A guide including practical examples

Open-source software in the public sector

How public sector authorities can benefit from the advantages offered by open-source technologies
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Are you considering using open-source solutions in your local authority? Or do you have experience with Linux servers, but are sceptical about whether you should use open-source technologies beyond just your infrastructure? In this document we summarise the advantages of using open-source technologies – while taking into consideration the special requirements of public sector administration – and include practical examples along the way.

In both the public and private sectors there are similar, very good reasons for using open-source solutions. The open-source approach includes a number of advantages: an open architecture, a high degree of flexibility and comparatively low licensing costs. Companies and other commercial entities have long since come to this realisation, but the public sector has been slow to get on board. Although since the turn of the Millennium many locales have made tentative approaches (including this or that flagship project at the local authority level), it is really only in the past few years that public sector administration has really embraced the notion of open-source solutions. And well it should.
Current distribution of open-source solutions in public sector administration:

...international comparison

A number of countries in Europe have adopted provisions that ensure that open-source software must be the preferred option in tendering processes. These include countries such as Bulgaria, France, the United Kingdom, Italy, Sweden and Spain. Germany, however, has yet to join this list even though in its „Digital Agenda 2014-2017“ the German Government committed itself to further reduce „practical barriers for open-source software (OSS) with the aim of creating equal opportunities“ in procurement for the government. The current European Commission „Open-Source Strategy 2014-2017“, for example, is more specific - even if it does only apply to software that the Commission itself is using.

...in municipalities

During the initial years of the Millennium the first flagship projects for open-source solutions were already appearing at the local level. In Schwäbisch Hall, for example, the local authority had already dispensed with using MS Office products. This was followed in 2003 by Munich moving much of their IT resources to Linux. A survey conducted by the University of Maastricht in 2005 revealed that 49 per cent of all public sector administrations in Europe were using open-source software. Often the main decision makers, however, were unaware this was the case, because of the comparatively low relevance of the OSS solutions that were in use.
PRACTICAL EXAMPLE

The German Federal Police use open-source solution for realising

For years, the German Federal Police have been using the open-source platform Pentaho to support their key statistics and force planning activities. Pentaho serves as the basis for their data warehouse solution, which the police service uses to carry out evaluations as part of its reporting obligations to the Federal Ministry of the Interior. The German Federal Police do not use Pentaho out of any cost saving considerations, but rather because the platform offers exactly the data integration and data warehouse functions they need.

Using Pentaho, the police service prepares its key statistics, which they use for planning resources for major airports and their associated shift schedules. To do this, data obtained from various systems is merged in Pentaho and presented in a consistent, uniform manner. And thanks to Pentaho’s open interface, all data source systems can be connected with reasonable effort and expense. Using reports based on this data set, the police service can very quickly produce a comprehensive situational overview. Also, different user groups can access the evaluations using web front ends. The biggest advantages of using Pentaho for the police service are much shorter working processes, faster response times and uniformly formatted data.
Michael Becker and Henry Liebrenz from the center for information and communication technology of the German Federal Police work with open technologies.
Various open-source usage scenarios

Over the past ten years the use of open-source solutions in public sector administration has increased significantly. The Linux operating system and Linux servers now serve as the basis for a wide variety of applications. There are, however, a number of other deployment scenarios that are ideal for open-source software:

- Operating systems (e.g. Linux)
- Application servers (e.g. Tomcat)
- Databases (e.g. MySQL, PostgreSQL)
- IT documentation (e.g. i-doit)
- Monitoring (e.g. Nagios, openITCOCKPIT)
- Ticket systems (e.g. OTRS)
- Office suites (e.g. LibreOffice)
- Business intelligence (e.g. Pentaho, Jedox)
- Enterprise Content Management (e.g. Alfresco, Nuxeo)

Advantages of using open-source solutions

Traditionally, lower costs are the first argument presented in favour of using open-source solutions. But for municipalities or local authorities there are other benefits that may be of greater importance. Sometimes the greatest reason for using open-source technologies is not their economic efficiency, but rather the wider spectrum of benefits that they afford.

- Openness and flexibility
  
  Often the inherent openness and flexibility of open-source solutions is more relevant than cost. This is especially true where, for example, integration with other systems is necessary. Some requirements can only be realised using an open-source solution that can be precisely tailored to the given set of needs and is not overloaded with unnecessary functionality. Many proprietary applications offer a wide range of functions that are almost never used, but for which the customer has to pay a hefty sum of money. With open-source technologies, the consumer can choose exactly what he needs. And if any further options are required at a later date, these can usually be easily installed for free or acquired as part of an upgrade package (often referred to as an Enterprise Edition of the software).
Reliability and transparency

Offene Open-source technologies are often more reliable to operate than commercial solutions. For example, specialised Linux servers (proxy, DNS, etc.), which can be quickly set up and brought online, will literally run for years without needing to be touched.

And because the source code is open, any errors can be quickly identified by users and corrected by the developer community. Plus, the free and open communications that are characteristic of open-source forums and developer portals often ensure that those using open-source technologies feel more secure than users of commercial solutions. This builds enormous goodwill and user satisfaction, because most everyone at some point has had that helpless feeling of being at the mercy of a software manufacturer when it comes to troubleshooting issues.

Native open interfaces

Traditionally, open-source solutions have been used in IT infrastructure, because open-source technologies are especially good at exchanging data. Many councils and local authorities are having to address data integration and data interface issues. In most cases, open-source solutions can deal with such issues natively and easily.

The German Federal Police Service is a good example of this. The Federal Police Service uses the open-source data analysis platform Pentaho for bringing together data from a variety of sources and then, using standard interfaces, exchanges this information with other authorities. The political situation around the refugee crisis has only served to increase the urgency for the Police Service to find a suitable solution. Using the old, existing system, it was not possible to provide all the required data. This is where open-source solutions can exploit one of their great strengths: Open interfaces are a standard element of open-source technologies further information on the project is available on page 5.

Cost effectiveness

When it comes to thinking about open-source solutions and profitability, it is worth remembering that open-source software with the required depth and breadth of features for handling public sector administration work is not free. There are some associated licensing fees. However, in contrast to commercial licensing models, open-source alternatives have definite advantages. For instance, open-source licensing models are more customer-friendly, because they are less geared towards the current user or CPU pricing model. Also, users are free to decide whether they want to install (fee-based) updates. It can be said, therefore, that on the whole open-source projects are much more cost efficient over the entire project life cycle than closed-source projects.
PRACTICAL EXAMPLE

Stadtwerke Gießen AG (Giessen Dept. of Public Works): End-to-end IT service management processes by using open-source technologies

The Giessen Dept. of Public Works (Stadtwerke Gießen AG), the electricity, water and transport service provider for this city in Hessen, uses open-source solutions for all its IT service management. What began in 2012 as a straightforward SAP and server monitoring system has now become a complete IT service management landscape. This project is special because the open-source systems are integrated with each other, automatically exchanging data and synchronising each other at the same time. This markedly reduces the IT team’s daily workload.

This integrated IT service management system consists of a three-part solution composed of openITCOCKPIT, i-doit and OTRS. This configuration enables comprehensive coverage of all network monitoring, the help desk and ticketing systems as well as IT documentation. By implementing these thorough processes, Giessen’s Dept. of Public Works has greatly simplified its workflows. Should, for example, a hard disk be about to fill up, the openITCOCKPIT monitoring system will issue an alarm and generate a trouble ticket in OTRS that will contain a link to the configuration management database (CMDB) in i-doit. This contains both information about the relevant system and instructions as to what measures should be taken, if any.

Because the three systems are constantly exchanging data between themselves and, in turn, are being updated in real time, the Department of Public Works has a comprehensive database at its disposal that also greatly reduces their maintenance overhead. In just two steps, items in i-doit can be added to openITCOCKPIT and automatically included in the monitoring schedule. The only system that then needs to be maintained is the CMDB. Today, the Giessen Dept. of Public Works has a continuous, up-to-date view of all its IT components and their current status – thanks to the integration of three open-source solutions.
Rene Paul chooses open-source technology for the Giessen Dept. of Public Works
Big Data as a driver for open-source software

Big Data is becoming increasingly more important as the general trend toward digitisation increases and public sector administration is not immune to this trend. Also, the importance of Big Data is not just limited to areas such as Smart City projects. Public sector administration is coming to realise that IT and Business Intelligence can be used to make public assets such as energy, infrastructure and resources more economically viable.

If, in conjunction with Big Data projects, these resources are better researched and relevant data is collated, local authorities can act both more intelligently and with a greater emphasis on the well being of their citizens. This could include, for example, providing improved public transport, lessening the need for cars in cities and improving the flow of private vehicles.

Open-source solutions are also gaining ground in the public sector because they are widely used in Big Data and Business Intelligence. For instance, many projects by the Apache Software Foundation (e.g. Hadoop) are regarded as standard solutions for processing Big Data.
Practical examples of Big Data in public sector administration

The City of Frankfurt

As part of the „Open Data Frankfurt“ project, the City of Frankfurt is providing traffic data that is updated in real time. Thanks to this publicly provided information, motorists can avoid tailbacks by finding new routes around road closures or by taking public transport. This data can also be applied to commercial uses such as in conjunction with parking apps where motorists, for a fee, can reserve their favourite parking places.

Rhein-Sieg Abfallwirtschaftsgesellschaft (Rhein-Sieg Waste Management Company)

The correct linking and evaluation of data also plays a role at the Rhein-Sieg Abfallwirtschaftsgesellschaft (Waste Management Company) (RSAG). This local authority in the second largest district in North Rhine-Westphalia uses open-source software as the basis for its data warehouse solution. The aim is to better monitor and control operational activities and to optimise the planning of material flows.
Requirements for service providers

What should authorities be looking for in an open-source service provider, bearing in mind that the authority will ideally also want to arrange support and maintenance agreements with the provider? In addition to the required technical expertise in open-source work, the appropriate partner also needs to possess comprehensive integration experience and a trained eye for the overarching administrative processes that may also need to be implemented. In general, it is beneficial to work with a service provider who is well versed in the particular needs of public sector administration. This includes a basic understanding of administrative work and process handling as well as a rough overview of the relevant regulations. Otherwise, many of the service provider’s ideas and suggestions will simply be dashed on the rocks of current statutory regulations.

Open source: an enabler of technology

Clearly, open-source technologies can offer practical solutions for public sector administration. Open-source software is available, is mature, and is being successfully used in countless companies as well as in more and more public sector institutions.

And often the adaptability and reliability afforded by open-source solutions are more compelling reasons for their use than just the licensing cost argument. That being said, it must also be acknowledged that the costs for the open-source provider are often far lower than would otherwise be spent managing commercial software packages. At the same time, open-source solutions are paving the way to the digital future, because open-source approaches promote innovation. One need only think of the positive effects provided by open ecosystems. Google, for example, has demonstrated this with its own operating system, which, in turn, is based on Linux.

Flexibility, robustness, ease of integration and an efficient cost structure all speak in favour of open-source software. Whether viewed from a public sector administration or commercial perspective, the same thing applies: open source is a powerful and customisable enabler of technology that puts organisations in a position to achieve their goals within the framework of the digital transformation.
Procurement process difficulties

An important obstacle that open-source solutions have to overcome to become a part of public sector administration is the public sector procurement process. For instance, public sector legal requirements are often more stringent than in the commercial sector.

Due to security concerns, however, suspicion regarding the use of open-source solutions within local authorities is still strong. Unfortunately, the fact that the advantages of using open-source solutions are much greater than the disadvantages is often not taken into consideration: With an open architecture, faults and errors can be discovered more quickly and the user is not dependent on any arbitrary actions or activities on the part of the software producer. Security is a particular strength of open-source software, because powerful security solutions are often developed in the open-source arena. On the Internet, almost all security mechanisms are based on open technologies such as SSL for encrypting web pages and PGP for encrypting email. The reasons for the dominance of open technologies includes the good reputation enjoyed by developers and the opportunity to develop innovative solutions from scratch, without having to take existing group or corporate structures into consideration. This as well as the cooperation and peer review within the community guarantee the software produced is of a very high quality. This is an enormous benefit to public sector administrations when it comes to their data centres and local installations.

Competent support

Open-source solutions also open up new possibilities for public sector administration because of their flexibility. However, a high degree of freedom also requires competent implementation and support. It may also be the case that a service provider has to build the required solution on a selected open-source platform. The big advantage of such a comprehensive customisation is, of course, that the client is ultimately presented with a better solution (and at a much lower cost than a commercial system would be) because it is a bespoke solution.

Of course, the IT department of a local, regional or national authority can handle part of an open-source project themselves, but as soon as it becomes more complex, public authorities (as well as private enterprises) are usually well advised to seek professional support. If an authority would like to undertake a large project – such as making an across-the-board change from MS Exchange to an open-source groupware package such as Zarafa – without the support of a suitably experienced service provider, it is unlikely they will be able to complete such a project successfully.
Reliable support, consulting and successful project implementation

- it-novum offers support models adapted to your individual business requirements. For the availability of your open source-based systems we also provide support when needed.
- The it-novum maintenance department supports you in the daily operation of your ITSM and can be measured against service level agreements (SLAs).
- As an IT consulting company with a profound technical know-how within the business open source area we differentiate ourselves from the big solution providers’ standard offerings. Our goal is to provide you with high quality consulting in all phases of your projects – from analysis and conception to implementation.
- it-novum can assemble multidisciplinary project teams, consisting of engineers, consultants and business data processing specialists. We help you to make a risk-free decision before project launch: with consulting workshops and proof of concepts for real-case simulation and prototyping.
- This enables you to decide for the best suitable new software and you profit from security and predictability, clear project methodology and sensible calculation.

Leading in Business Open Source solutions and consulting

it-novum is the leading IT consultancy for Business Open Source in the German-speaking market. Founded in 2001 out of the IT department of the KAP Beteiligungs-AG, it-novum today is a subsidiary of the publicly-held KAP Beteiligungs-AG.

We operate with 75 employees from our main office in Fulda and branch offices in Berlin and Vienna to serve large SME enterprises as well as big companies in the German-speaking markets.

it-novum is a certified SAP Business Partner and longtime accredited partner of a wide range of Open Source products. We mainly focus on the integration of Open Source with Closed Source and the development of combined Open Source solutions and platforms.

Due to the ISO 9001:2008 certification it-novum belongs to one of the few Open Source specialists who can prove the business suitability of their solutions, proven by international quality standards.
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