and Canada, and you can see it here, they are in the first and second position. Another advertisement for Denmark, this concerns public sector computerisation. As you can see Denmark ranks number one among the EU countries, and we are aware of the fact that this only measures the amount of money, and says nothing about the quality in the computerisation.

Next is information society index from 2001. Again Denmark is rated in the top league among other EU countries.

Non-technical challenges. Knowledge is one of them. The challenge here is that architecture is not broadly understood, consistent approach spanning authorities is required and we have a lot of initiatives addressing this point. Standardization: in the DITA project, we already have a lot of standardization and of course also battles, and as we do not use legislative regulation but primarily use facilitation, we try to find solutions using collaboration and consensus. Financial:

the infrastructure project funding will be a showstopper if it is not resolved. It is a problem and we don't have a silver bullet for that. Organisation and culture: departmental autonomy must give way to the public interest. This is a challenge – you need to have a consistent and coherent way of thinking across organisation and normal business life. We are working with, and also participating in demonstration projects founded by the product e-Government. Legislation: at this point we are only in the beginning phase and we don't yet have a clear picture of what form regulation will take in the future.

Strategic choices in the sphere of the enterprise architecture framework we have made, and will continue to face a lot of strategic choices and decisions. One choice is a common service orientated architecture framework. We have decided upon this as a strategic set-up. As I have shown you earlier in this presentation, we go step by step and, as we have heard also from Canada, domain by domain.

Standardisation in a changing world. True experience and knowledge in the area we know that the most stable thing is the data. Because of that a data model is really important and we are working really hard at it. In our experience, schema standards are stable for a short period but is still worth trying to develop these. Protocols and acronyms are, as all of us know, ever changing. In Denmark we have decided to use XML and TCP as protocols but we are trying to build our system without dependencies on these ever changing items. Instead, we try to build on guiding principles for the architecture work, building on the philosophy that if you have a documented and architected system it is not so difficult to make changes later on.

That was what I had prepared to say, our white paper is available on the site, you can see here on the slide and in a very few weeks we also have what I call the Handbook of Enterprise Architecture available in an English version. Thank you for your attention.