Outstanding Open Source Applications In The Public Sector

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Vice President, Open Source Affairs
The State of ICT and Software, 2007

- More than $1T USD global IT spend (2004 estimate)
  - $500B USD SW+HW, $500B USD Services
  - $386B USD IT spend is wasted:
    - 18% of all IT projects abandoned before production
    - 55% of all IT projects “challenged” (late, broken, or both)

- More than 90% of leading IT vendors fail to achieve “good” rating for value from at least 80% of their top customers
  - Measured 3 years in a row

- Proprietary software model destroys 85% of the global innovation potential

- Average proprietary software has defect density 50x-150x higher than OSS
  - Measured 3 years in a row

- Conclusion: proprietary software is not sustainable

Embracing Change—Forever and Everywhere

- Zero-sum business hypothesis
  - Fixed resources
  - Equilibrium
  - Limited strategic options
  - Focus on core business
  - Self-fulfilling prophesy
    - Corp profits down
    - Tenure on S&P500 shorter
  - Firm working harder to create less value

- Positive-sum business hypothesis
  - Scalable resources
    - Compounding
    - Accelerating
  - Dynamic resource growth
    - Moore's Law (2x / 18 months)
    - Fiber Law (2x / 9 months)
    - Disk Law (2x / 12 months)
  - New strategic options
    - Competition→Complementary
    - Dynamic specialization
    - Connectivity
    - Leveraged Capability
Open Source Software

Better licenses make better software

- 10 requirements of the OSD (http://opensource.org/docs/osd)
- 60+ approved licenses (http://opensource.org/licenses/alphabetical)
- 100,000+ projects (http://sourceforge.net)
- 2M+ user-developers (http://flossimpact.eu)
- 1B SLOC doubling every 12.5 months (http://tinyurl.com/GrowthOfOSS)
- $1.8B combined revenues, accelerating growth to $5.6B by 2011 (http://www.idc.com/getdoc.jsp?containerId=prUS20711507)
- Runs computers ranging from smartphones to Google-scale supercomputers

“Now that we can do anything, what should we do?” — Bruce Mau, Massive Change
Necessity is the mother of invention...

The Long Tail of Open Source

- OSS achieved first article sooner...
  - With fewer bugs...
  - That were fixed sooner...
- The trend continues...
  - Xen Virtualization
  - SE Linux
  - GRASS/R/PostgreSQL
  - MySQL
  - JBoss ecosystem
  - Eclipse
  

Mapserver ([http://mapserver.gis.umn.edu/gallery](http://mapserver.gis.umn.edu/gallery))
M100 Galactic Nucleus

Hubble Space Telescope
Wide Field Planetary Camera 2

Wide Field Planetary Camera 1
Wide Field Planetary Camera 2
Now Open Source Software Is Pervasive

- Biggest OSS project: The Internet (http://www.ietf.org/)
- Smartest: Classified (Secured with NSA and Red Hat-developed SE Linux)
- Significant impact:
  - Weather Services: AWIPS (http://awips.raytheon.com/)
  - NASA (http://opensource.gsfc.nasa.gov/)
- Around the world:
  - Brazil's Software Livre (http://www.softwarelivre.gov.br/)
  - Denmark's Software Exchange (http://softwareborsen.dk/)
  - See http://osor.eu/ for comprehensive news and case studies in EU
Open Source GIS (http://tinyurl.com/OrchardPark)
From this

To that

Nasa's open source platform converts imagery to information
R Project + Census Data = Understanding

2004 US Election Data by County


Extra Credit: Better Automated Re-Districting Algorithm:
http://maltman.hmdc.harvard.edu/papers/bard.pdf
OLPC Bridging National Digital Divisions...

In Mali:

In Rwanda:
...and around the world

See for yourself: http://tinyurl.com/OLPC-Map-2008
From #1 in industry to a whole new industry

2006 Law S.2590 Section 2(b) IN GENERAL.—

(1) WEBSITE.—Not later than January 1, 2008, the Office of Management and Budget shall, in accordance with this section, section 204 of the E-Government Act of 2002 (Public Law 107–347; 44 U.S.C. 3501 note), and the Office of Federal Procurement Policy Act (41 U.S.C. 403 et seq.), ensure the existence and operation of a single searchable website, accessible by the public at no cost to access, that includes for each Federal award—

(A) the name of the entity receiving the award;

(B) the amount of the award;

(C) information on the award including transaction type, funding agency, the North American Industry Classification System code or Catalog of Federal Domestic Assistance number (where applicable), program source, and an award title descriptive of the purpose of each funding action;

(D) the location of the entity receiving the award and the primary location of performance under the award, including the city, State, congressional district, and country;

(E) a unique identifier of the entity receiving the award and of the parent entity of the recipient, should the entity be owned by another entity; and

(F) any other relevant information specified by the Office of Management and Budget.
USA Services Collaborative Wiki

Work from the following Open Source and Free Software projects/technology have been used in the creation of this Collaborative Work Environment (CWE) for our Community of Practice (CoP):

- Apache HTTP Server ([http://httpd.apache.org](http://httpd.apache.org)) (34)
- Bootstrap ([http://www.bootstrap.org](http://www.bootstrap.org)) (318Z)
- Fedora Project - Linux distro ([http://fedora.redhat.com](http://fedora.redhat.com)) (3190)
- Mailman ([http://www.list.org](http://www.list.org)) (36)
- mharc ([http://www.mhonarc.org/mharc](http://www.mhonarc.org/mharc)) (37)
- mhpurple.pl ([http://www.eekim.com/software/mhonarc/#sid03](http://www.eekim.com/software/mhonarc/#sid03)) (38)
- Namazu ([http://www.namazu.org](http://www.namazu.org)) (39)
- Postfix ([http://www.postfix.org](http://www.postfix.org)) (3A)
- Purple ([http://www.eekim.com/software/purple/index.html](http://www.eekim.com/software/purple/index.html)) (3B)
- PurpleSlurple ([http://purpleslurple.net](http://purpleslurple.net)) (3C)
- PurpleWiki ([http://www.blueoxen.org/tools/purplewiki](http://www.blueoxen.org/tools/purplewiki)) (3D)
- Python ([http://www.python.org](http://www.python.org)) (3N)
- Red Hat Linux ([http://www.redhat.com](http://www.redhat.com)) (3F)
- Subversion ([http://subversion.tigris.org](http://subversion.tigris.org)) (3G)
- TightVNC ([http://www.tightvnc.org](http://www.tightvnc.org)) (21G6)
- UseModWiki ([http://www.usemod.com/cgi-bin/wiki.pl](http://www.usemod.com/cgi-bin/wiki.pl)) (3H)
- VNC (see: [http://www.physiol.ox.ac.uk/Computing/Online_Documentation/VNC](http://www.physiol.ox.ac.uk/Computing/Online_Documentation/VNC)) (21G7)
USA Services IPR Policy

[A]ll contributions to this collaborative work environment shall be deemed to have been made under an open content license, open publication license or one of the free software or open source licenses. (See also: http://en.wikipedia.org/wiki/free_content)  (3PJ5)

- unless otherwise specified, content within this collaborative work environment shall be subject to the (cc) Creative Commons license(s), where the "by-nc-sa" license arrangement shall apply as a default, with the rights attributable to the author(s) making the respective contribution(s), and to the owner of this cwe.  (3PJ6)

- alternatively (in the event that the (cc) license may not be applied), this content herein shall be subject to the Open Content License (OPL), Version 1.0, July 14, 1998. (see http://opencontent.org/opl.shtml)  (3PJ7)

- those who are unable to contribute under the above licensing arrangements should refrain from contributing to the cwe content.  (3PJ8)

See also http://colab.cim3.net/cgi-bin/wiki.pl?WikiHomePage
Presently: USASpending.gov Last Updated July 22, 2008

Contracts data was updated for all 24 CFO Act agencies at this time.

Assistance data was updated for 9 of 24 CFO act agencies. Updates are currently pending for the following agencies: DHS, DOI, DOJ, DOS, DOT, EPA, GSA, HHS, HUD, NRC, NSF, OPM, SBA, TREAS, and VA.

Full transparency for $422,744,000,000 spending in partial FY2008

1. The name of the entity receiving the award;
2. The amount of the award;
3. Information on the award including transaction type, funding agency, etc;
4. The location of the entity receiving the award;
5. A unique identifier of the entity receiving the award.

Related citizen OSS projects: http://maplight.org/ and http://www.govtrack.us/
World Wide Web

The decision to make the Web an open system was necessary for it to be universal.

You can't propose that something be a universal space and at the same time keep control of it.

— Tim Berners-Lee, Creator of the World Wide Web

See http://www.w3.org/People/Berners-Lee/FAQ.html#What2
The Problem:
Here's what USMC Command and Control Systems look like today. A stovepipe mess, where systems don't talk or share information with each other.
The Solution:

Enable anyone to develop Incremental Capability and deliver it to the Warfighter through a defined system engineering process using JBOSS and RHEL.

Facebook did it for their application

Google went one better and created a System of System (SoS) Environment called OpenSocial for any application

Developers have to make tough choices between many different APIs.

OpenSocial enables developers to learn a single set of APIs and write applications that work in multiple places – minimizing work and maximizing distribution.

MAGTF C2 should be the Google-like platform for the Marine Corps!

Open to any vendor to deliver capability to all program applications
The Technology: JBOSS and RHEL
How?

Invaing armies can be resisted, but not an idea whose time has come
—Victor Hugo

Cracking the Nut presents [strategies] for introducing R to a social science department not necessarily ready to embrace it. It about not simply teaching R [http://r-project.org/], but finding a mechanism to insert it into the core of a department. It suggests the naïve assumption of R’s ‘self-sellability’ invites enormous frustration and almost certain failure. It argues that springing R on a department should be a campaign based on principles of military planning. It draws its occasionally offbeat lessons from the generally successful effort to integrate R in the political science department at the United States Naval Academy.

The key point is this: a successful R introduction does not resemble the entry of conquering heroes to the exuberant welcome of a liberated population. It is far more like an insurgency, fought fiercely behind the scenes.

—William Dubyak, US Naval Academy, 2008 useR! Conference
http://www.statistik.uni-dortmund.de/useR-2008/
The giant 400-pound Resonant pendulum can only be given tiny tugs with weakly attached magnets and strings. A big swing can result if the tugs are timed with the swing of the pendulum.
Proof:

<table>
<thead>
<tr>
<th>RANK 07</th>
<th>RANK 06</th>
<th>RANK 05</th>
<th>VENDOR</th>
<th>OVERALL 07</th>
<th>VALUE</th>
<th>RELIABILITY</th>
<th>WOULD CONTINUE TO DO BUSINESS (%YES)</th>
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<td>1</td>
<td>RED HAT</td>
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<td>93%</td>
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<tr>
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<td>-</td>
<td>-</td>
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<tr>
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<td>8</td>
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<tr>
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<td>70%</td>
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<tr>
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<td>8</td>
<td>10</td>
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<td>59%</td>
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<td>Cognos</td>
<td>51%</td>
<td>50%</td>
<td>52%</td>
<td>80%</td>
</tr>
</tbody>
</table>
Additional Case Studies and References

- State of Massachusetts: http://mass.gov/
- Atlanta Public Schools: http://blogs.zdnet.com/open-source/?p=2769
- City of Largo, FL use of Linux and Open Source: http://www.largo.com/department/index.php?fDD=24-0
- NCOMS - example of an application consortium using OSS to build shared apps: http://ncoms.us/
- Backgrounders:
  - http://www.govtech.com/gt/128089?id=128089&topic=117691&story_pg=1
### Protection v. Innovation

<table>
<thead>
<tr>
<th>Developer 1</th>
<th>Developer 2</th>
<th></th>
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<tbody>
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<td>v, v-c</td>
<td></td>
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<tr>
<td>Work</td>
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<td>v-c, v-c</td>
<td></td>
</tr>
</tbody>
</table>

- **v**: value to developer
- **c**: cost to developer

#### Game theory predicts:
- More modules and more option value leads to more developers

http://www.people.hbs.edu/cbaldwin/DR2/BaldwinArchPartAll.pdf