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INDUSTRY VIEWPOINT:

The Future of Open Source in Government

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"Open Source is the most rapidly growing technology today. Within five years, 54% of CIO's surveyed, said Open Source will be their primary platform." CIO Weekly - March 3, 2003

What is Open Source?

Open Source refers to software, the license for which requires that its software code be open, extensible, and freely distributable. Such an open environment enables developers from around the world to share thoughts and ideas. This collaborative development allows for faster and more efficient review and testing, thereby helping to speed concepts to market. Developers then put these elements to use in custom-built software solutions that can be sold to consumers (businesses and government agencies) with less expensive, if not non-existent, licensing requirements.

In addition, using Open Source code results in products that are more easily adaptable to existing IT infrastructures.

Compare this to a proprietary software business model wherein a company covets its source-code as the way to generate licensing revenue. Creation of new ideas, as well as review and testing of software developments, are kept in-house or farmed out to select companies. Furthermore, proprietary software often stipulates certain

> *Access to the source code makes software easy to configure to specific user needs. Because open-source is freely distributed, it can greatly reduce the user's total cost of computing. Open-source software is reliable, stable, scalable, secure and extremely cost-effective.*
> *Source: Open Source Software Institute*

information technology (IT) requirements that force businesses and government clients to upgrade infrastructure. This adds additional layers of cost.

The Government IT Environment

It was once said that an army travels on its stomach, referring to the need for provisions. If trends in government spending can be considered an indicator, then it is arguable that government in the 21st Century travels by computer.

In fiscal year 2003, the U.S. Government budgeted more than $58 billion for IT products and services. More than 4 million desktops, laptops, and networked computers play essential roles in allowing federal agencies to achieve their goals. It is no stretch to see that the financial impact of government IT spending is now a matter of concern for administrators and taxpayers alike.

> *"Ultimately open source will become mainstream, not just the domain of "the four pony-tailed guys in the corner."*
> *- Rob Soni, a venture capitalist with Matrix Partners in Waltham, Mass. Source: Forbes, March 2004*

Virtually every computer within the federal government uses either an operating system or an application that runs on proprietary software. The associated licensing fees cost the government well in excess of $100 million annually.

Nationally, this is only the tip of the iceberg. According to the research firm IDC Corp., federal, state, and local governments combined spend upwards of $34 billion a year on software.

A Role for Open Source

The model of Open Source development combined with the scope of government IT needs results in several obvious benefits.

1. Cost Savings - Licensing Fees
Perhaps the most obvious reason for replacing proprietary software with Open Source applications is the potential for eliminating expensive licensing arrangements with firms that have no incentive to negotiate rates, regardless of the client's relative size.

2. Solutions vs Software
Organizations using Open Source solutions own the features and functionality of the software itself. This is the difference between buying a direct solution and a ready-made piece of software. Users are not dependent on outside forces to dictate the form, fit, and functionality of the application. With Open Source programming, the application received is precisely what the customer wants: nothing more and nothing less.

> *"Open source has numerous benefits, including breaking the relentless hold of technology lock-in, and cost savings in acquisition and life-time support costs,"*
> *-Lou Agosta, Forrester Research*

3. Speed to Deployment
Because the core elements of Open Source solutions are developed by a worldwide community of programmers and engineers working together, market deployment of these solutions is often quicker than proprietary business models. Open source developers working directly with consumers, in this case government agencies, can apply the best technology to meet the agency's immediate needs. Occasionally, good

developers do reinvent the wheel; however, the vast majority of Open Source solutions are not created from scratch. This "open" development model creates the ability to deliver final, working, and tested solutions faster and more efficiently.

4. Cost Savings - IT Investments

Because Open Source solutions are scalable and interoperable, they can make use of existing IT infrastructures. This flexibility allows for the deployment of solutions that are designed to work with multiple or existing systems, and which will preclude the necessity for costly upgrades in the future.

Open Source Standards & Security

Another significant benefit of Open Source that is rarely addressed is standardization. The Department of Justice estimates there are 16,000 different methods used by local governments to classify the same 300 bits of information in their databases. This is an ineffective and inefficient way to administer information and furthermore, is wasteful of tax dollars. Open Source applications are relatively low-cost and fast-to-market, and can be shared among organizations.

> *"IDC said last week in a market forecast briefing. Linux server sales of nearly $3 billion in 2003 are expected to rise to nearly $9 billion by 2007, according to market researcher IDC. Over the same period, IDC believes Linux server shipments will increase from about 800,000 to about 2.5 million."*
> *–Source: cNET , news.com*

In addition, Open Source solutions are secure. Prominent members of the financial industry, such as Merrill Lynch and Credit Suisse First Boston, use Linux "open" servers for transactions

Open Source Is Already Here

Open Source is not a new phenomenon. One of the world's most popular Internet companies, Yahoo, abandoned its own proprietary scripting language in favor of an Open Source solution. According to cNET, the move was prompted by "an eye towards its bottom line." This is only one small example. Open solutions are also used at Go.com, Netscape's Open Directory Project, LookSmart, Lycos, and across the web. In fact, it is estimated that almost half of all web sites currently run on servers using an Open Source-based system, such as Apache.

Open Source applications are growing in use throughout the private sector. Evidence of this is found in Hewlett-Packard's (HP) 40% revenue increase from the sale of servers with the Linux operating system and related support services. HP experienced sales of $2.5 billion in 2003, up from $2 billion in 2002. With 28.1% of the Linux-based servers sold worldwide, HP has invested heavily in Open Source. Moreover, IBM accounted for almost the same percentage of Linux-based servers sold. Since servers are normally deployed as one per application, many corporations and governments have assembled

> *"With the expansion of open source, the current reality is that users have a true choice between a variety of possible solutions to best accomplish their computing and networking goals."*
> *Source: USA Today, January 7, 2004*

large server farms, which have an average hardware utilization of 20% or less. Due to its ability to run on a wide variety of platforms, Linux is fast becoming the de facto operating system for servers and this year should surpass the number of Windows 2000 servers sold.

Open Source In the U.S. Government

A review of the current government IT climate shows the extent to which Open Source software has already become popular within the federal government. This is in addition to the fact that Open Source solutions were used to program and operate the two most recent NASA Mars rovers.

Historically, Open Source technologies had been discouraged within the Department of Defense (DOD). In 2002, MITRE Corp. found that at least 115 applications of Open Source origin, with 251 examples of use, were routinely utilized within DOD. Moreover, MITRE estimated that these findings represented just "the tip of the iceberg." The applications in use ranged from 25 examples of PERL scripting language, to 22 uses of Apache web server, to19 examples of Linux, to 3 examples of Red Hat™ Linux, to one example each of many other applications.

The same study revealed several other surprises. MITRE found that many DOD intranets depend heavily on Open Source, as does the department's software development. Open Source is used extensively in security applications, and research uses Open Source for the exchange of ideas and shedding of costs. Since Open Source had been discouraged within the department, why then was it being used at all? First, but not always foremost, is cost. The high capability-to-cost ratios are a powerful attraction. Second, many Open Source solutions are highly responsive. Third, there is a broader range of support options, from third-party to in-house to a combination of the two, with in-house providing support for critical components only. Security of the propriety software was often a concern, since only one major software firm—the respective vendor/developer—provided only after-the-fact security patches. This security model results in a weakness not being fixed until it has been exploited by a virus or a hacker. After reviewing the MITRE study, the Chief Information Officer of DOD put Open Source on equal footing with other commercial off-the-shelf products.

> *"Aside from developing its own wi-fi standard, China is actively promoting open-source computing to reduce its dependence on Microsoft Windows."*
> *Source: Asia Times, February 3, 2004*

Among federal agencies, the National Weather Service has deployed Linux on an estimated 2400 workstations and servers, resulting in savings of almost 75%, largely because the operating system requires less maintenance. Moreover, the National Weather Service plans to convert to Linux by year-end their systems at more than 122 forecast offices. The Census Bureau has developed a system to help citizens retrieve data using a variety of Open Source software applications, including Linux, Apache Web server, MySQL, and Perl (commonly referred to as LAMP).

Other agencies that are actively seeking Open Source solutions are the Defense Information Systems Agency (DISA), the Department of Energy, the Department of Education, the Department of Justice, and nearly every department in between. While the floodgates may not be completely open, clearly the wheel is turning and gate has begun to rise.

> *"On May 28th last year, The Department of Defense issued its memo entitled **"Open Source Software (OSS) in the Department of Defense (DoD)"**, which leveled the playing field for Open Source Software. As a result, to be used in the Federal government's market-based, heterogeneous IT environment, Open Source Software must provide best value for money, just like any other software product."*
> Source: The Center for Open Source & Government

> *"While Linux isn't poised to overtake Windows any time soon, the volume and strength of open source movements is nothing to scoff at. China, Japan, and South Korea have all leaped headlong into the movement, and other countries are contemplating taking the leap as well."*
> Source: Red Herring
> February 18, 2004

One Final Government Stamp for Open Source

Since Red Hat™ Advanced Server 2.1 has been approved as a Common Operating Environment for DISA, and SuSE's Enterprise Server 8 has been granted the Common Criteria Security certification, Open Source has now been approved to run on the nation's most critical computer systems: command, control, communications, and intelligence. Additionally, the National Security Agency has developed a security-enhanced version of Linux for use throughout the federal government.

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