# Software Selection in an Open-Source-Oriented Government IT Department

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## Abstract

The City of Northglenn is a small municipality in Colorado. The City's IT department favors open source software and aggressively pursues open-source solutions for IT projects. This paper discusses the department's decision-making process, including the background of the decision makers, and some specific outcomes.

## The Obvious Motivation for Adopting Open-Source Software

The motivations behind adopting open-source software are several. The first and most fundamental is that it largely eliminates the costs of acquisition. Note that licensing costs are just a part of that. There is also the manpower behind software license research (e.g. 'Which version of this product should we license? Do we need per-CPU licensing? Was that per-core or per-socket? Enterprise or Server? How many CALs are required?' etc.) and license management (storage, tracking, retrieval) that is entirely avoided with open source. And, for many government agencies, the bureaucratic process of procurement can be long, complex, and not pleasant to navigate. Open source software, being freely available for download, jumps over all those hoops and make acquisition painless and free.

So given this major advantage, why haven't more governments adopted open-source software? The answers are less obvious.

## Barriers to Adoption

*Risk avoidance*. Fundamental to government employee culture is the notion of risk-avoidance. Going with a proven proprietary product, with a proven software vendor, is almost always the safest way to implement functionality. The government employees can call the vendor if anything goes wrong, and the vendor provides the technical experience to identify and fix the problem. Managing an open-source implementation often requires the implementing government employee to stand in the place of the software vendor. The employee is required to make sure that the implementation works properly and is also the one called when things go wrong.

*Lack of entrepreneurship*. Taking an open-source project from the Internet, learning the details of it, modifying it to suit an organization's needs, and supporting it is an act of an entrepreneurial spirit. It requires risk-taking, energy, a desire to learn and to grow professionally, and the expertise to support and enhance the application in-house.

*Employee skills, retention, and management*. As mentioned before, managing an open-source implementation often requires the implementing government employee to stand in the place of the software vendor. That means that the employee is on the hook for installation, upgrades, security, backup and recovery. Solid technical skills and understanding must be shown by the employee in order to make credible assurances to management that these processes are under control. Adding to the difficulty is that each open-source project may use a different set of technologies, incrementally increasing the technical burden on the IT staff and management.

While current economic trends may make finding employees with requisite skills easier, retaining them is a risk for managers. Managers must consider the costs and risks of employee attrition and replacement.

For many smaller organizations, both in government and the private sector, this issue of skills management is paramount. These organizations often use a strictly limited set of proprietary technologies and will exclude vendors from consideration whose solutions do not run on those technologies.

## Some Unobvious Motivations for Adoption

There are good business reasons for adopting open-source software within a government entity, and the barriers can be lowered or removed.

*Good stewardship of public funds*. A government organization that aggressively adopts open source software will see its software acquisition costs fall. If it can surmount the barriers identified above, software maintenance and service fees also fall to zero for those open-source implementations.

For example, many city governments record City Council meetings on video. They will often pay a firm to produce, encode, and host a small subset of those videos on the web for hundreds of dollars a month.

We at the City of Northglenn also hire a firm to record our council meetings. However, we encode and host those videos on the web using open-source software. Our video library is vast, going back many years, and marginal costs of hosting another video in perpetuity are almost unmeasurably minute.

*Good stewardship of public information.* A government agency that uses open-source software to store public information need never worry that the vendor will go out of business, or that the vendor will use its proprietary technology to extract large fees from the agency, In addition, because the software is open, the information contained within is also accessible, allowing easier integration with other software efforts. Open-source hosted information is never lost or made inaccessible.

*Rewarding work*. People who work with open-source software do it because they like it. Usually they get into the practice because it is fun and rewarding for them. They are often very competent and highly motivated, and would love to make their hobby into a paying job. They enjoy making things work and learning new things, and seek a job that would allow them to continue those practices.

Contrast an open-source implementation position with a 'defined skill set' job where the first diagnostic action is to reboot the server and the second is to call the vendor and wait in a telephone hold queue. It is easy to understand why open-source jobs are prized.

*Ever-expanding functions*. The universe of open-source software is expanding rapidly. Organizations that have the culture, the skills and the experience to take advantage of that universe can cheaply add functionality to their computing environments at a very low cost. Complex systems that used to be expensive are now freely available to such organizations. Examples include web content management systems, document imaging and management systems, intranet portals, file and print services, Voice Over IP services, and much more.

*It's not an either-or*. An organization that has there wherewithal to implement an open-source solution will almost always be capable of implementing a proprietary solution that is supported by a vendor, so following an open-source strategy does not close the door to proprietary software marketplace.

## The City of Northglenn IT Department: Background

In 2003 the City decided to aggressively adopt open-source software across the spectrum of IT services: Servers, desktops, and applications. The City hired an IT department head and a network administrator, both of whom were oriented toward open-source solutions. Later an open-source software developer was also hired. During the first few years the existing Windows server infrastructure was largely replaced with functionally-equivalent Linux servers which provided domain logins, file, and print services, and web services. Open source fax services, backup services, monitoring services and VOIP services were added later.

The City deployed several Linux desktops to less-technical users around the City. The City also added several open-source software packages to every Windows desktop deployed. These packages were OpenOffice for office productivity, the GIMP for image manipulation and creation, and PDFCreator for PDF conversions.

The City attempted to standardize on OpenOffice as the official office-productivity suite. That effort was met with resistance from the users. There were issues with training and change management, but more importantly there were interoperability problems when exchanging documents with other government agencies who had standardized on Microsoft Office. Eventually this standardization effort was dropped, but to this day the City continues to deploy OpenOffice on the occasional computer users in Parks, Streets, and Utilities so that the City doesn’t have to purchase a Microsoft Office license for those users..

During this period the City's IT department also deployed many closed-source proprietary software products when no credible open-source alternative could be found. These products included a municipal court system, a new financial system, a police record-management system, and a rec-center software package, among others.

Recently the IT department deployed nine flat-panel touch screen computers to the City Council Chamber. These computers are used by Council members during meetings to read email, browse documents and the web, and to cast official votes. These computers are Linux machines and are completely open-source.

## Case Study: A New Web Site

When the City's web site turned four years old an initiative was adopted to replace it. The requirements were to select a new content management platform and to deploy the site with a new artistic design. The IT department considered several options.

*Outsource.* The IT department received reasonable quotes from a software vendor that would deploy, artistically design, and host the City's new website. The vendor would be responsible for upgrades, maintenance, and security. The new site would be the vendor's proprietary platform and the IT department would not have access to any of the source code.

*Build in-house using open-source software.* The IT department had built the City's current website in-house using open-source platforms and considered doing the same thing again. The IT department was responsible for hosting the site and all upgrades and maintenance. However, budget shortfalls had reduced staff personnel since the previous site was built and certain artistic skills had been lost.

*Build in-house with vendor support.* The IT department considered using an open-source platform to build a new website, and then hiring an outside vendor to help with artistic design and with platform configuration. This new site would be hosted by the City and the IT department would be responsible for all maintenance, upgrades, and security.

The IT department met several times internally, with vendors, and with stakeholders in order to decide which path to follow. Quotes were collected from vendors and each option considered fell within the initial budget for the project so money was not a primary factor. The outsourced option was attractive as it provided the shortest time frame to a new web site. The downsides were a loss of control by the IT department and some minor technical shortcomings of the vendor's platform, and the on-going support costs. The in-house open-source option was preferred because it kept the site in the control of the IT department. Open source web platforms are very robust and powerful, but also very complex. However, the department felt that it could handle the complexity of the platform due to its recent success with other, similar platforms, including its current web site and its current intranet site. But because of personnel reductions the department was unsure of its ability to develop a high-quality web site on its own.

The department determined that the best option would be to develop and deploy and open-source based web site, using the popular Drupal content management system ([http://www.drupal.org](http://www.drupal.org/)). This platform was selected because of its energetic open-source community, its high-level of quality, polish, and functionality, and because of its common use in the Denver metro area. Department staff began self-training on the platform, joined a local user group, and attended a drupal conference. A vendor was selected and hired to assist Department staff with artistic design, with platform configuration, and with usability. The final site would be hosted and maintained by the Department.