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In Denmark, Walls of Government Tumble Down

A Lego-like IT architecture based on data-sharing and standards helps transform a traditional, turf-based public system into a cost-effective, customer-first model.

MOST PUBLIC-SECTOR MANAGERS RECOGNIZE THAT EFFECTIVE E-GOVERNMENT requires both technical and organizational collaboration. Yet until recently, Denmark's e-government rollout was a classic "improve-the-silo" story, in effect duplicating traditional government business processes. Consequently, almost 40 percent of Danish municipalities say, the lack of application integration was the biggest barrier to maximizing use of IT in service delivery.

Now, however, Denmark is finalizing deployment of a nationwide, service-oriented IT architecture to facilitate breakdown of barriers to collaboration, serving up a model for other public agencies aiming to improve decentralized delivery of government-to-consumer services while stimulating government-to-government and government-to-business collaboration.

Efficient data exchange and functional integration lie at the heart of these revitalizing advancements, and IT architecture provides the business-reengineering framework. Back-office improvements in public agencies are being prioritized to reap fast and significant efficiency gains. In addition to high-level government commitment, key components of the new architecture emphasize pragmatic, gradual rollout, across agencies and IT platforms.

"The goal is that investments will be based on government-wide, service-oriented IT architecture," says John Gøtze, e-government coordinator for the country's National IT and Telecom Agency.

Top Priorities

Thanks to two initiatives at the core of the Danish approach—implementation of XML (Extensible Markup Language, essentially code that supports data-sharing between online applications) as the communication standard and deployment of a digital signature (an advanced form of cryptography, for privacy protection)—the country's e-government is well under way. In fact, automation of routine administrative tasks has already resulted in 30 to 40 percent savings.

But administrative cost reduction is the smallest part of the story. The real achievement here is freeing up government resources to better service complex cases.

The improved government services also provide the private sector tremendous potential to better serve its customers. Mikkel Hemmingsen, deputy director, National IT and Telecom Agency, predicts banks and insurance companies will be prime players because they'll benefit by providing their clients direct access to tax and other personalized information.

"We will see many new bold and daring projects in the near future that will change our interaction with the authorities significantly," says Mikael Matzen, enterprise account manager, Microsoft. "Some will be initiated by private companies that see a business model in providing digital services to the public sector."

The Lego Strategy

Denmark's approach to technological and organizational collaboration is reminiscent of the Danish toy producer Lego's construction kits: Each block comprises a technical solution and adheres to minimum standards (XML schemas), yet an overall construction plan is needed to create the ultimate product or service (a nationwide IT-architecture framework). Lego-like flexibility allows room for strict adherence to plans as well as free-form development. The government, like Lego, provides blocks and a road map. Others do the decentralized construction.

XML is often used to fill in gaps, increasingly allowing a component-based multi-vendor approach to IT projects. The government specifies project needs, facilitates standardization, provides seed money and lets the market deliver the solutions through private consortia, which bear the remaining commercial risks to deliver as per contract. The government has demanded the use of open standards, so suppliers compete, distinguishing themselves through implementation.

Consequently, the relationship between the government and private suppliers is changing for the better. Instead of a silo-based lock-in after competitive bidding, the government draws on a pool of suppliers to deliver components in an open-standards environment. This reduces cost overruns and delivery shortfalls.

Over time prolific data exchange will take place almost irrespective of the policy and regulatory framework. However, the timeline can be shortened considerably by getting the policy framework right. With the enterprise approach to service delivery, Denmark is building momentum and validating the proposition that e-government improves both service and the bottom line.

Pilot Under Way

One such pilot project, being implemented by 11 municipalities under the umbrella organization Local Government Denmark (KL), has the potential to impact 800,000 Danish citizens: Employees register when they take sick leave and some of their medical costs are covered by the municipalities. The forms used to process these "sickness-benefit" claims are among the 10 most used forms in Danish companies. Like the earlier automation of Denmark's tax system (see sidebar page 33), the potential for efficiencies is impressive.

Over time, the previous process of requesting reimbursement for sick leave had evolved into a complex morass. But KL found that 80 percent of the one million cases processed annually are simple enough to be automated. These cases represent 25 percent of the total $1.7 billion equivalent in benefits distributed; the other 75 percent of medical reimbursement covers the more complex cases.

"The sooner reports regarding those ill for longer periods are received, the better," says Jens Meiland Hansen, KL project manager and a member of the XML Committee. "It allows local-level government authorities to help these people earlier and get them back to work sooner. Automation and procedural simplification will free up resources for the 20 percent that really need attention. A mere 10 percent improvement will equate to savings of [about $170million] per year."

Using XML and piggybacking on existing system elements, such as civil and company registration numbers, allows for tremendous cost savings.

More importantly, using XML will allow the sickness-benefit system to interface with systems—the wage and salary administration, business portal and citizen portal, for example—used by private companies to report data to the public. Companies can report data only once, knowing it will be reused for salary, social security and tax purposes well as social benefits such as sickness compensation. Companies are expected to save about $170 million a year.

Digital signatures will be used to verify employers' requests for sickness-benefit claims and sick-leave reports; pin codes and other security and authentication solutions will also be used.

Unleashing the Potential

Given the savings potential demonstrated above, e-government back-office collaboration is particularly attractive to municipalities under severe budget pressure. Long-term success lies in ensuring incentives that favor collaboration so enlightened self-interest—not technical specifications—becomes the key driver. "Achieving critical mass is a key objective," says KL's Hansen.

Indeed, the need is clear. An analysis of potential savings at the municipal level conducted in Denmark in 2001 pointed to 40 services, half with more than 50,000 queries annually, with particularly great efficiency and

service-improvement potential. Predominantly registration and benefit services, they are characterized by casework involving:

- Provision of information and supply of material
- Registration of data
- Information to and from third parties
- Calculations and write-ups
- Assessments and estimates
- Registration
- Physical deliveries
- Planning

Such functions lend themselves to automation or electronic support.

Broader Programs

Likewise, at the national level, numerous projects are being developed and piloted where greatest, fastest payoff is expected. For example, a streamlined central business registry (CVR) is expected to impact government-to-business considerably, just as civil registration numbers already have played a crucial role in an extensive G2B services rollout.

Together with the National IT and Telecom Agency, the Danish Customs and Tax Administration and Danish Commerce and Companies Agency are developing a coordinated G2B framework based on XML and Web services. Registered businesses can access available information based on their CVR numbers, and will be served by a common interface, automatically generated using Web services developed and maintained by the individual authorities. All the company's obligations and public services will be available on the shared service interface—the underlying public sector organizational responsibilities will be transparent to clients.

Not only are such projects expected to improve services for business and beef up the bottom line for government—they're expected to generate new markets for the private sector, increasing pressure from consumers and companies to maintain the pace of related improvements.

Security

With extensive integration of services and data flow, security and confidentiality will become increasingly important. So too will the need for legal equivalence between online and offline case-handling. The adoption of the Electronic Signature Act is expected to meet these needs, if the public sector invests in making a security solution—digital signatures on smart cards, for example—available to all citizens.

The current assessment in Denmark is that there is a need for the public sector to actively ensure the spread of digital signatures in the years to come.

Demonstrating Value

Sustained high-level commitment and broad buy-in are needed to make these IT advances and corresponding shifts in organizational culture pay off for consumers. To that end, "benchmarking improvements in service delivery and the role data exchange plays will be crucial," says Søren Hjarup, XML project manager, Ministry of Science, Technology and Innovation.

Aside from measuring direct and indirect improvements to services and the bottom line, peer review should be complemented by proxies indicating degree of collaboration and risk and probabilities of success.

The terminology associated with IT architecture and XML can intimidate non-technical people, so if management leaves all responsibility for data exchange decisions to technical experts, its programs are doomed to fail.

Tech Talk: Denmark's E-Government

The tax system put online by the Danish government in the 1990s was an important forerunner to today's massive data exchange projects aimed at improving the country's public services. Now, more than 80 percent of all relevant information is provided electronically to the country's Tax Administration, and data processing within the Administration has been almost completely automated.

The data exchange methodology has evolved over several decades, in keeping with technological developments. However, the value of the exchange in terms of service improvements, higher precision and reduced costs has paved the way for the enormous drive to service-led data exchange. Multi-party, multi-platform collaboration requires standards for interaction.

The Danish bottom-up approach provides essential low-level infrastructure that allows distributed systems to share workloads. "Many organizations have already integrated data, primarily using electronic data interchange technology, in their supply chain management," says Mikael Matzen at Microsoft. "Functional integration is next." Complex processes are being reduced to simple tasks, which are handled by many specialized subsystems, making globally accessible implementation of services possible.

XML is proving to be a flexible and valuable tool in enabling data exchange at low cost with good scalability, so it is being pursued by all levels of government. The Danish approach to its use of tools is similar to the April 2002 U.S. Federal General Accounting Office recommendations, which include:

- A government-wide XML strategy
- Consolidation of the needs for standards
- Establishment of a registry of government data items
- Implementation through enterprise architectures

"Across all layers of government, Denmark endorsed a fundamental principle of a right of access to all but the most sensitive, personal data, which is defined by law," says Søren Hjarup at the Ministry of Science, Technology and Innovation.

The Danish government has also endorsed XML as the national communications standard for the public sector when creating multi-platform partnerships. XML supports Internet communications, simplifies reuse of existing data queries, is supported by the market and is being developed transparently. New XML interfaces are being designed, and existing systems are being upgraded for XML compatibility.

Central to the XML project are the Infostructure base, a broadly accessible nationwide data repository, and the standardizing work, which started in late 2001. Standards for data exchange between public authorities and between public and private institutions are developed in a virtual, open forum and stored in the Infostructure base.

The database facilitates adoption of XML, Web services and standards in both the public and private sectors by making it easy and transparent to develop and share data in Denmark's public databases. Developed by Microsoft and Accenture, the database contains standardized XML schemas defining common data types, such as addresses, personal IDs, company IDs and medical records, and technical specs, such as interface descriptions.

Cost recovery is a fundamental principle behind data exchange and maintenance. The prime user owns and maintains the data. Data collected or updated on request is typically user-financed, but citizens and businesses are legally entitled to free access to data about themselves. Generally, critical data such as civil and business registration numbers are priced particularly low for affordable access.

In keeping with the collaborative effort, representatives from state, counties and municipalities have formed the Coordinating Information Committee to manage XML activities and handle inquiries concerning access to public data.