

Needs for a Semi-Open Source Software Business Model for Local Governments

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Abstract: The search for efficient business models for open source software is a hot topic both for software vendors and for customers and users of software. In this paper we investigate possibilities for a network of municipalities in Sweden, Sambruk, to use an open source business model for their procurement of software solutions. More specifically, the procurement of public e-services has been followed in seven case studies, of which one was studied in-depth and is accounted for in detail in this paper. The results are that municipalities' investments in e-services are important both concerning function and long-term cost of ownership. Open source software, OSS, can be an alternative, but in the studied procurement cases it appeared not to be a realistic choice in practise. This paper investigates why, and the conclusions are presented as general results. The authors also suggest an alternative business model referred to as Sambruk Community Licence, ie a semi-open source software business model for local governments.

Keywords: e-services, business model, municipality legacy systems, buyer-supplier relationship

1. The Sambruk Association and Open Source Software (OSS)

The challenge for many local governments today is to provide citizens with adequate e-services that function efficiently with internal administration, ie existing legacy systems and other information systems (which in a typical large municipality can be around 500 systems [1]). Tiny resources in most municipalities, large amount of retirements among the staff to come, combined with citizens' increasing expectations on e-services, especially among younger generations, sets high requirements on the procurement of e-service solutions. Moreover, most local governments provide its citizens similar services, and therefore economies of scale should be possible to obtain if several municipalities collaborate. With theses driving forces, enforced by the government and formulated in several policy documents [2-5], about fifteen Swedish local governments formed an informal network in 2002. Today this initiative has evolved into a formal association, named "Sambruk" (translated from Swedish to English it means *co-use* or *cooperative use*). The amount of members has grown rapidly and encounters in early 2008 for about 80 local governments, representing half of the Swedish population, and in numbers a bit less then one third of Sweden's 290 municipalities.

Moreover, open source software, OSS, should be an interesting alternative for public e-services shared between several municipalities. Already in the policy statement of the Sambruk association (2004) it is said that OSS should be considered as an alternative to

proprietary software. The economics behind open source software (OSS) is an emerging academic research field, and the search for efficient business models for open source software is a hot topic both among software vendors and for customers and users of software [6]. The possibilities for customization of software are enhanced thanks to the openness, but at the same time professional support is a prerequisite for business critical applications [7]. For example, Fink [8] discusses the open source effect on the value of software, and Weber [9] go as far as to call it “*the code that changed the world*” in analogy with the Toyota lean production system that changed the automotive industry [10].

The role of Sambruk is to coordinate development and procurement of e-service application for Swedish municipalities (see [11]). The most important keyword for Sambruk members is *practical use*, and therefore well-functioning e-services with the existing IT environment are critical. Since e-service applications concern input to and output from local governments’ legacy systems (as e.g. economy or work-flow systems), Sambruk and its members had to consider standard interfaces between applications and legacy systems at an early stage. For this purpose Sambruk developed a standard, Open Technology Platform, OTP (see *ÖTP 2.0* [1], [11-12]), that specifies interface formats. With the OTP development, several collaborative procurement projects, and an increasing amount of member municipalities, Sambruk is now evolving towards a policy maker for local governments, and grows in national importance.

2. Objectives

The objective of this paper is to investigate the need for new business models for e-service for Swedish local governments. Especially, the challenges in the procurement process are examined, and the possibilities to freely choose software supplier, regardless of previous choices and path dependence, that is the most advantageous during the procurement phase as well as during long-term maintenance and further development. As an illustration, a procurement project within the Sambruk Association will be described.

3. Methodology

A Sambruk procurement case was studied in-depth in this research; “e-service for child care”. This was one of seven pilot projects within Sambruk during the initial years 2004-2007. The others were (1) application for local grants to sports and leisure-time associations, (2) case and document management system, (3) digital assistant, (4) renewed application for economic aid, (5) common e-service for special support (according to Swedish laws LSS/LASS), (6) application for upper secondary school course program [12].

The research approach taken was action research [13], ie with the combined intention of contributing both to a local practice studied, and to develop scientific knowledge. In the Sambruk projects the scientific results are also claimed to contribute to practitioners (outside the local practice) as a “general practice contribution”. This approach has been labelled practical inquiry [14]. The principles of practical inquiry are depicted in figure 1.

In this research project the researchers have participated in many of the Sambruk activities, such as the association’s board meetings, all grand meetings (with 100-120 participants), several project meetings, and have conducted interviews with project managers. Moreover, the researchers have participated in so called “informal network meetings” with a few of the Sambruk municipalities and the largest IT suppliers for the public sector. One of the authors is not part of the research team, but instead an administrative director of one of the 25 largest municipalities in Sweden, and also the project manager of the in-depth studied Sambruk project e-service for child care.

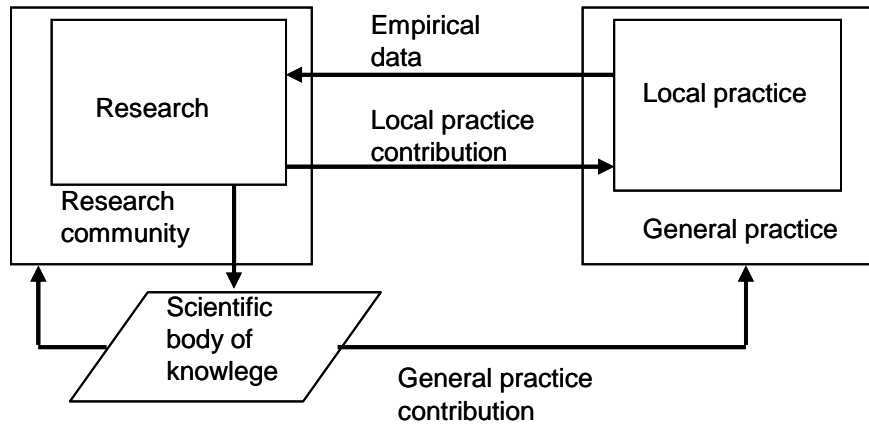


Figure 1: Practical inquiry: A research approach aiming at knowledge as a local and general practice contributions.

4. Case Description: E-service for Child Care

As a start of the research project in 2005 we observed the statement in the policy documents of Sambruk that open source software, OSS, should be considered as an alternative to proprietary software. However in practice, in all the procurements we have observed during 2005-2008, only proprietary software products have been considered. As researchers, we therefore became especially interested in following the different obstacles for using open source products in the development of e-services. To give an illustration we will describe briefly the Sambruk e-service for child care project.

4.1 Local Governments' Requirements and Expectations on the Child Care Function

In order to make child care administration more efficient and to meet the requirements on e-services, about 25 local governments gathered in Sambruk in December 2004 to start a joint procurement project. Initially, the expectations on a new web-based e-service were expressed as follows [12]. For **citizens** (in this case parents with need for child care) e-service would give better overview of the child care offering, policies, and rules for placements etc, homogenous subscription procedure regardless of chosen child care type, better availability (24/7), and communication between parents and the child care institution via the e-service. For the **local governments**, and the case handling personnel, the e-service was expected to lead to improved work flow and new work methods. This would imply gains in case handling, both in terms of time saving and improved data quality, from subscription application, when the child is placed in child care with schedule changes etc, to termination of cases, lower administration costs (less telephone calls and less photocopying and postal service costs), better decision support, eg for fee calculation, more efficient use of free child care places, faster replies, and equal service for all applicants.

Other requirements on the e-service were electronic signature for parents, management of prioritized geographical areas, etc. Based on these demands, the system specification work was finished in early 2005 after about six months where all the participating municipalities took part in the review process.

4.2 About IT Support for the Local Government's Child Care Function

At the municipality administration level, basic functions for schools and child care such as planning of operations and employees are managed in the legacy system. In Sweden there is an oligopolistic market situation with mainly two IT suppliers of legacy systems for schools

and child care. In the Sambruk project about half of the participating municipalities had one legacy system, and the other half had the other.

The idea of the e-service is illustrated in Figure 1. The “as-is” situation is shown to the left, where paper forms are used to communicate with parents (citizens), which the case handler puts into the legacy system. In the “to-be” situation to the right, parents communicate eg preferred choice of child care, dates, personal data (name, personal number, address, income etc) via a web based e-service. The “to-be” situation is a solution where e-service input is communicated directly to the legacy system.

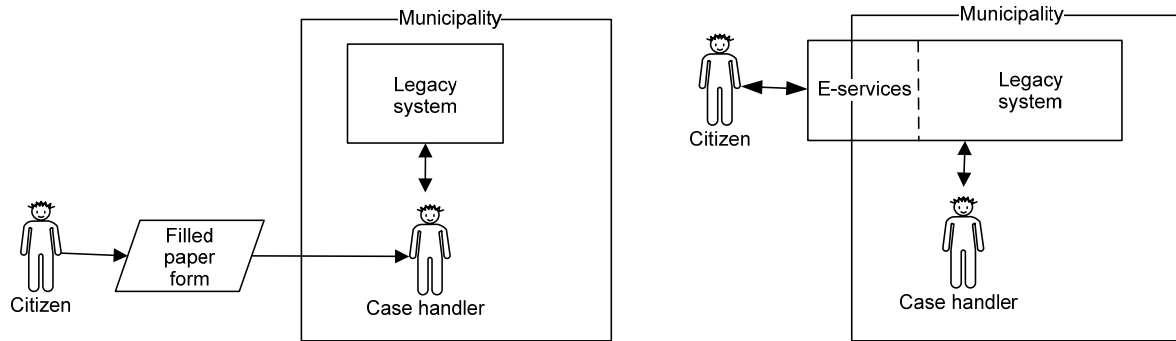


Figure 1. Left: as-is (paper administration for clients), and right: to-be (e-service for clients, integrated with legacy systems) situation for local governments' child care function.

However, an integrated e-service solution (the right part of figure 1) would require open interfaces to the legacy system. Today this is not the case, and therefore the e-service application can be separate and communicate through standardised data exchange interface (specified eg in the OTP), see figure 2.

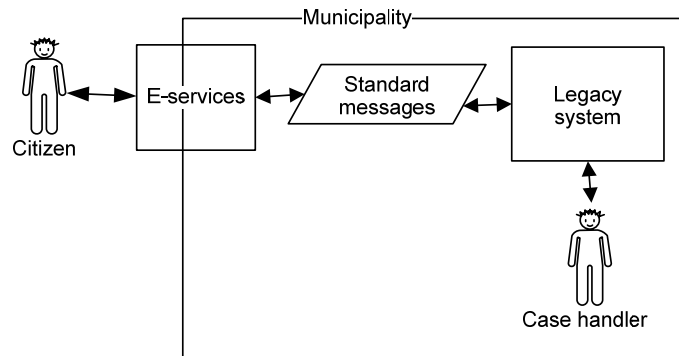


Figure 2. E-service as a separate application communicating with the legacy system via a standard interface.

The IT suppliers of legacy systems develop also e-services that are provided as complementary modules to the customer's existing system. For the municipalities this is not always advantageous; (1) the public procurement law is not respected if the call for proposals cannot be open to any supplier, (2) other possible suppliers' solutions are not evaluated, and (3) the development is a part of the suppliers' normal product development process, and thus become supplier-driven and supplier-controlled. A municipality might be satisfied with some parts of the legacy system, and not with other, but adaptations to its specific needs are usually expensive and complicated, if at all possible. There is therefore a wish to be able to choose different IT suppliers' solutions, which communicate with the legacy system via open standards. Especially the work in Sambruk, with the development of joint specifications for many municipalities needs, ie customer-driven, would be better off with standardized interfaces and a large choice of possible solutions.

4.3 The Procurement Phase for E-service Child Care

First, already in 2004, a possible gift was discussed, since one of the large municipalities in the group already had developed its own e-service for child care, and offered it to the Sambruk community. Questions were raised about the ownership of the code, responsibility for functionality and maintenance, if it fulfilled the requirements, if it was properly tested, how long-term integration with the two legacy systems could be controlled, development of standard interface, cost sharing, etc. These questions had no answers at this early stage of the process, and the discussion in the project group resulted in a common decision of not accepting the gift as a solution. Instead, it was considered that public procurement would lead to better result faster.

Before the search for practical solutions started, as a public procurement process, some prerequisites had to be dealt with in order to enhance competition. A “negotiated procurement” process where the procuring part invites certain suppliers to offer solutions and proceeds with negotiations with one or several of them [15] was estimated most suitable, and enhance innovation and creativity for new solutions since it allows a development dialogue with potential suppliers. A public procurement consultant was contracted, and the work started in 2006. Negotiations were undertaken with the suppliers of legacy systems concerning the standard formats. In August 2007 this phase was closed without a specific choice of suppliers. Instead, the legacy system suppliers expressed a wish to move in the direction of open formats according to Sambruk’s specification OTP, but also the potential cost this would lead to [16]. In late fall 2007 a “simplified procurement” process took part where any supplier can answer with proposals. The procuring unit, ie Sambruk, recommended the potential suppliers to turn to the legacy system suppliers to get the interface format specifications. In January 2008 three suppliers had given their bids and during spring 2008 new negotiations took part with these three, and two were selected that fulfilled the functional requirements, although not the requirements on openness. In a recent news paper article [17], the managing director for Sambruk states that *“promises about openness from the legacy system suppliers”* can lead to a positive change for Swedish municipalities’ possibilities to contract third party suppliers.

5. Developments and Results

5.1 The Challenge of Legacy System Path Dependence: Towards New Business Models

A critical issue is interoperability between legacy systems and e-service applications. It is openly expressed within Sambruk that new e-services should be separated from the legacy systems and possible to deliver from any supplier – regardless of open source or proprietary software supplier. The most important criteria is interoperability, ie that the e-service application can cooperate with any IT environment, since e-services rarely are stand-alone applications. OTP is a suggestions for such architectural model, built on established principles for information system structuring [14, 18], and Service Oriented Architecture, SOA, see eg [19].

In most of the studied municipalities there seems to be limited experience of practical implementation of open source software. Instead, the participants in the studied procurement project, and among the municipalities in Sambruk as a whole, express frustration concerning the lock-in effects in current IT environment. Because of the lock-in situation it is for practical reasons difficult to change e-service procurement, installation, use, further development, and maintenance of software (as pointed out in [9]). In discussions with IT suppliers in the informal network meetings these issues were discussed, and both buyers and suppliers agreed that small choices in adapting the legacy systems for a

specific local government, on its demand and paid for by the single customer, over the years had led to these tailor-made monolithic solutions, that held back standard formats. We refer to this situation as “legacy system path dependence” for local governments.

This background is important for understanding the obstacles that the Sambruk community faces when local government seek common development of e-services that can function with any IT environment, independent of chosen supplier.

A conclusion from the case study is that although Sambruk reached a stronger position as a buyer, it did not become easier to negotiate with the strong oligopolistic suppliers.

5.2 Semi-Open Source as a Solution?

In parallel with the ongoing procurement processes of e-services for child care and the six other procurement projects, there has been an on-going research and development work focused on developing business models and work methods for Sambruk e-service procurement and maintenance (including further development). It was based on conclusions from the studies of procurement projects, where it became obvious that there was a too great leap for the local governments to direct their development efforts towards open source. There were limited experiences from open source software and the local governments were hesitant, due to the existing IT environments, lock-in effects, and path dependence in the legacy systems. Moreover, in the studied public procurement processes no OSS alternatives were suggested from suppliers. In parallel with this research, in 2006, the Swedish Association of Local Authorities and Regions (SALAR) took initiative to the public initiative for OSS called Programverket [20]. It consists of an open repository for OSS for the public sector, and recently also a competence network, Open Sweden.

As a movement from proprietary software, where licence fees are paid to the supplier that cares for maintenance and further development, towards complete open source, where any OSS suppliers (or the buyer itself) can provide services that guarantee functionality, we suggest “semi-open source software” for the Sambruk community. The main difference between proprietary and open source software is access to source codes and formats, which in the first case belong to the supplier. OSS is instead shared according to a licence that users and developers have committed to follow, such as General Public License (GPL). The user has free access to code for use and change, but has to share these changes freely [21].

The idea of a business model in between these two extremes is that pure open source is not a realistic alternative for most municipalities today, but nonetheless openness and buyer control should be enhanced in order to make e-services for the Swedish municipalities more efficient. Sambruk Community License was suggested in [22], ie open source software for a limited group of users. Like the OTP for increased interoperability, this could be a complement to requirement specifications in public procurement processes, and a standard agreement in future contracts with IT supplier. It is based on an analysis [23] of several procurement alternatives for a municipality or groups of municipalities within Sambruk.

The main difference from today’s procurement process is that while the municipality today buys the right to use the supplier’s software, the municipality will pay a fee for using Sambruk’s version of the software. As a consequence of economies of scale, with several Sambruk members sharing the same software, such fee would be lower than today, and Sambruk would be in the lead of further development. A remaining question is the ownership of the software. The suppliers of proprietary software will probably not let Sambruk share the software freely within the community, and at the same time the question is whether Sambruk shall own any software code. This is a strategic choice for the association.

The suggested new business model would rely on strong buyer-supplier relationships for development and maintenance of code, but also for the skilled buyer to make its own

development and maintenance. The main difference compared to today's situation is that the buyer side would gain power over the requirement specifications and the roadmap for further development. The development process would thus be user-driven [24], and the deep knowledge of the needs from core activities in the municipalities better taken into account. Moreover, we believe that such control enhances interoperability, and standard formats, something that in the long run ensures more open architectures and more efficient public e-services.

6. Conclusions

Summary of achievements

From a business model perspective, the case study reveals new knowledge on the transition from supplier-controlled to customer-driven software development. The results of the case study (customer side) can be summarized in the following three factors:

1. There is a critical need for open standards, ie interfaces between software from different software vendors.
2. There is a need for fruitful dialogue between the customer and software suppliers of its current IT environment.
3. There is a need for cooperation and perseverance among the representatives in the buyer network.

The obstacles against a strict open source alternative brought the development of a community source alternative. We consider our proposal as a special variation of open source, adapted to the particular circumstances of a collaborative arrangement of local governments aiming for joint e-service applications. The term "semi-open" instead of open-source software refers to that the software would be shared among members of the Sambruk association, at least during an initial timeframe. Common characteristics with proprietary licence models are a clear development responsibility and a clear roadmap for development. The community software would be open and free within the association and their members (local governments). Every member can use it freely and change it according to open source principles. We also suggest close collaboration with Programverket, the Swedish repository for OSS for the public sector and a competence network that is being established.

Further work needed

The suggested semi-open source business model hopefully makes it possible for the local governments to move towards open source. In the development of this semi-open source business model (with cooperation principles, business models and types of agreements) there have been a lot of arguments for and against semi-open source. There have been arguments from open software advocates as well as proprietary software advocates. We have exposed these different arguments and formulated counter-arguments, in order to reconstruct and disclose the argumentation process leading to our formulated community source alternative. However, we have not yet seen the semi-open source software business model in use. Both research and practical work is needed to further elaborate the results presented in the paper, and to evaluate pros and cons of such business model.

More research is also needed on the supplier side. One remaining question is for example the obstacles for OSS suppliers to bid in public procurement call for proposals.

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