

# PROBLEMS WITH NON-OPEN DATA STANDARDS IN SWEDISH MUNICIPALS

## *When Integrating and Adopting Systems*

Benneth Christiansson

*Department of Systems Analysis, Karlstad University, 651 88 Karlstad, Sweden*

Fredrik Svensson

*Redpill AB, Inova Science Park, 656 34 Karlstad, Sweden*

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Abstract: Governments world-wide are applying information and communication technology in order to meet a broad range of citizen and organizational needs. When planning systems integration the choice should lead to the software that best suits the organizational needs, taking into account price, quality, ease of use, support, reliability, security and other characteristics considered important. This paper is based on experiences from the KOMpiere project which aims at modifying the open source licensed ERP-system Compiere for use in Swedish municipals. The overall goal of the project is to support and enhance the use of open source licensed software in the Swedish public sector and thereby enable municipals to lower their IT-related costs and gain strategic control over their own IT-environment. We discovered that at least some Swedish municipals don't have free access to the data they are appointed to govern and protect. The software vendors have, by using non-open data standards, excluded the municipals from using their own data freely. Thereby denying Swedish municipals an open market. We have in this paper suggested the creation and usage of XML-based ODS for all systems in Swedish municipals.

## 1 INTRODUCTION

Governments world-wide are applying information and communication technology in order to meet a broad range of citizen and organizational needs. With a complex infrastructure of technology solutions and vendors, it is typical that government solutions incorporate a range of technologies from proprietary legacy solutions, commercial off the shelf products and open source software (OSS). When planning systems integration the choice should lead to the software that best suits the organizational needs, taking into account price, quality, ease of use, support, reliability, security and other characteristics considered important. In general, these decisions are the same for both government and industry.

In recent years, the free software and open source model has established itself as a viable alternative to other development models. Many popular products, such as Linux, Apache and

Samba, have been created according to open source practices, and the number of free software applications is increasing steadily (Michlmayr et al., 2006; Woods & Guliani, 2005). From a broader business perspective, several innovative business models and new business opportunities have emerged as a result of the OSS phenomenon, and many organizations have begun to capitalize on this. In terms of competitiveness, the OSS phenomenon has created a new service market for commercial enterprises to exploit and there are several examples whereby these companies have innovatively forged competitive advantage. Since purchase price and license fees are not a factor, OSS companies have to compete predominantly in terms of customer service (St. Laurent, 2004). Since OSS counters the trend towards proprietary monopolies, the OSS model inherently promotes competitiveness and an open market (ibid.).

Open Source Software and Open Data Standards (ODS) are getting to be more and more

accepted world wide (Drozdik et al., 2005). Managers of both private and public sectors have been attracted by the OSS with the promise of a decrease of the overall expenditures. The European Commission has published its European Interoperability Framework, which in particular includes a definition of ODS as *"An IT standard (whether OSS or not) is created to enable and facilitate the exchange of documents between different programs, program versions, operating systems and hardware platforms."* (COSPA Consortium, 2005, p. 9). We choose to extend the definition of document to include Electronic Data Interchange (EDI). With EDI we mean the transfer of data between different companies using networks, such as VANs or the Internet. As more and more companies get connected to the Internet, EDI is becoming increasingly important as an easy mechanism for companies and governments to exchange, buy, sell, and trade information (Burton, 2004). ANSI has approved a set of EDI standards known as the X12 standards.

The use of OSS does not imply that the data is stored according to an open standard. However, OSS implies access to the source-code. It is at least possible to reverse engineer the method of storage and therefore to better understand how to access the organizational data, from the source-code. This benefits and reduces the risk for future integrators or exporters of that data if they wish to be able to access, extract, extend or modify the data. This possibility does not exist with proprietary solutions.

We still believe that the OSS model leads to the creation and adoption of open standards and increased software reuse. Proprietary software companies tries actively to undermine OSS and the usage of non-open data standards is one way of doing this. When a consumer tries to change vendor they may practically be locked-in on their current ERP-system due to prohibitively high switching costs that the current vendor can demand for performing data-migration. This situation is dangerous for Swedish municipals and can lead to a situation in which the producer of the proprietary ERP-system stops to compete for new consumers and concentrates only on locked-in consumers. This results in higher prices and reduced flexibility for the locked-in municipal.

This paper is based on experiences from the KOMpiere project which aims at modifying the open source licensed ERP-system Compiere for use in Swedish municipals. Compiere is an integrated ERP- and CRM-system. (ComPiere, Inc., 2006). The overall goal of the project is to support and enhance the use of open source licensed software in the Swedish public sector and thereby enable municipals

to lower their IT-related costs and gain strategic control over their own IT-environment.

## 2 APPROACH

For this study, exploratory interviews with representatives for four municipals in the Midwest region of Sweden have been conducted in an effort to generate a requirement specification of the needed modifications to Compiere. In addition to these interviews we also collaborated with The Swedish Association of Local Authorities and Regions (SALAR). The Association strives to promote and strengthen local self-government and to create the best possible conditions for the work of their members (SALAR, 2006). The process we used was iterative with several opportunities for verification and validation of the requirements. Based on the specification we used a specially assigned development team that incorporated the new requirements into a modified version of Compiere. When problems accessing the existing non-open data standards arose we instead aimed at creating a prototype version to illustrate the benefits of a modified version of Compiere, as an OSS alternative for Swedish municipals.

## 3 CHARACTERISTICS OF OPEN DATA STANDARDS

Open Data Standards will be required to ensure interoperability for the creation of eGovernment services in Sweden. In a pan-European perspective this work is already initiated. The COSPA (Consortium for studying, evaluating, and supporting the introduction of Open Source software and Open Data Standards in the Public Administration) project studies the application advantages and drawbacks of Open Source Software and Open Data Standards in the public sector. The COSPA project aims at introducing, analyzing, and supporting the use of open systems for personal productivity and document management in European Public Administrations (Drozdik et al.). Within the COSPA project they have documented the following characteristics for ODS. These characteristics must be met for the standard to be viewed as a truly open data standard. The standard has to be adopted and maintained by a non-profit organization. Its ongoing development occurs on the basis of an open decision-making procedure accessible to all interested parties (consensus or majority decision etc.). The standard has to be published and the standard specification docu-

ment should be available either freely or at a nominal charge. Permission should be granted to everyone to copy, distribute and use it for free of charge or at a nominal fee. The intellectual property - i.e. any patents that may be involved - of (parts of) the standard should be made irrevocably available on a royalty-free basis. There should be no constraints on the re-use of the standard.

For governments and other organizations adopting ODS the benefits could convey optimized communication within and between organizations, through interoperability, simpler integration and faster integration. This could lead to more available resources, greater return on investment, more options for actors and users, improved vendor independence, broader vendor choice, lower vendor cost, higher quality, greater flexibility and possibly reduced risk.

We suggest the use of The eXtensible Markup Language (XML) to define the needed ODS. XML is not only a language for communication between humans and the Web, it is also a language for communication between systems. Rather than passing parameters, and already formatted raw data, systems can pass documents from one to another, containing not only pure data, but control information as well. Even proprietary old legacy systems written in ancient languages such as COBOL and PL/I can be adapted by means of interface reengineering to the process and to generate XML documents (Sneed, 2002).

By providing and using XML- based ODS, for instance, Web Services could be used for extracting and integrating data from existing ERP-systems. It offers significant advantages over currently available methods and tools. These advantages have been widely discussed in the popular Information Technology press. Because the Web Services paradigm is based on a new set of standards (e.g., XML, SOAP, WSDL, UDDI) (Hansen, 2001) it promises to enable the integration and aggregation of multiple data sources once these open standards are supported by the underlying ERP-systems. These standards are being widely adopted in industry as evidenced by for example Microsoft's .NET initiative and Sun's Java APIs for XML (JAX) extensions to the Java 2 Platform, Enterprise Edition (J2EE) (ibid).

#### **4 THE NEED FOR OPEN DATA STANDARDS IN SWEDISH MUNICIPALS**

In the KOMpiere project we needed to modify and integrate Compiere with the existing proprietary

systems. In order to do this we required access to at least a few of the existing non-open data standards used in the current proprietary systems. Early in the project we discovered problems with this. We discovered that the knowledge and awareness of the different data structures used in the existing ERP-systems was very poor in the municipals. This information was oftentimes not even possible to obtain and the different municipal's representative's referred to the specific software vendor that delivered the proprietary system in use. When trying to access these data structures from the software vendors. We discovered, not surprisingly, that they were reluctant to provide us (or anyone else) with this information. This is due to the simple fact that data is vital to any organization. The importance of data and data storage to any organization and their ability to perform their services can not be stressed enough. Where and how the data is stored defines the organizations possibility to use, adopt and integrate new systems and services. The ability to extract data maybe needed from multiple requesting sources, and the ability to move data from one database to another, either at the end of the life of the existing database or in the event of the sale of that data to another organization is of crucial importance. Of course this is a very valuable commodity to the proprietary software vendor and something they are reluctant to "give away" for free. The question is how this "knowledge commodity" ended up in their hands in the first place? The business practices of preserving and leveraging market advantages through non-open data standards hinders interoperability and true market-forces to apply. Government usage of open standards and open source could have a positive influence on the take-up of interoperability standards by the competing software vendors. As municipals handle not just confidential but also up to date information of key importance, data loss due to unreliable systems or unreliable software vendors as well as data loss due to lack of knowledge and appreciation of the value of the data-structures in themselves may cause serious problems. This knowledge is too valuable and important to be given away to the software vendors.

We advocate the use of ODS for all public government systems in Sweden. As a matter of fact Swedish municipals should be crying out for low-cost and flexible solutions to manage their ERP-systems. The need for this is something that already is identified in the European Community. In projects such as Interoperable Delivery of European eGovernment Services to public Administrations, Business and Citizens (IDABC) they stress the importance of interoperability through ODS (IDABC, 2006). IDABC is an European

Commission driven strategic project using advances in information and communications technology to encourage and support the delivery of integrated cross-border public sector services to citizens and organizations in Europe, to improve efficiency and collaboration between European public administrations and to contribute to making Europe an attractive place to live, work and invest. IDABC is a Community programme managed by the European Commission's Enterprise and Industry Directorate General. To achieve its objectives, IDABC issues recommendations, develop solutions and provide services that enable national and European administrations to communicate electronically and offer modern public services to organizations and citizens in Europe (IDABC, 2006). The COSPA-project mentioned earlier is another advocator for this. Within COSPA a study of Dutch municipals documented by Nagler (2005, p. 1) stated that (*"Open Standards are the presupposition for collaboration with other municipalities in the future. Common projects can be realised by the use of open standards."*). This is quotation we find very relevant and expresses something that we believe needs to be recognized and acted upon in Swedish municipals with urgency.

## 5 CONCLUSIONS

The KOMpiere project started out as a project aimed at providing the public sector in Sweden with an open source licensed ERP-system as an alternative to the predominant propriety systems used today. We believe we "stumbled" on a much bigger issue, where we discovered that at least some Swedish municipals don't have free access to the data they are appointed to use, govern and protect. The software vendors have, by using non-open data standards, excluded the municipals from using their own data freely. This is an alarming situation that needs to get attention and hopefully be remedied. We have in this paper suggested the creation and usage of XML-based ODS for all systems used in the public sector in Sweden. To be able to fully provide the soon mandatory eGovernment services, the need for this is of crucial importance.

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