Open Technology: Realizing the Vision

Conference Overview (March 2007)

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Best Practices Committee Meeting @ NSF

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http://opentechdev.org

Web 2.0 made possible by:

Open Source Source,
Open Interfaces & Standards
Open Technology Development practices

Web 2.0 Definitions*

Core competencies of Web 2.0 companies:

- Services, not packaged software, with cost-effective scalability
- Control over unique, hard-to-recreate data sources that get richer as more people use them
- Trusting users as co-developers
- Harnessing collective intelligence
- Leveraging the long tail through customer self-service
- Software above the level of a single device
- Lightweight user interfaces, development models AND business models

* Tim O'Reilly, Sept 2005, http://www.oreillynet.com/lpt/a/6228

Conference Keynotes

Day 1: OTD

- Chuck Riechers, Principal Deputy Assistant Secretary of the Air Force for Acquisition
- Chris DiBona, Open Source Manger, Google
- BG Nickolas G. Justice, USA, Deputy Program Executive Officer Command, C3T
- Ted Davies, Unisys Federal Civilian Business

Day 2: Open Source Geospatial

- Michele Weslander, Principal Deputy Associate Director of National Intelligence and Deputy Chief Information Officer in the Office of the DNI
- Tyler Mitchell, Executive Director, Open Source Geospatial Software Foundation
- Dave McIllhagga, CEO, DM Solutions
- Geoff Zeiss, Autodesk, Inc.

This Is What We Want: Agility

This Is What We've Got

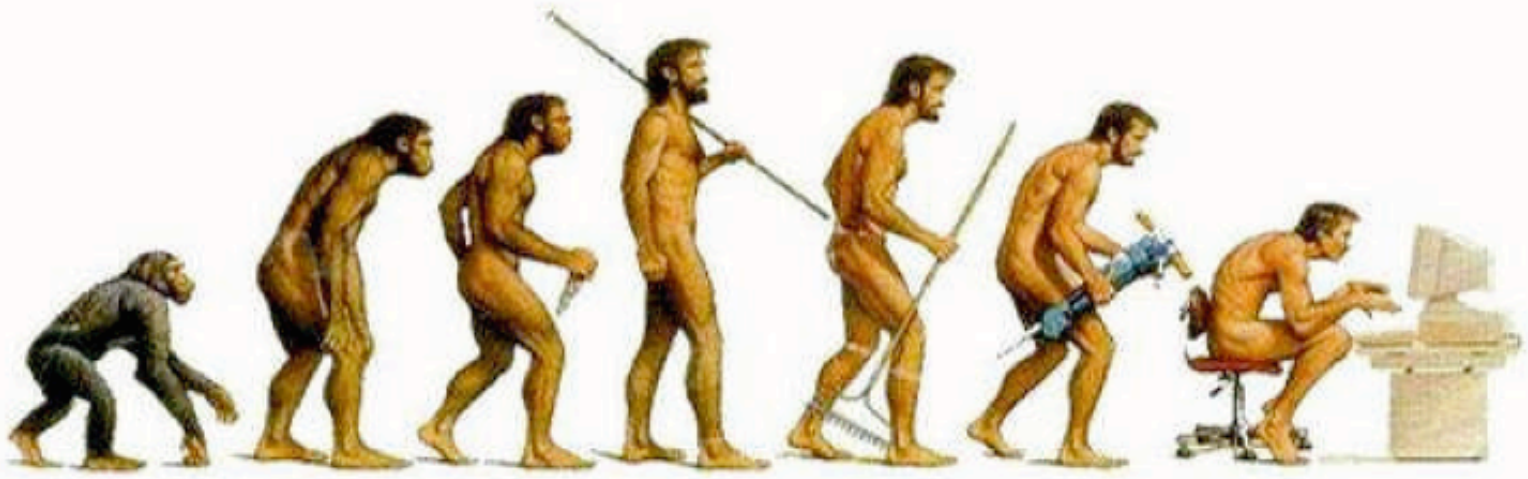
Chuck Riechers, AF

"Our goal is to increase technical efficiency and reduce software lifecycle costs within DoD," said Chuck Riechers, Principal Deputy, Assistant Secretary of the Air Force for Acquisition. "The Open Technology Development roadmap sets out a strategic vision that encourages the use of open standards, open data interfaces and best-of-breed open source software solutions when and where appropriate.

"We are not mandating that it's either "open" or "proprietary" solutions," he continued **"We want to pay for unique intellectual property when they are best of breed, but not succumb to code and vendor-specific lock-in situations.** Acquisition of proprietary solutions needs to be a conscience choice, not an assumption. The default should be "open technology development," where standards and interfaces are open and accessible and best of breed software is utilized, all coupled with the Air Force exercising data rights. Further, we need to move toward an increased competitive, collaborative and interoperable environment across the Services and industry for technology development. This strategy will help to minimize redundant development efforts and enable more agile development and deployment of systems."

Strategy

1. Crawl
   - Open Standards, Interfaces, Data
2. Walk
   - Open Source & Concept Methodology
3. Run
   - Air Force/DoD/Industry Source Repositories



What's Happening in DoD

Open Technology Development (OTD)

- **Promote:**
  1. **Open Standards, Open Data, Interfaces – enable systems and services to evolve**
  2. **Use of best-of-breed Open Source Software**
  3. **Open Source Software Development Practices and Solutions – minimizing redundant software development and enabling a more agile development of systems**

OTD is about fostering *collaboration* across DoD on technology acquisition and development

No doubt changes in the way we do business are necessary

Open Standards – The 'Easy' Part

- Establish the foundation and rules
  - Adopt open standards and defined interfaces
  - Pursue open data policies
  - DoD can't be the big gorilla
- Efforts must consist of influencing existing community standards - avoid creating new ones
  - May need to do so for DoD unique situations (weapons, etc.), but should be the *exception*
- Gets us 'close enough' to what we need
  - Deal with unique needs and requirements if they are truly unique

"First, do no harm"

Open Systems Architecture/ Open Standards

- Simply expected – but it won't happen overnight
- Proprietary is OK so long as it's an informed decision – not a blind default that creates unanticipated lock-in.
  - We *want* the best of breed – if you have a great new idea, you should be rewarded
  - Thorough interface and performance specs are critical – they will be deliverables
    - Don't need to know the details of what goes on in the box (competitive advantage), but need to describe the functionality in sufficient detail to allow someone else to swap in
- Compete on functionality and service

"It's the interfaces, stupid!"

Open Source Concepts & Methodology on the Industry Side

- Development environment and business process
- This is good engineering practice: take something that works, modify for your purposes
- It isn't that hard, but requires a culture change
  - (and the tide is turning…)
- Like any other learning process – crawl, walk, run
  - Have to start small and go forward – some of the culture change begins with how we contract for software/code development

"Innovate or die!"

The Road Ahead

(as if all that wasn't enough)

Parting Shots

- Systems deployed inside enemy's OODA Loop
- Large and long new starts thing of the past
- Agility, Agility, Agility

Industry tell us how you do it - In 60 days we would like to hear how suppliers can help us get to our goal

We're willing to listen and want to engage – your place, or ours!

Nobody said it would be easy…

Chris Dibona, Google

- We couldn't build Google without open source software

Government Panel

Panel: Architecture & What's Ahead for DoD Open Source?

- Tim Johnson, US Navy - CIO Org
- MAJ Jim Jackson, JFCOM
- Fritz Schultz, DISA
- David Wheeler, IDA
- Nick Guertin, US Navy PEO IWS 7

Nearly all OSS is Commercial Off-the-Shelf (COTS)

- **Federal Acquisition Regulation (FAR) prefers COTS and NDI; commercial item = "licensed to general public":**
  - Agencies must "(a) Conduct market research to determine [if] commercial items or nondevelopmental items are available … (b) Acquire [them] when… available … (c) Require prime contractors and subcontractors at all tiers to incorporate, to the maximum extent practicable, [them] as components..."
  - Commercial item is "(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes [not unique to a government], and (i) Has been sold, leased, or licensed to the general public; or (ii) Has been offered for sale, lease, or license to the general public... (3) [Above with] (i) Modifications of a type customarily available in the commercial marketplace; or (ii) Minor modifications… made to meet Federal Government requirements. "
  - True for nearly all off-the-shelf (OTS) OSS, so it's commercial item/COTS
- **OSS projects usually seek improvements = financial gain**
  - U.S. Code Title 17, section 101 defines "financial gain" as including "receipt, or expectation of receipt, of anything of value, including the receipt of other copyrighted works."
- **Many OSS projects supported by commercial companies**
  - IBM, Sun, Red Hat, Novell, Microsoft (WiX, IronPython, SFU, Codeplex site)
- **Often developers paid (2004: 37K/38K Linux changes)**
- **OSS licenses and projects approve of commercial support**
- **Use COTS/NDI because *users share costs* – OSS does!**

Why would governments use or create OSS (value for government)?

- Can evaluate in detail, lowering risk
  - Can see if meets needs (security, etc.)
  - Mass peer review typically greatly increases quality/security
  - Aids longevity of records, government transparency
- Can copy repeatedly at no additional charge (lower TCO)
  - Support may have per-use charges (compete-able)
- Can share development costs with other users
- Can modify for special needs & to counter attack
  - Even if you're the only one who needs the modification
- *Control own destiny*: Freedom from vendor lock-in, vendor abandonment, conflicting vendor goals, etc.

In many cases, OSS approaches have the *potential* to increase functionality, quality, and flexibility, while lowering cost and development time

Open Architecture is an enabler for meeting this goal

***Naval Open Architecture** is an enterprise-wide, multifaceted business and technical strategy for acquiring and maintaining National Security Systems as interoperable systems that adopt and exploit open system design principles and architectures.*

OA CORE PRINCIPLES

- Modular design and design disclosure
- Reusable application software
- Interoperable joint warfighting applications and secure information exchange
- Life cycle affordability
- Encouraging competition and collaboration

Source: OPNAV ltr Ser N6N7/5U916276 dtd 23 Dec 05

We are moving forward with our OA business model

- The Navy seeks to receive and assert Government Purpose Rights (GPR) in all National Security Systems it develops and acquires
- The Surface Navy has established the Software Hardware Asset Reuse Enterprise (SHARE) library in which these assets will be deposited
- GPR will enable the Navy to share these assets with all qualified contractors who sign up to access SHARE
- The SHARE agreement requires that modifications to SHARE assets be redeposited into the library
- However, SHARE is only accessible to qualified contractors. It is not available to the general public.

More information on SHARE is available at https://viewnet.nswc.navy.mil

BG Justice, C3T

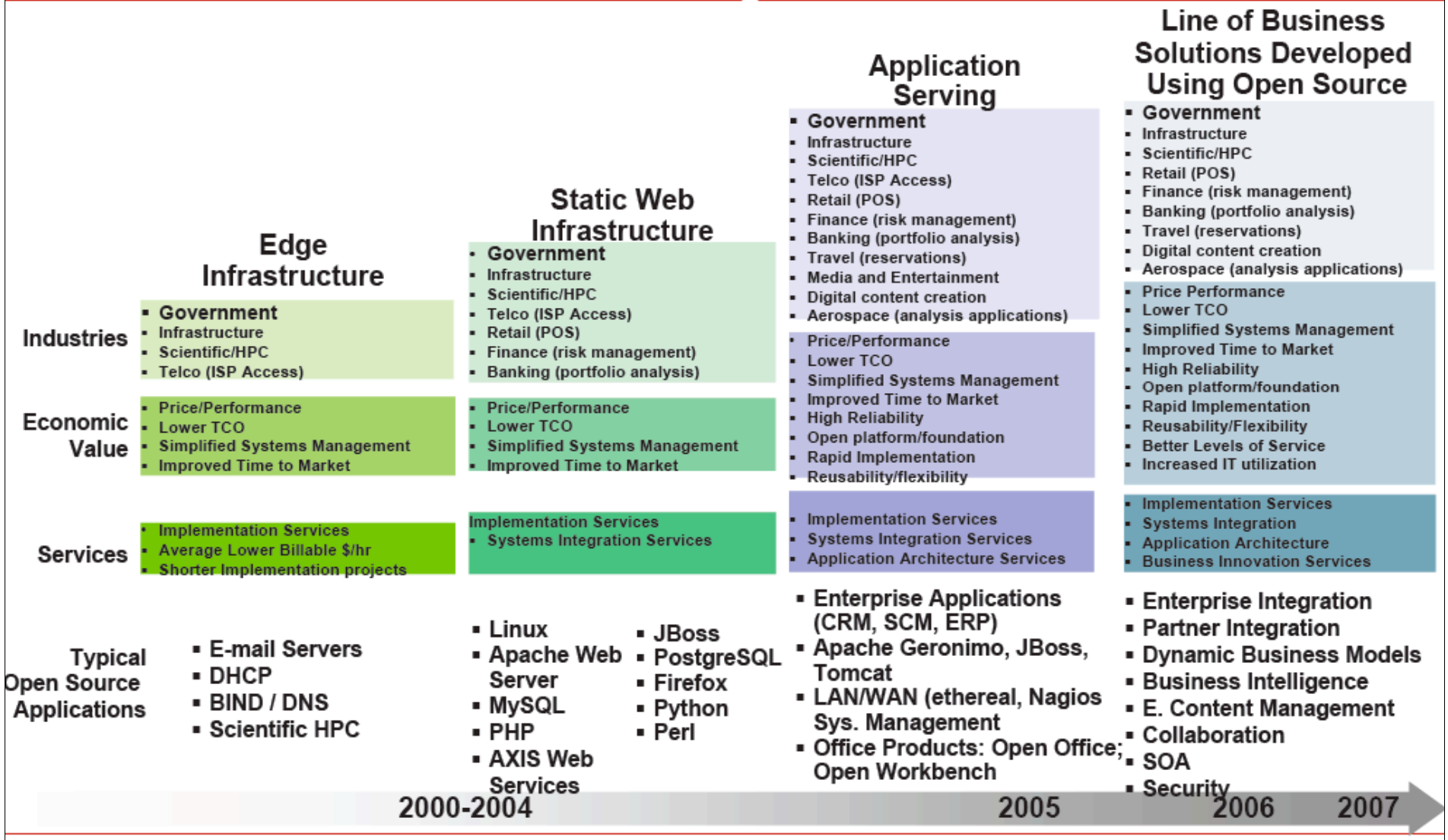
"Our job is to provide accurate and timely information to the soldier in the field so they can perform their mission," said General Justice. **"Open source software is part of the integrated network fabric which connects and enables our command and control system to work effectively, as people's lives depend on it**.

"When we rolled into Baghdad, we did it using open source," General Justice continued. "It may come as a surprise to many of you, but the U.S. Army is "the" single largest install base for Red Hat Linux. I'm their largest customer."

Industry Panel

- Andy Gordon, Unisys
- Gary Long, Enterprise DB
- Chris Runge, Red Hat
- Bill Moriarity, Black Duck
- Ken Lorentzen, Boeing FCS
- John Smith, Hewlett Packard
- Drew Ladner, ZURI Technology

Open Source Enterprise Applications Evolution Beyond Linux



Progress since the 9-14-2006 OTD Conference

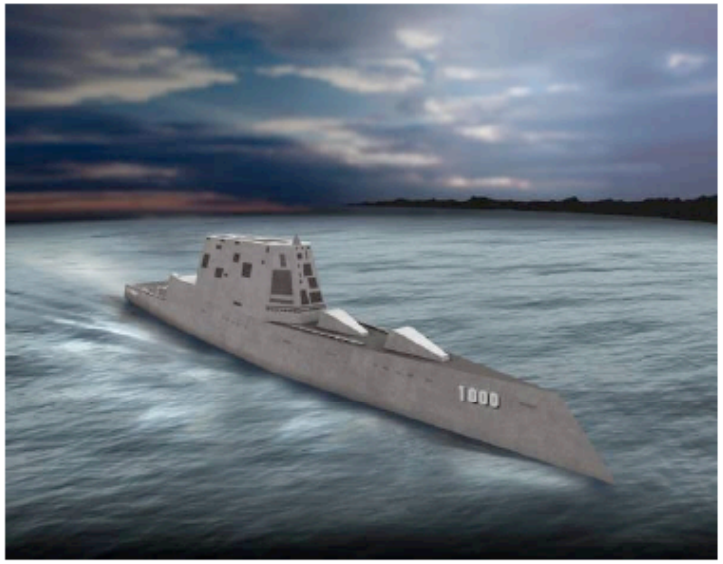
The Contractor shall promote the use of open source solutions and open technology development where practicable to enable this re-use.

GSA Alliant (Fall 2006)

redhat.

DDG-1000 and TSCEI

- Next-generation destroyer
- Requirement: open and standardized platform, with sustainable and reusable technology for the long-term
- One OS for a variety of ship-based needs
  - C&C, navigation, targeting, weapons control, radar systems
  - Enhances manageability and survivability
- Red Hat, IBM, Raytheon
  - Red Hat Enterprise Linux with enhanced Real-Time capabilities
  - Real-Time Java



Ted Davies, Unisys

- **There is huge opportunity here for industry & government**

Michele Weslander, DNI

"Speed, efficiency and flexibility are essential in the business of Intelligence gathering," Weslander said. **"One of the key advantages of using open technologies within geospatial programs is that it promotes interoperability** which broadens the resource base which we have to draw from regarding both informational data and the tools and service providers which collect and process the vast amounts of information involved in satellite mapping and information sharing."

Open Source Geospatial

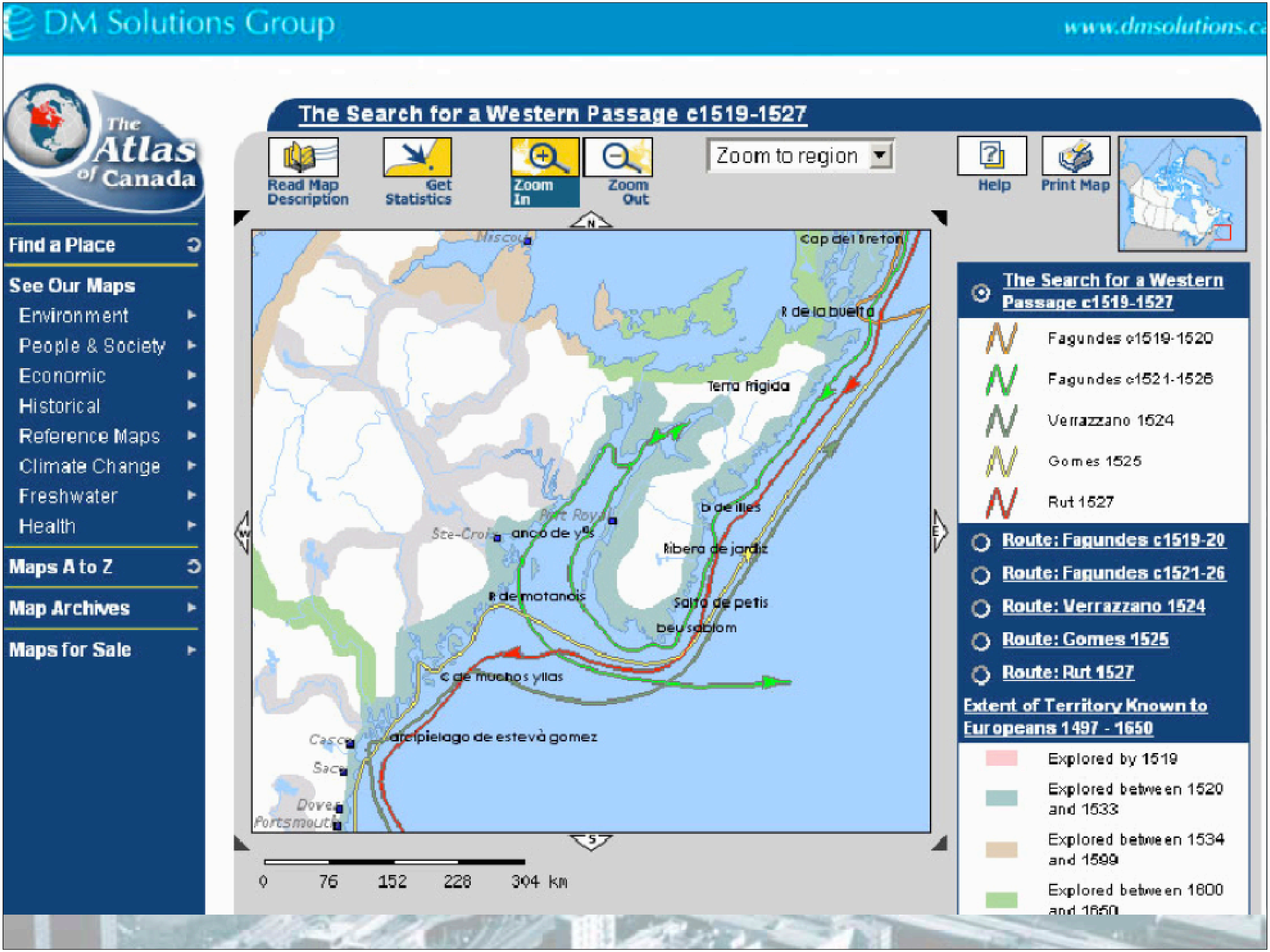
- Tyler Mitchell, Executive Director, Open Source Geospatial Software Foundation
- Dave McIllhagga, CEO, DM Solutions

What's Ahead for Open Source Geospatial Software?

- Jim Long, National Geospatial Agency
- Al Kelly, I Labs, Inc.

Finding the Role for Source Geospatial Software

- Geoff Zeiss, Autodesk, Inc.
- Large DATA JCTD/OSSIM
- Mark Lucas, RadiantBlue



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Freshwater
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Maps A to Z
Map Archives
Maps for Sale
The Search for a Western Passage c1519-1527
Read Map Description
Get Statistics
Zoom In
Zoom Out
Zoom to region
Help
Print Map
Cap del breton
R de la buelta
Terra frigida
b de illes
Port Royal
Ste-Croix
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Fagundes c1519-1520
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Verrazzano 1524
Gomes 1525
Rut 1527
Route: Fagundes c1519-20
Route: Fagundes c1521-26
Route: Verrazzano 1524
Route: Gomes 1525
Route: Rut 1527
Extent of Territory Known to Europeans 1497 - 1650
Explored by 1519
Explored between 1520 and 1533
Explored between 1534 and 1599
Explored between 1600 and 1650

What makes this work?

- Value is in the **Solution**, not the Technology
  - Web Mapping is an empowering tool for solutions delivery
  - Web Mapping technology has little value in itself
  - Why impose a barrier to adoption and innovation on something with relatively little real value?
- DMSG Motto

  "**Solutions Drive the Technology – Not the other way around**"
- The Value Gap between End Solution and Technology is ENORMOUS … that leaves room for business to flourish

Business Models

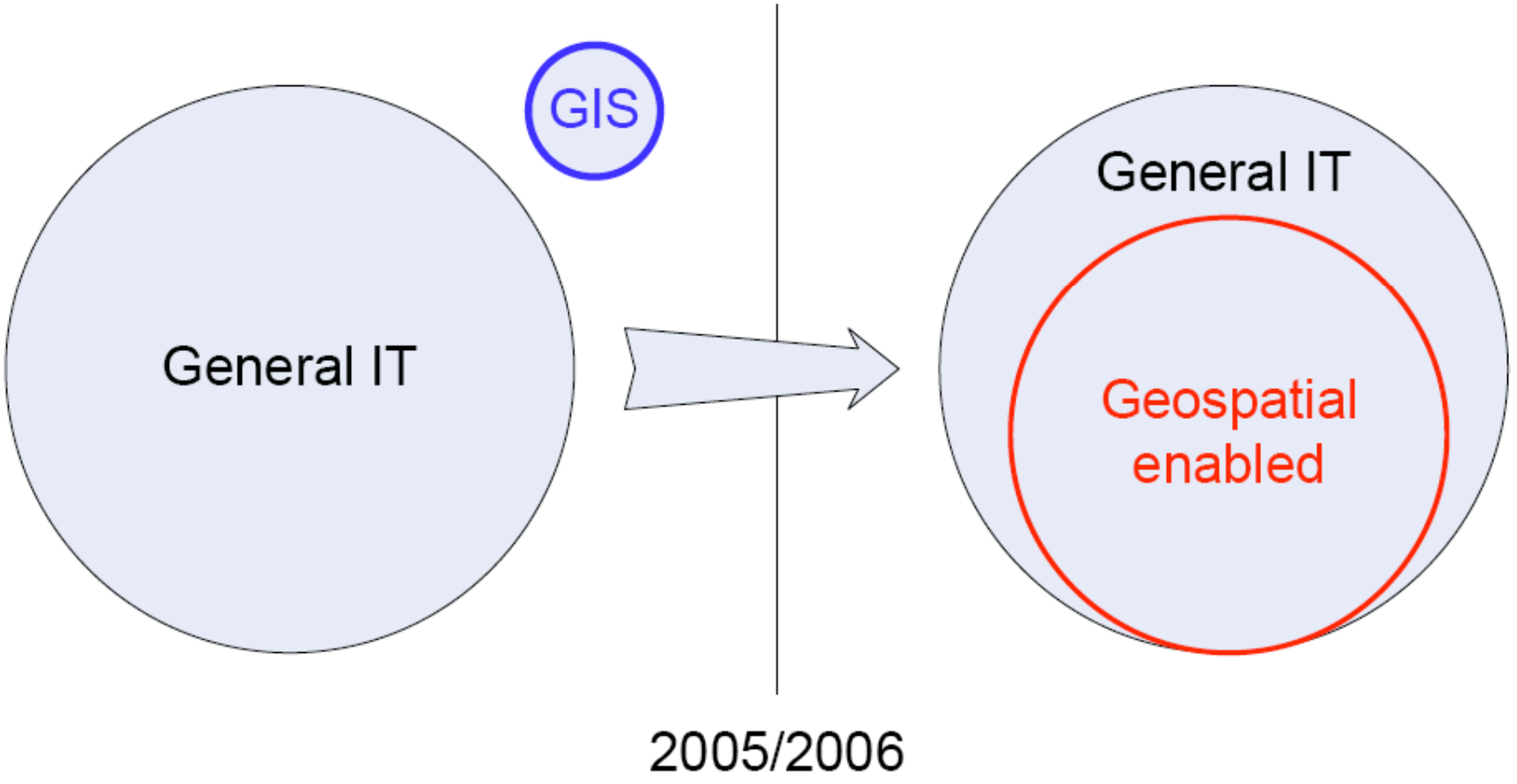
The Open Source Web Mapping Business Ecosystem

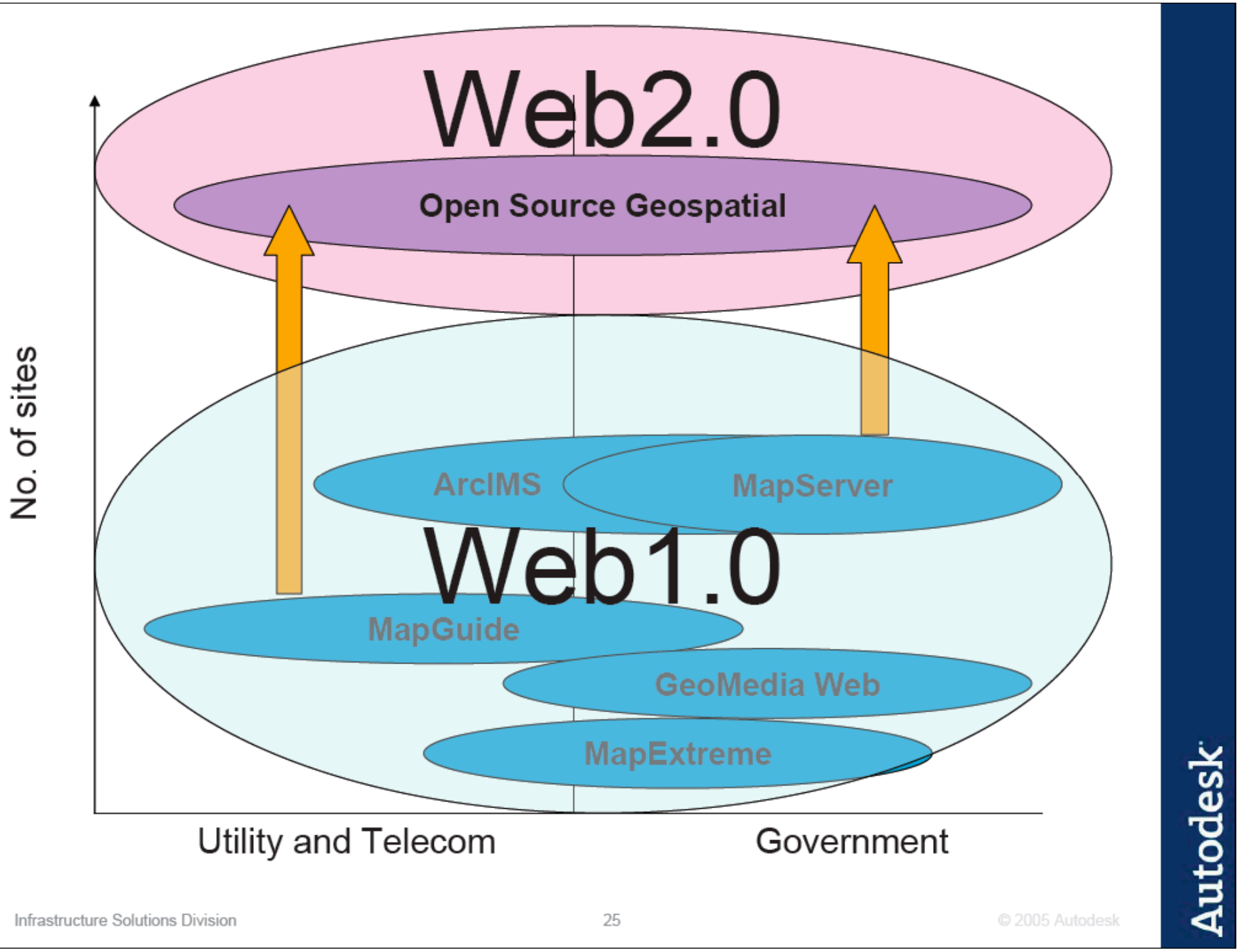
- **The Caretakers** - Horizontal focus, servicing users of open source web mapping technology
- **The Professionals** - Consulting & System Integrators, deliver custom solutions
- **The Specialists** - Vertical / Domain Market specialists, deliver repeatable solutions

State of the GeoSpatial Universe

- Web technologies have been the primary disrupter to how geospatial technologies are used and applied
- Traditionally GIS departments have performed all geospatial activities and delivered end-results to 'users' as map products, reports, etc..
- Introduction of Web mapping technologies has allowed 'users' to engage in this process of geospatial information delivery
- The result is a disruption to how geospatial data and information is created, managed accessed, and distributed

Trend: Geospatial-enabled IT





Summary

Open standards create a fertile ground for commoditization.

Open source is good at commodity software.

- http, html -> Apache Web Server
- OGC OWS -> MapServer

Web mapping is becoming commoditized

- Open source used by ~50% of the world's map servers

Web 2.0 and open source web mapping is a business opportunity

- Bigger pie

Autodesk

in closing...

Acquisition of proprietary solutions needs to be a conscience choice, not an assumption.

- Chuck Riechers, AF