# The Business of Open Standards in the E&P Industry

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# Something for a businessman to think about

- Business opportunity
  - Consumers
  - Suppliers
- Business proposal
  - Description
  - Example
  - Issues
    - Barriers
    - Effectiveness
    - Winners & losers
  - Business models
- A final thought

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# "geoscientists and engineers spend between 30-60% percent or more of their time trying to find, qualify and correct data"

$500 million/yr in lost productivity, or more importantly
$5 billion/yr value not created

\* - George Kronan, Landmark Division, Halliburton Energy Services, www.lgc.com/Landmark/resources/
solutions+newsletter/2004/solutionsq4_2004.pdf

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The rate of innovation in subsurface data processing, visualization and storage is slow compared with other industries (PC and console gaming, defense, medical imaging, etc.)

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# The market is large and growing (suppliers)

Geophysical software and processing
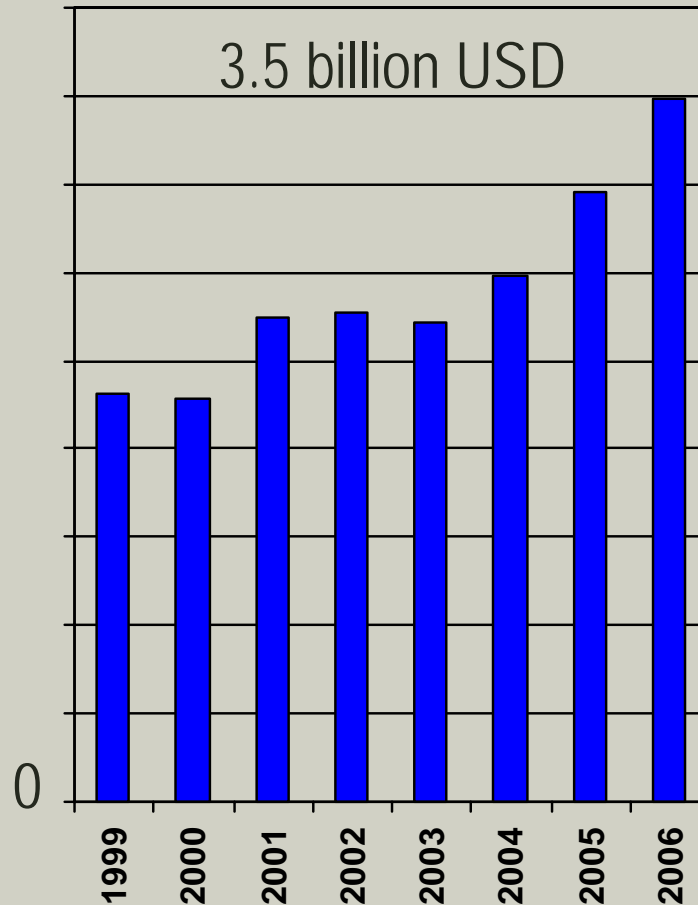
3.5 billion USD

- With potential
  - Top 4 majors have generated $200 billion USD over same period
  - Innovation could grow it 5 fold

(source Spears & Associates)

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# Growth going to the innovative and market wise (suppliers)

- Approaching a status-quo in functionality with competition focused on price, compatibility amongst largest players
  - Lack of cross-platform communication creates high lock-in among customer base
  - Despite Schlumberger's Western GECO's growth, the company's market share has fallen 10% since 1999
    - SLB moving toward higher margin work
    - Giving up market share is a strategic choice
  - Halliburton market share has only grown 25% since 2001
- Faster growth is seen in companies meeting unsatisfied demand
  - Innovative solution
    - Veritas and Petroleum Geo-Service have doubled their market share since 2001
  - Ignored niche market
    - Dawson Geophysical has doubled their market share in the past year
    - Dawson benefited from Schlumberger's decision to abandon the US land seismic acquisition market

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# The proposal

- A clue to the proposal
  - Large oil companies very reluctant to consider deviations from standard computing platforms or continue to embrace their "home-brewed" platforms
  - NOC and small independents are increasingly moving towards Linux-based open source software environment
    - Fear imperialism of oligarchs

- The proposal:
  - Open source software development of an open standard for:
    - Inter application communication (operating system)
    - Data communication

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# What is Open Source Software Development?  a community

- Open Source Software Development (OSSD) is a community-building process
  - not just a technical development process
- OSSD peer review creates a community of peers
- OSSD processes iterate daily versus infrequent singular (milestone) software engineering events
- OSSD depends on frequent, rapid cycle time (easier to improve) vs. infrequent, slow cycle time of proprietary released software (harder to improve)
- An OSSD project defines a living, evolving technical standard

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# Open Source Software Development: here to stay

- OSSD is different than proprietary software engineering
  - Not better, not worse, but different
- OSSD, once considered revolutionary, is now very commonplace
  - Redhat-Linux, IBM-Eclipse, Sun-NetBeans and OpenOffice, HP-Gelato, Apple-Darwin, Microsoft Research-Rotor, SAP-DB, etc.
- More social, more accessible, more transparent
- OSSD systems don't need and probably won't benefit from classic software engineering management
- OSSD has a well-defined culture (values, norms, and beliefs)
  - GNU Public License (GPL) for free software
  - More open source licenses (http://opensource.org)

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# Where is an open, not proprietary, solution likely

|  | Low Economies of Scale | High Economies of Scale |
|---|---|---|
| **Low Demand for Variety** | Unlikely | **High** |
| **High Demand for Variety** | Low | Depends |

Source: <u>Information Rules</u>, pg. 188, Carl Shapiro & Hal R. Varian

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# Economies of scale enabled by an Open Standard

- Demand-side economies of scale
  - "Network Effect"
    - Metcalfe's Law = Power of Net = Nodes$^2$
  - Performance / Productivity Increase
  - Compatibility
  - Evolution & Migration Path
- Supply-side economies of scale
  - Consolidated platform
  - Independent distribution channels
  - Value-driven pricing

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# Virtues of a Open Standard

- The GPL/BSD qiWorkbench$^{TM}$, as an example, delivers:
  - An inexpensive subsurface data visualization system free of proprietary "lock-ins"
  - A flexible system wherein additional qiComponents$^{TM}$ or "plug-ins" may be added, as needed
  - A compatible subsurface data processing system with the ability to "speak" the proprietary data formats of other vendors via qiComponent qiSevices.
  - A transparent technology whose source code is available to the entire user community
  - A technology that give the operator freedom of choice between compatible, interoperable applications from multiple manufacturers

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# Barriers to Open Standard

- Market competition — monetary-political forces
    - Halliburton (Landmark), Schlumberger (Petrel), etc.
    - Allied vendors for services & products (Open Spirit)
    - Bundle-based pricing vs. a-la-carte pricing
- Installed base inertia
    - Switching costs – compatibility and translation costs
    - Redevelopment costs – managing high-cost, customized packages
- Social barriers — human inertia
    - Indifference and learning curves
    - Status quo & laziness
    - Company & individual compartmentalization: Geologists, Geophysicists, Petrophysicists, Drillers, Reservoir Engineers, Production Engineers; Exploration vs. Production Operations; US, Europe, Africa, Middle-East, Asia
    - Resistance to change-for-sake-of-change
    - NIH – not invented here
    - Technological religion – speaking heresy

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# Effectiveness of an Open Standard

- Standards enhance compatibility and interoperability, generating value for users by making the network larger
  - A large network is a great benefit to consumers (examples of interoperable format standards include DVD, VHS, 3.5" hard disks, 802.11g WiFi and GSM cell phone standard)
- Standards reduce the lock-in technology risk faced by consumers and thereby accelerate acceptance of the (revolutionary) technology
  - Incompatible products, consumer confusion and fear delay technology up-take and adoption (that surrounded the Picture Phone in the 1970's and AM stereo in the 1980's)
- If the standard is managed as a (quasi-) open standard (like MPEG or Mozilla browser), the risk of emergence of a new competing standard will be low
- A pervasive standard leads to fewer compatibility problems and stronger network externalities
  - … But can also reduce the ability of a supplier to differentiate its products, resulting in increased price competition and increased speed of innovation
- Company like BHPB who competes on basis of quality of their people and their know how is strategically aligned with good open standard

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# Winners and losers of Open Standards

- Consumers (winner) - they welcome being spared of having to pick a winner and face the risk of being stranded
    - Enjoy network effects and interoperability
    - Can mix and match components to suit their needs
    - Are less likely to become locked into and held hostage by a single vendor

- Complementors (winner) - sellers of components welcome standards so long as their products comply with them
    - Record companies enjoy licensing revenues from iTunes, a complementary product offering to the Apple iPod
    - When sales of iPods increase, demand for iTunes also increases
    - Imagine downloading qiComponents that you need from qiComponent.org or qiCompnent.com

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# Winners and losers of Open Standards (continued)

- Innovators (winner) – companies and individuals developing and applying new technology collectively welcome standards because they expand the total size of and access to the market
  - if a group of innovators all benefit from setting a standard but do so in different ways, complex and protracted negotiations could result
    - As did between the US, Europe and Japan relating to HDTV
- Incumbents (depends) - have one of three choices:
  - Deny backward compatibility to entrants with new technology
    - AT&T tried this with their network switches in the 1970s and forced MCI to sue, resulting in the famous break-up of Bell Telephone (loser)
  - Rush to introduce new equipment or standard
    - Atari tried to do this unsuccessfully with their 7800 video game system when faced with Nintendo's entry into the video game market (loser)
  - "Join 'em" and ally itself with the new technology
    - Sony and Philips did with the CD and DVD (winner)

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# Making money with an Open Standard

- "Shrink wrap" packaging and maintenance
  - Think Red Hat

- Web distribution
  - Think iTunes, Amazon.com (qiComponent.com)

- Content providers
  - Think CNN.com, independent musicians (qiComponent makers, technical innovators)

- Service providers
  - Think eBay, eHarmony.com (qiServices.com)

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# Open Standards - not if, but when

- Need is obvious and significant
- Tipping point will be reached
- Accelerated if we work together

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