Innovative Business Models Enhancing Open Source Software in the Public Sector

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Abstract: The objective of this paper is to suggest new business models and supporting arrangements for open source software in the public sector, specifically for Municipalities. Methodologically, the study was carried out as a practical inquiry. Results from the initial diagnosis of longitudinal case studies 2005-2008 in a Swedish network of 80 collaborating Municipalities, and a survey 2008 to all Swedish national and local authorities, indicated that Swedish Municipalities do not use OSS to a large extent for several reasons, and that experience sharing and a supporting framework were requested. As a solution, a semi-open business model framework was suggested. This framework was developed and implemented in the form of action research. Evaluation of the implementation indicated two major conclusions presented in this paper. First, it was concluded that a semi-open source business model could strengthen the community, in so motto that the user-driven innovative solutions stay under control of the user organization. This prevents that the customer’s own development efforts in collaborative projects unintentionally are transferred to supplier companies, and need to be re-purchased in the form of packaged solutions, a phenomena that was observed in several previously studied cases. Second, it was concluded that the semi-open source business model can work only if both customer-side and supplier-side can take advantage. An open attitude to enhance fulfilment of the supplier’s drivers, such as commercialization opportunities, is needed from the customer side. Otherwise important knowledge contributions from suppliers may be limited.

Keywords: e-services, business model, municipalities, collaboration, buyer-supplier relationship

1. Introduction

Open Source Software (OSS) and open standards are often put forward as a cost efficient and innovation supportive solution for software in the public sector [1] [2]. Some even goes as far as to call it “the code that changed the world” [3]. Moreover, the economics behind OSS is an emerging academic research field, e.g. the value of open source on software [4]. In line with this, the search for feasible business models for open source software is a hot topic, both among software vendors, customers, and users of software [5]. The possibilities for customization and lead-user development of software are enhanced, thanks to the openness [6], but at the same time professional support is a prerequisite for business critical applications [7].

As opposed to OSS, traditional software, referred to as proprietary or closed software, are renowned for state of the art software solutions. However, no matter of the type of software, there are still costs for development, user training, modification, and support,
which commercial companies need to cover. There are three business models used for software: *direct-sale, indirect-sale and risk sharing* [2][5][8].

Proprietary software makes use of the direct-sale model, for which the user pays a license fee for the rights to use the software, in addition to upgrade and support agreements. OSS, on the other hand, already have a license, which provide the users with the right to use, distribute and change the software, which makes a direct-sale model useless. Therefore, there are alternative models, such as risk sharing, where customer and supplier share the risk for developing and maintaining a software, or in-direct model, where the company charges for service and support. In addition, in some cases there exist hybrid-models, which mix different models for the same software [5], [7].

Standardized and proprietary applications often necessitate customized design to fit the activities in municipalities and public authorities. There are two alternatives to the proprietary systems; new development within the authority or through a supplier; or an open environment, where knowledge and experiences are shared, together with specifications and work processes. This will reduce both development and support costs and also aiming at economizing scarce common resources, and improving user-driven innovation [9], [10].

Earlier studies in Swedish municipalities show that use of OSS is limited [11][12][13]. This is despite national guidelines proclaiming that OSS and open standards are to be considered whenever possible, instead of proprietary software [10][14][15]. For example, in late 2008 it was reported that less than a fourth of the Swedish authorities had started to develop a policy for considering OSS in IS/IT procurement processes [11][12]. The main difficulties reported were: a) interoperability problems with existing systems, b) lack of support and maintenance, and c) uncertain development roadmap. In addition, the authorities asked for support in acquisitions and use of OSS in the public sector, especially experience sharing, a national policy, and general guidelines [11][12].

Our previous studies reveal that municipalities’ system environments often are “walled-in gardens” due to proprietary software [13]. The existing software applications are monolithic and closed “black boxes”, designed with the municipality’s organisational structure in mind. This entails that there are no standard interoperability interfaces available, which makes e-services expensive to develop. Neither the supplier nor the customer is willing to pay for this development. While this is unfavourable for the customer, it might be beneficiary for the supplier, since it strengthens lock-in effects and possibilities for a profitable, long-lasting revenue stream. Thus, the supplier may become reluctant to disclose the architecture or interfaces of their applications packages [13].

This paper is a part of the project BOSSANOVA¹, which aims to study underlying business models for Open Source in the public sector, both from buyer and supplier perspectives. The project is a joint initiative by academic researchers and the Sambruk association, consisting of 80 Swedish municipalities, representing about one third of the Swedish population. The main objective of Sambruk is to strengthen municipalities in the e-service area, through joint specification and procurement of e-services and other e-government applications. The purpose is: “to create a foundation for an effective development programme, comprising both the technical and functional aspects of e-services, as well as the need for re-engineering if the municipalities’ internal business processes” [16, p 2].

The project BOSSANOVA has proposed a framework with standard agreements between stakeholders, based on OSS ideals, within Sambruk. The framework is called *Sambruk Community Material* (SCM²), and comprises not only software but also other

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¹ BOSSANOVA is the acronym for: Business Models for Open Source Software – New opportunities for buyers and suppliers in the public sector.
² In Swedish: Sambruksgemensamt material (SGM).
The development of intellectual capital, e.g. specifications, process models, conceptual data models, documentation, etc [17].

2. Objectives

The objective of this paper is to suggest new business models and supporting arrangements for open source software in the public sector mainly intended for municipalities. This includes the presentation of the rationale for these models and arrangements.

3. Methodology

This research has a clear practical intent. It is not the case of simply studying business models for OSS. As said above, we have contributed to the development of business models. This has been done in close collaboration between researchers and practitioners. The research can be described as a practical inquiry [18]. Such a research endeavour has several purposes and target groups. It contributes to direct practical results (in this case the SCM framework) aiming for different stakeholders developing and using OSS (Sambruk, municipalities, IT vendors). As a research endeavour it also contributes with generalized results; a general practice contribution [18]. The generalized results (i.e. abstracted knowledge) are aimed for both research community and practitioners in other practice settings than Sambruk and its members.

The direct collaboration between researchers and practitioners developing SCM can also be described as action research [19]. This comprises different activities as diagnosis (inquiring why municipalities are not using OSS more), action planning (design of SCM), action taking (implementing SCM), evaluation (investigating possible effects) and specifying learning (researcher and practitioner analysis and reporting, like writing this paper). Practical inquiry and action research can be seen as cyclical activities.

In earlier contributions [13] [20] it has been explained that the researchers continuously participate in many of the Sambruk activities, such as project meetings, the association’s board meetings, all grand meetings (with 100-200 participants), and conduct 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, and for the presented SCM framework also have arranged a meeting with open source software suppliers (fall 2009). The ongoing research within Sambruk thereby can highlight different aspects of buyer-supplier relations, and how a buyer community need to manage relationships among members.

In parallel with the action research in Sambruk, a web-based survey with Swedish public authorities and Swedish municipalities as respondents was conducted in order to perform diagnosis about the use of OSS and the need for guidelines and support for public procurement of OSS, as reported in the introduction of this paper. The survey was conducted in co-operation with the Swedish Association of Local Authorities and Regions (SKL), and the Swedish Administrative Development Agency (Verva). [11] [12]

4. Developments

The first initiative of the studied community was taken in 2002, when a handful of Swedish municipalities joined forces in a network for municipal collaboration for development of e-services. In 2005, the community was formally established as the non-profit association Sambruk, with the core values openness, accessibility and participation [16].

The Sambruk project model (Figure 1) defines the standard work procedure for development projects within the association.
As shown in the model, any member can participate in all projects, and use the result of a project. The cost associated with the project is shared between the project members. The project normally includes third party members, e.g. suppliers or researchers, of different kinds, depending on their role. The concept is to create a “win-win” situation between the different stakeholders; citizens, member municipalities, suppliers, and Sambruk. In order to provide their citizens with effective e-services, the members of Sambruk cooperates with each other in order to procure the services for a reasonable price. The suppliers get reasonable incomes for the services they provide. Finally, with successful projects, Sambruk is able to attract more members.

Research studies of Sambruk projects in 2005-2007 revealed however that the development and public procurement processes hindered Sambruk from living up to its core values [22]. One reported example was eService for childcare. The specifications, developed by about twenty project members, included reference to Sambruk Open Technical Platform (OTP) framework for interoperability. Thereby, the development of the application was supposed to be open to many suppliers, not only the existing suppliers of legacy systems for school administration. However, due to the lack of open interfaces at a technical system level, the software was finally procured by the two main suppliers [13]. Despite the effort of implementing the OTP in the specifications, the participating member municipalities were in practice locked-in with their current systems solutions. Path dependence of previous investments was too strong, and therefore it turned out that choosing solutions other then the current suppliers’ was not possible. In parallel, open alternatives such as those managed by a national open source repository existed3, but were not seen as a realistic alternative in the procurement process due to uncertainty concerning

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3 Programverket, OSS repository for Swedish authorities instigated by SALAR, was active 2007 to 2009.
both development and life-long guarantees. Neither could a donated e-service from one of the members in the project be taken care of.

From this, and a handful of similar cases, it was concluded that an agreement ensuring that the intellectual property rights (IPR) to the developed material stayed at the customer side was needed. The idea was to address the weaknesses of existing business models. The cases showed that open source was not applied due to limited knowledge, and perceived uncertainties about functionality and support among the members. The existing, traditional proprietary licence model showed clear lock-in effects. Therefore a “semi-open” business model was suggested, where the collaborating members keep the initiative of the developed material, decide about sharing of results as well as costs for development and support. The drawback of this semi-open business model is that the material is not immediately made open, only when decided so by the project.

However, since specific public sector applications rarely attract external developers interest, it can be better to present a more “ready-made” product [23]. In addition, a strong responsibility for cost sharing and future development roadmaps is probably more important. With this in mind, the suggested business model allows for, at a certain point of the development, to introduce the material under an OSS license. Agreements for maintenance and support could still be negotiated with suppliers.

In order to implement these conclusions, and following the core values of the Sambruk association, a set of standard agreements for SCM was developed by the researchers and the presidency of Sambruk. These agreements were presented to the Board of the Sambruk in several consecutive meetings during 2007-2008, were revised several times, and approved for implementation on pilot projects during 2009-2010. The SCM framework refers to OTP [20], proclaiming interoperability between the e-services to be developed and existing legacy systems, and open standards for the developed software.

The SCM framework currently (spring 2010) includes eight documents: SCM1, which is the introduction to the framework; SCM2, which are the rules and regulations; and then six agreements, SCM3 – SCM8, covering different aspects of participation in projects in

Figure 2: Acquisition and continuous usage phases for SCM [20].
Sambruk. Each of SCM3-8 specifies in an appendix the specific material for that agreement. The last two agreements, SCM7 and SCM8, were developed during the implementation phase, when it was discovered that there were no agreement applicable when a researcher or students is a participant. The researcher has an interest in academic publication, while the students develop at the same time for grades in a course and usually without interest for commercialization. However, if a commercial interest exists existing agreements are applicable.

5. Results including Possible Business Benefits

During the development of the SCM framework several on-going projects gave experiences and learning as input to the development. The first version (2006-2007) was labelled *Sambruk Community License*, but it was clear that the framework should not be labelled a “license”. The main reason was that the term licence means an authorization to use a material, and such a license would not be applicable together with OSS licenses.

The purpose was to protect the IPR for Sambruk members, through a) securing that a supplier could not close commonly developed software, and b) make it possible to distribute the developed material freely, if needed. These purposes lead to the suggestion of *Sambruk Community Software.* However, experiences from other projects gave at hand that other types of results of the common efforts might need protection, for example process descriptions, re-engineered work processes, documents, etc.

In order to encompass other type of materials, the framework was reworked as *Sambruk Community material*. The new framework was presented to all on-going (Phase 1) projects late 2009. The projects were of different character (see Figure 2 above) and in different states. Three projects were in the final stages of development, while two had already reached Phase 2.

The research shows that the SCM framework seems to enhance innovative, collaborative, customer and user-oriented design, while ensuring that the IPR stays with the association. In addition, through the control over the developed material, members of Sambruk perceives value from their membership while the framework also ensures openness to enable non-members to share both the results and costs.

Moreover, the issue of how non-members can share the results have been discussed by the Board, and the indicated direction is that non-members should be able to share the results on equal terms as members. No organization should be forced to join Sambruk, just to be able to share the result, since the long time goals for Sambruk is not having many members, but to share costs and experiences. This decision demonstrates that the core values “openness and accessibility” are stronger than member recruitment, although the discussion is not yet finished on this topic. The driver for member participation in the Sambruk association is to be active in the development and to share experiences along the development of material.

However, the buyer-supplier relationships remain untested in this ongoing implementation and evaluation work. The empirical experiences this far, albeit limited, indicates that involved suppliers are keen to influence the roadmap of jointly developed projects. The question is how effective the business opportunities are for the suppliers.

One possibility is to provide services to the members. However, these services must be offered through competition, in accordance to public procurement legislation, but the supplier would have the advantage of having established relationships with the customers and favourable experiences of the developed software (or material). There are advantages for the customers as well. The principle of non-exclusivity for suppliers makes it possible to contract local suppliers for better services.

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4 In Swedish: Sambruksgemensam programvara.
A second option, one that has been proposed by some suppliers, is to commercialize the jointly developed material (e.g. software) on the open market. In SCM, this is a valid option, and the Administrative Council for the software, together with the Board of Sambruk, may decide to agree to share the rights with the supplier and agree to make a commercial fork of the software. There are currently (spring 2010) two cases to be evaluated in terms of shared IPR. There may be several disadvantages from forking [8], for example, divided development, new versions without a well-specified roadmap, development outside the scope of agreements, etc. However, there may also be important advantages such as further innovation from customers outside Sambruk, which later on could be incorporated in the first solution. From the Sambruk member side, the only issue would be that the commercial version would be much more developed and not available to them. However, an open attitude towards suppliers may prevent lock-in in both directions.

Another situation arises if the supplier is a researcher. In accordance to Swedish legislation, researchers should have the rights to use material that he or she has developed for academic purposes. SCM is equipped to handle this situation as well.

We have been made aware of another supplier-driven initiative, where the supplier suggests an agreement where the participating group of municipalities (outside of Sambruk) is given the right to use and further develop the software for their own use, while the right to distribute the software is withdrawn. This may be seen as a reaction to an ever-stronger customer side, which is also part of Sambruk’s vision [16]. The discrepancies between customer-side and supplier-side initiative has reached another round.

6. Conclusions

The SCM framework is a set of rules and regulations, and guidelines for development of user-driven e-services. The framework regulates the ownership of the IPR for development projects within Sambruk, while the stakeholders in the project regulate the implementations, development, and maintenance.

The framework is the result of several years of research, concerning the limited use of OSS in the Swedish public sector, specifically among municipalities. The concept suggests a semi-open business model in order to facilitate a wider acceptance of OSS among municipalities. When evaluating the implementation of the framework, two major conclusions are indicated:

Firstly, the suggested semi-open source business model can strengthen the community where it is applicable. The most important principle is that the IPR of the user-developed solutions stays under control of the customer organization, and not unintentionally transferred to the supplier company, with the result that customers have to pay for something they have contributed to develop.

Secondly, the semi-open source business model may only if both customer-side and supplier-side are benefited. An open attitude to enhance supplier commercialization opportunities is needed from the customer side. On the other hand, the suppliers must also address the concerns of the customers, regarding lock-in and licensing issues. The concept will not work without open-minded supplier and customer interaction.

This is an on-going study that will be further analyzed, documented and compared with similar initiatives. The BOSSANOVA projects will continue to test real business projects during 2010, after which the analysis will be summarized as a list of recommendations, concerning buyer-supplier relationships in OSS in general, but addressing the public sector specifically.

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