

# Joint Municipality Venture to Create a New e-Services Platform

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**Abstract:** This paper describes a unique collaboration endeavour within the municipal sector in Sweden; ‘Sambruk’, = ‘Association of Municipalities for Joint Development of e-services’. The main objective is to strengthen municipalities in the e-service area, through joint specification and procurement of e-services applications. Actively assisted by a research team from Linköping University, a large number of local municipalities collaborate in requirements analysis processes, to establish ‘best practice’ solutions. The purpose is not only to create a new contact channel (e-services), but to improve internal and external efficiency. The specification document ‘Open Technical Platform (OTP)’ defines a modularised architecture, with open interfaces for structured and standardised data exchange between different software applications. The OTP specification will dramatically reduce the market barriers for new suppliers of software solutions, which will foster innovation and competition and provide municipalities with better opportunities to find cost effective software solutions to enhance the service offerings towards its customers.

**Keywords:** E-services, Collaborative Working Environment, e-Government, open software architecture, user-driven innovation

## 1. Introduction

The past ten years have seen a rapid growth in the development and launching of new public e-services over the web, aimed at citizens, enterprises and organisations. The overall vision is to allow all external stakeholders web access to Government agencies and also be served by them anytime, anywhere. The main concept used is ‘Public e-Services’, technically devised as a public service offering mediated electronically through a user interface, usually (but not always) through a web site. The concept is used for a great variety of services.

A municipality embarking on a task to enhance quality, speed and efficiency in its existing service offerings, by implementing e-services solutions and re-engineered business processes, will face several challenges in terms of strained resources (staff and finances), as well as limitations in available innovative software solutions, due to the lack of natural market dynamics, with a multitude of large and niche suppliers of software solutions, found in the market for private enterprises.

The options available when evaluating and selecting e-services software solutions is often limited to domestic suppliers, offering so called standard software packages for a

variety of e-services. The software solutions have hitherto been designed to integrate only with the basic software packages for back-office applications, provided by the same supplier as for the e-services systems.

Since local municipalities do not compete with each other – at least not in the sense private enterprises do – a collaborative working environment can be established. But, to be effective and productive the process has to be supported by a structured methodology and rather “firm” management of the process, ensuring that each participating organisation’s specific conditions, demands and constraints are reviewed and benchmarked against its peers.

To form an effective and structured Collaborative Working Environment, CWE, ‘The Association of Municipalities for Joint Development of e-Services’ (in Swedish; ‘Sambruk’) was established in 2004. Today the association comprises almost 80 municipalities as members.

This paper will describe the basic platform established for collaboration and working methodologies, as well as the positive results of two projects, in terms of

- defined enhancements in operational efficiencies and service quality within participating Municipalities
- the successful change of existing business strategies utilised by the dominant software suppliers in Sweden when offering software solutions, related to e-services applications

## **2. Objectives**

### *2.1 Creating a CWE to enhance Business Process Analysis and re-engineering*

One of the main purposes of ‘Sambruk’ is to provide an arena for a large number of autonomous Swedish municipalities to join forces and set up a Collaborative Working Environment (CWE) focusing on e-Government development. Haug [6] calls this phenomenon “digital collaborative arrangement”. This comprises the creation and sponsoring of a repository of knowledge in business process analysis and development, in order to identify new and more efficient operational procedures for the administrative processes within a municipality’s organisation.

By analysing and benchmarking several different municipality business processes, openly identifying problems and bottlenecks and creating a best practise description for each process, the project members can jointly create and share a greater knowledge base, to be drawn upon in their respective local organisations.

To enhance knowledge development in the working groups, the CWE was supplemented by a University Research Team, lead by Professor Göran Goldkuhl of Linköping University. The approach and methodologies used are described in section 3.

### *2.2 Creating a General Open Technical Platform*

A second objective is to carry out joint procurement projects, thereby creating a larger buyer base and thus having a better negotiating position towards both existing vendors and new market players offering e-services solutions. The Swedish market of software solutions for public organisations’ demands and needs, both in back office applications and in the e-services area, is rather limited. This means that a few dominant suppliers have created an oligopoly situation. This creates high barriers for new suppliers to enter and therefore public organisations, like municipalities have limited opportunities to adopt new and innovative solutions.

By creating a general specification of a new software architecture, based on the general SOA (Service Oriented Architecture) principles [2] now gaining a wide acceptance in the ICT industry globally, Sambruk’s objective is to drive the development of the

existing dominant software applications towards a modularised architecture with open interfaces. The specification document, named **OTP – Open Technical Platform** [7] – comprise both definitions of a desired software architecture and specifications of information interchange formats, “Standard Messages” for the exchange of data between the customer front-end (e-services) applications and the back-office applications used by the administrative staff within a municipality’s organisation. OTP is further described in section 4.

### 3. Methodology

#### 3.1 Collaboration in the Business Process Analysis phase

For the first time in the history of Swedish public services, knowledge and experiences from a large number of municipalities are combined and fused into a joint requirements specification, using a structured approach, based on collaboration between municipality representatives, in conjunction with an active participation of researchers. After the requirements specification is finished and agreed upon, a procurement process is started, where different software suppliers can provide tenders. Following evaluation and negotiations, one or several supplier(s) are selected for delivery of a software solution to the different municipalities in the procurement consortium.

There are many obstacles for such a joint specification and procurement process. Even if there is a broad participation of different expertises in the requirements analysis project group, there is a risk of “group think”, particularly the obvious risk of the municipality officers adopting an inside-out view on public e-services. The remedy for this is adding an external view that challenges the perceptions of the officers participating in the project group. In Sambruk this external view was supplied by the research team from Linköping University.

The research approach taken is usually some kind of action research [8]. In action research there are combined objectives, i.e. to actively contribute to a local practice studied and to develop scientific knowledge. In the Sambruk projects these goals have been taken one step further. The scientific results are claimed to contribute not only to a restricted scientific body of knowledge, but also to practitioners (outside the local practice) as a “general practice contribution”. This approach has been labelled practical inquiry [3, 4]. The principles of practical inquiry are depicted in figure 1.

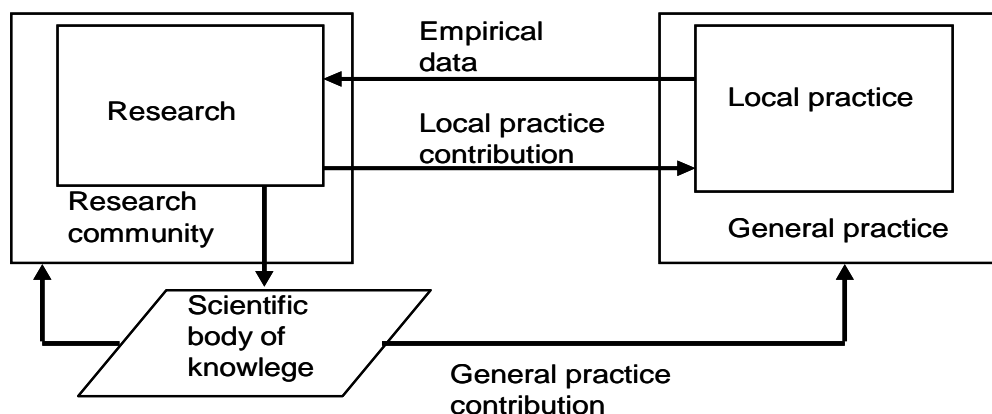


Figure 1: Practical inquiry: A research approach aiming at knowledge as a local and general practice contributions [4].

### 3.2 Defining a new IT Infrastructure Architecture for greater flexibility

Over the years, as IS/IT applications were more extensively introduced in public services, municipalities did not historically put very much “thought” to the issue of systems architecture. Systems design was left to the suppliers, who rarely looked outside their own respective portfolio of applications for the public sectors. The result is a closed, monolithic environment, with separate, vertical “silos” of applications, not being able to efficiently exchange data between them, nor being able to interface to other suppliers’ systems in the “vertical” sense (e.g. between front-end e-services modules and back-office administrative information systems). This situation created a lock-in between a specific supplier and its customer (municipality).

In order to address this situation and create a road map for a future IT Architecture, Sambruk embarked on a joint project to define an Open Technical Platform - the OTP specification. This included technical specifications of the desired application architecture, comprising well defined principles of information exchange between front-end (e-Services modules to be utilised by citizens) applications and back office systems. The objective of this project is to convince suppliers of back-office legacy systems of the necessity to “open” their systems to data exchange of standard messages, according to the specifications and the OTP principles.

## 4. Technology Description – OTP

The first version of the OTP comprised mainly specifications of a desired software architecture, with open interfaces and definitions of information exchange structures (named “Standard Messages”) between a front-end application and a back-office system. Several local municipalities have utilised the OTP specification as a technical appendix in their CFT (Call For Tender) documentation in procurement projects. The OTP specification was also utilised in two procurement projects carried out as joint projects within the Sambruk arena.

Based on the experiences gained, the OTP was revised and updated to its present version, 2.0 [7]. The revised version is now a 100-page document, comprising an extensive array of technical specifications and complete requirements texts, to be selected from as templates for CFT documentation in procurement projects. Selection of relevant specifications is carried out based on the actual business demands and existing ICT Strategy in the organisation (a Sambruk collaboration of several municipalities or a single municipality). Together with the functional requirements for a new software solution an overall, complete Tender Documentation package can be put together with substantially less work than previously has been the case (figure 2).

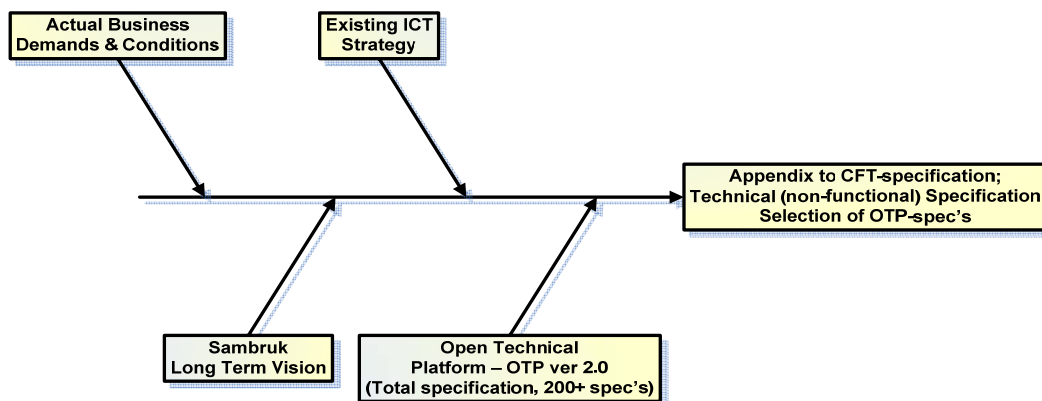


Figure 2: Relationship between business demands and OTP in a procurement process

The OTP specification version 2.0 is now generally available and free to download and utilise [7]. The document is as of today only available in Swedish, though, but could be translated into other languages, as need be. The basic principles and guidelines are generic for public services everywhere.

#### Benefits

- Re-usability = a more rapid completion of Tender Documentation, using existing, quality assured specifications. This will enhance the quality of the RFT documentation, which in turn will result in a higher quality of the suppliers' tenders, thus creating better price/performance in public e-services.
- Co-ordinated, consistent technical specifications used in all major public procurement projects will drive the market players to develop existing software solutions towards an open architecture, which is the norm in ERP suites for the industry today.
- An open infrastructure and software architecture will benefit municipalities, as this will increase competition in the market, both between existing suppliers and from new entrants into this arena.
- Furthermore, when fully implemented an open architecture will decrease total cost of software maintenance and development activities, ensuring that municipalities can focus on enhancing their service offerings as a whole, not only by adding new front-end applications to an existing, non-changeable infrastructure.

## 5. Developments

As EU Public Procurement regulations have changed and made it mandatory to issue complete CFT:s including specifications of technical requirements for each new procurement project (even under existing framework agreements), the need for practical, readily useable technical specifications is accentuated. The OTP Development Plan has identified this need for the Swedish market, but it would be quite feasible to extend this development towards an EU generic, translated version, to be utilised by other municipalities throughout Europe. This would further strengthen the public sector's demands on the suppliers of software solutions, to revise their respective software architecture according to the SOA principles [2].

Without the barrier of closed software packages, it will be easier for new entrants to create new, innovative software solutions to interact with existing in-house systems and with an European generic software architecture for the public sector, we expect a cross border deployment of software solutions in a market which hitherto has been characterised by national suppliers selling systems only within each country.

The methodological approach described in section 3 can also be developed into a European generic methodology where municipalities can collaborate, even cross borders, to enhance internal working procedures and establishing citizen centric e-services.

## 6. Results

### *6.1 Collaboration and research support, enhancing Business Process Analysis*

One of the projects utilizing the action research approach concerned e-services for child care. The initial requirements specification from this project was reviewed by the research team [3]. The researchers took explicitly a citizens perspective when reviewing the specification. When evaluating the specifications, several practical theories as assessment frameworks were used [e.g. 3, 5]. In the review it became apparent that the project group had conceived the citizens (i.e. the parents applying for child care) mainly as information

suppliers. This view needed to be supplemented by a more citizen-centric view; the citizen as a *customer* to be served. This supplementary citizen view led to a constructive criticism of the specifications and to several proposals for improvements. The project group revised the requirements specifications, following the review input, prior to initiating the procurement process.

The positive results of the development approach described in section 3 comprised both an enhancement of the internal working procedures in the municipality's administrative handling of incoming child care issues, as well as a better service offering for the citizen. The approach taken was thus not a restricted e-services focus. It was rather a process oriented approach, taking into account both e-services and back-office processes; confer e.g. [1] for process orientation in e-Government development.

The participation of several municipalities in such requirements analysis processes facilitates the search for 'best practice' solutions. The joint requirements analysis is a driving force towards harmonisation of diverse working practices. It will also contribute to finding solutions with better coverage, in comparison to what one single municipality would accomplish, carrying out the requirements analysis by itself. While the initial specifications regarded the citizen mainly as an information provider to the municipality officers, the revised design focused on the citizen as a *customer*, to be served by efficient e-services tools providing sufficient information to enable a quality decision as well as an efficient data entry service [3].

This collaborative working process, involving several municipalities, moves the initiative for standard software package development from the suppliers to the customers (i.e. the municipalities). The functionality of standard e-services applications are specified by the customers in detail. When several municipality officers collaborate in the specification of the desired functionality, the result is a true customer-driven innovation process [9]. This way of collaboration also opens up possibilities for choosing open source software solutions, which may give the municipalities even better functionality in new e-services applications as well as control of future changes and enhancements.

## *6.2 Utilising the OTP specification*

The use of the OTP specification, in combination with carrying out a joint procurement project comprising 20 municipalities, have now resulted in a paradigm shift, whereas the two dominant Swedish suppliers of e-services applications (previously only offered as extensions to their own basic software package for the internal administration) finally agreed to open up the interfaces for information exchange between the front-end e-services application and the back-office software. The new open architecture will now enable the municipalities to select the best e-services solution, independently of existing back-office software.

The process of "convincing" the major suppliers have been excruciatingly slow, almost two years, as the software vendors are extremely reluctant to surrender their existing business models, wherein long term customer relationships was based more on the earlier described closed software architecture, rather than providing excellence in services and applications. With the collective force of a large number of municipalities and some pressure from media [11] & [12], at least one of the major suppliers have now announced the redesign of their software architecture in accordance to Sambruk's OTP specification.

The long term result (within a two/three year period) with a widely accepted OTP specification, will be a huge reduction of earlier market barriers for new suppliers of software solutions, which will foster innovation and competition, thus providing the procurement side with better opportunities to find cost effective software solutions to enhance the service offerings towards its customer.

## 7. Business Benefits

The positive results in the projects described above, have realised several business benefits, mainly;

- The handling process of child care issues will be speeded up, while enhancing the quality of the decision making, due to the fact that relevant and correct information will be registered by the “end users” (i e citizens) themselves. Less administrative work, with a higher quality as the end result, will free up time and reduce bottlenecks in the municipality organisation, which in turn can be utilised in focusing on enhanced services in other areas, e g citizens in need of special care and attention.
- The paradigm shift towards an open software architecture, is creating a more competitive and innovation prone market arena, which in turn will benefit the municipalities in terms of more cost-effective software solutions
- An open software architecture will also benefit the municipality’s core operations, in terms of better possibilities of lateral information exchange between different departments, thereby enhancing planning capability and monitoring/quality control of the various business operations
- The overall benefits for the society must also be considered, as the citizens will have to spend less time searching for information and reducing errors that previously have created extra work both at the citizen side and within the municipality’s administration

The immediate positive results, as described above, will primarily and directly benefit the municipalities directly involved in the projects. However, with the Sambruk collaborative framework, it is a given task to ensure that these results – both in “technical terms” (i e new e-services modules developed as a direct result of the Sambruk projects) and the revised and enhanced business processes established with the assistance of the research team – will be shared with all other municipalities in Sweden. Information and sharing activities are carried out through various channels, e g through the Sambruk network, in open, public conferences and seminars, like eChallenges2008 and the DokumentInfo Conference [13]. Sambruk representatives also participate in other seminars arranged by KommITs [14] and SKL – the Swedish Association of Local Authorities and Regions [15].

## 8. Conclusions

Sambruk was instigated to introduce a Collaborative Working Environment, in order to create synergies instead of sub-optimising in the development of a new e-services platform and re-engineered business processes. The initiative is the first of this kind and scope, in terms of the number of participating municipalities and the projects undertaken, including the daunting objective to change the market players’ attitudes and business models regarding their own systems, as well as their customers. The Association is currently well on its way, with about 80 members (municipalities), to realise the positive and concrete results as described in this paper.

The important lessons learnt from the CWE of Sambruk so far;

- implementing e-services as a simple “bolt-on” to existing systems and processes will not create sufficient benefits, neither for the citizens, nor the municipality’s staff, without the active quest for analysing and restructuring existing business processes within the municipalities administration
- the collaborative working principles are somewhat cumbersome to manage as well as more time consuming than working in solitude (i e as a single municipality), but the benefits, in terms of enhanced quality in revamping internal business processes

and being part of a greater buying force towards the suppliers, have outweighed these issues

- introducing new specifications for the infrastructure and software architecture implies the need for changing the vendors business models and this is indeed a difficult and time consuming task
- the methodology of collaboration through all phases of business process analysis, benchmarking with peers and re-evaluation by external university researchers has proven very satisfactory in creating substantial enhancements in the new e-services introduced, as well as a better working environment for the municipality officers related to the services
- Sambruk has also demonstrated that it is feasible to move the market of software solutions suppliers toward an open, service oriented software architecture. The end result of this is an optimal ICT platform for future efficient development of existing and new ICT solutions supporting all levels of a municipality's business operations, thereby enhancing e-Government services to all stakeholders.

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