



The Open Source Ecosystem Matures: Observations and Recommendations

RFG believes the open source ecosystem – open communities, standards, and technologies – has matured significantly, to a point where there are growing numbers of business solutions delivering real business value today. At the same time, more and more IT and business decision-makers are identifying, pursuing, and succeeding with initiatives that employ elements of that ecosystem to achieve meaningful immediate and sustained business benefits. IT executives must take a business-centric, holistic, and pragmatic approach to the open source ecosystem to take maximum advantage of relevant elements while avoiding the risks associated with unnecessary or irrelevant elements. As part of that effort, IT decision-makers should investigate and assess the open source strategies of key vendors at their enterprises. IT executives should ensure that these align closely with enterprise goals and requirements, and with current and planned strategic IT initiatives, whether these involve open source technologies or not.

Business Imperatives:

- As open source solutions, technologies, and vendors evolve, **the open source and proprietary/closed source ecosystems are increasingly converging**, each picking up ideas from the other. For example, open source vendors are increasingly focused on providing "enterprise-class" interoperability, service and support and are moving to more traditional business models, while many vendors of proprietary solutions are now also selling offerings based on free and/or open source technologies, and leveraging community development as well. This continuing convergence underscores the need for IT executives to evaluate candidate open source solutions and their vendors using the same criteria by which proprietary and closed source alternatives are measured.
- The open source ecosystem continues to expand as it evolves. **Open source is now much more about open communities and implementing open standards.** IT executives must therefore ensure that they and other enterprise decision-makers look beyond elements such as Linux and access to source code. They must instead look more broadly, directly, and specifically at the business value propositions of all elements of that ecosystem, adopting those that make business sense. IT executives should also evaluate current and candidate vendors and their solutions similarly, and be careful of open source projects where the community is not open but controlled by a single vendor.
- The growth and evolution of the open source ecosystem has shifted the priorities and importance of key elements of that ecosystem. **Integration and interoperability**, among open source solutions and between them and other IT infrastructure elements (including closed source and proprietary solutions) **join support as key challenges**, and potentially very significant business benefits, to solution providers as well as to enterprises. These issues represent key differentiators, more important than any particular technologies, whether open source or not. Customer environments are increasingly likely to be a heterogeneous mixture of open source and closed source. IT executives should ensure that their own strategies and those of their vendors address these issues adequately, to maximize business value and alignment.

Challenges and Requirements

At an "Open Source Think Tank" held in March 2007, 102 individuals from 81 organizations, including 32 chief executives and 16 CTOs/CIOs, discussed the current state of and future prospects for enterprise open source solutions. Participating organizations included **IBM Corp., Microsoft Corp., Novell, Inc.** and other leading enterprise IT solution vendors, as well as emerging vendors, enterprise users, industry analysts, and others. According to a post-event report summary issued by the event organizers, participants' perceptions had shifted sharply compared to those expressed at a similar event held a year earlier. While there was skepticism and doubt in 2006, 2007 found participants confident that in most enterprises, open source solutions were already in place, or would be soon.



Participants were also much more realistic and pragmatic in 2007. In 2006, many participants believed that open source would take over the IT industry, if not the world in general. In 2007, the consensus was that open source and closed source technologies must and will coexist for the foreseeable future.

At the same time, participants made it clear that there were significant challenges and outright threats to enterprise open source solutions and their vendors. CIOs and CTOs at the event cited five specific requirements for all candidate open source solutions.

- Each must address a specific business need and/or solve a specific business problem;
- Each must meet all enterprise technological requirements (such as architectural compatibility, functionality, and reliability).
- Each must offer TCO characteristics that are demonstrably at least competitive with those of comparable proprietary or closed source solutions.
- Each must be offered by a vendor and/or vendor partner that also offers commercial, "enterprise-class" support.
- Each must demonstrate evidence of long-term market viability, such as community, developer, and/or industry support.

RFG believes these criteria apply equally to all candidate enterprise IT solutions, whether open source or not. Given the technological heterogeneity of every enterprise IT environment, holding all candidate solutions to a common set of evaluation criteria is essential. Further, these criteria can be boiled down into one overriding criterion. Every candidate offering must be more than a set of technologies – it must be a complete, integrated *solution to a business problem*.

This challenge, and its importance to enterprise IT and business decision-makers, is driven by multiple factors. These include continuing pressure on IT to do more with less, and increasing pressure on senior IT and business executives to manage compliance, governance, and risk consistently, effectively, and proactively. These drivers, combined with increasing business desires or requirements to do more business more effectively online, make economical, effective IT-empowered business solutions critical to the success of every type and size of enterprise. Meanwhile, detractors of open source continue to generate "FUD," or "fear, uncertainty, and doubt," by focusing on the challenges and minimizing the strengths and potential business benefits.

Against this backdrop, open source technologies and supporters themselves have evolved, and continue to do so. Whereas most IT decision-makers began paying attention to open source when Linux began gaining ground in the enterprise market, today, there are open source alternatives available in almost every major enterprise IT market segment. Moreover, a growing number and percentage of open source developers and supporters come from and/or are focused on the enterprise, and most established enterprise IT vendors offer at least some support for open source.

Support of open source by established vendors, including purveyors of traditionally licensed software, is growing, another critical development in the evolution of both the open source and proprietary/closed source markets. This is because the ability of so-called "pure" open source vendors to deliver sustained levels of enterprise-class service and support, or even basic profitability, is still very much an open question. In fact, it was cited as a chief concern among participants in the aforementioned event.

Meanwhile, traditional enterprise IT solution vendors are increasingly adopting open source development methodologies, solutions, and technologies, in a variety of ways. Thus, many open source and proprietary/closed source solution vendors are being "cross-pollinated" with processes, solutions, and/or tools from "the other side." Given this simultaneous, sometimes roiling evolution, as is true with all vendors,



especially emerging smaller and/or younger companies, IT decision-makers must combine aggressive vetting with strong contractual protections. This approach will help to prevent any vendor instability from becoming operational disruptions at their enterprises.

The confluence of events and developments outlined above creates both a challenge and an opportunity to enterprise IT decision-makers and their business-focused colleagues and executives. These decision-makers are increasingly challenged to do more with less, which increasingly requires assessing and/or explaining why open source does or does not make sense at their enterprises. The concomitant opportunity is to leverage open source solutions and elements of the open source ecosystem to achieve immediate and sustained business benefits, including but extending far beyond cost containment and avoidance.

Best Practices: Looking Beyond the Bits and Bytes

Given all of this, IT decision-makers must ensure that their evaluations of open source solutions and vendors take into account the unique challenges and strengths of open source. However, IT executives must also ensure that those evaluations are even-handed with respect to comparisons with traditionally licensed alternatives, and focused on enterprise requirements, not technological minutiae.

In this context, IT executives and their teams should base all open source evaluations and assessments on characteristics beyond open source technologies themselves. RFG believes that specific technologies take a back seat to two other elements that define and empower the open source ecosystem – *open communities* and *open standards*.

Open communities of like-minded individuals are, quite literally, the heart of the open source ecosystem. These are the developers, supporters, and users who drive creation, refinement, and updating of all leading open source solutions. They also lead the deployments, experimentation and testing, and online discussions that can lead to "battle-hardened," enterprise-ready solutions and updates, often more quickly and responsively than possible for any purveyor of traditionally developed and licensed software. However, the individuals and companies that participate in open communities do not always see things the same way and, in many cases, compromise is required.

In addition, these communities often form the foundation of much first-line support of those solutions. This is a particularly important consideration for enterprise IT decision-makers seeking to promote open source solutions within their organizations. Those decision-makers should give first consideration to candidate solutions supported by robust open communities. Where possible, those decision-makers and/or their staff should spend time exploring those communities directly before or during any serious candidate solution assessments. They should also assess vendor participation in open communities, and consider selecting a vendor who is a direct and active participant in the community.

There can be much variance in definitions of and commitments to open communities. Some vendors claim to support open communities, but do so in ways that limit broad participation and ensure control is maintained by a single vendor. Truly open communities, such as **The Apache Software Foundation**, **The Eclipse Foundation**, and Linux supporters worldwide, differ significantly from single vendor controlled communities. These are driven and supported by a broad ecosystem of corporate and individual contributors permitted to influence projects and developments based on the merits of their contributions.

It is important to realize that participation in open communities is a two-way street. That is to say, the leading participants in such communities not only make use of developments fostered by others, but make their own contributions to those developments. Wherever possible, enterprise IT executives and staff who extract



business value from participation in open communities should work with their colleagues to develop appropriate mechanisms for making some contribution to those communities. In many cases, contributions of information concerning best practices and proven policies for enterprise deployment and integration would be most welcome, and difficult if not impossible for participants focused on software development to provide. Such contributions could also help make a given solution more enterprise-ready.

Beyond open communities, open standards are also essential elements of the open source ecosystem. Such standards provide the "glue" that integrates open source components with one another, and enables their interoperability with incumbent and candidate enterprise IT solutions.

However, there can be much variance in definitions of and commitments to truly open standards. Some vendors claim to support such standards, but do so in ways that turn out not to be fully compatible or interoperable with other solutions accompanied by similar claims. In addition, open standards evolve, creating challenges for product developers and enterprise IT decision-makers alike seeking to support such standards consistently. However, this evolution also creates opportunities for enterprises to increase their influence over open standards, in concert with the independent software vendors (ISVs) currently leading investment in this area.

Enterprise IT decision-makers must plan and act proactively and consistently to take maximum advantage of open standards, while minimizing the risks of high costs and low performance caused by inadequate or inconsistent vendor support of such standards. Those decision-makers should focus their primary attention on vendors with proven, successful track records with open standards, and credibility within the communities supporting those standards. Documented histories of participation in reputable standards bodies should also be used as an important criterion when evaluating solution and vendor open standards support. In addition, where possible and appropriate, IT decision-makers and their staff should participate actively in bodies promulgating standards that are significant or strategic to the enterprise.

Based upon the experiences of hundreds of clients, RFG strongly recommends that IT and business decision-makers craft coherent, consistent, and integrated approaches to strategic decisions generally and open source decisions specifically. In some cases, a framework, such as the IT Infrastructure Library (ITIL) guidelines can provide a useful foundational model. Any such framework must include effective processes for assessing and refining all other processes and initiatives periodically and/or as changing circumstances warrant. Such an approach sets the stage for solution and vendor evaluations that are business-centric, clear-eyed, and level-headed. In addition, such a holistic, business-focused approach is more likely to provide more consistent and useful, "apples-to-apples" comparisons of candidate solutions and their vendors. This, in turn, enables evaluation of open source solutions and vendors and comparison with their alternatives in ways that avoid the "religious wars" that can stymie such efforts.

IBM: A Case Study and a Reflection

Among leading enterprise IT vendors, RFG believes **IBM Corp.** offers IT executives a useful case study of how the open source ecosystem has evolved and matured, and a largely effective response to and leverage of that evolution and maturation. IBM is adopting elements of the open source ecosystem in ways that benefit the company and its customers and partners. This hybridization, at IBM and elsewhere, indicates a more pragmatic and business-centric perspective that is steadily gaining traction, among enterprise IT decision-makers, and among vendors of both open source and proprietary solutions. The chart below highlights some of IBM's key efforts in support of open communities, standards, and technologies.



IBM's Support for Open Communities, Standards, and Technologies: Selected Examples

IBM and Open Communities	IBM and Open Standards	IBM and Open Technologies
<ul style="list-style-type: none"> • Apache – IBM has been a major participant in and supporter of numerous projects for years. IBM began adopting the Apache Web server in 1998, and is currently involved in projects including Geronimo, Harmony and Tuscany. • Blade.org – an ecosystem of vendors and supporters of blade servers, forged in 2005 with Intel Corp. after IBM made openly available its specifications of BladeCenter servers. More than 200 independent vendors have adopted technology developed through IBM's open-source blade initiatives, at least 50 of which were enabled by IBM's work with independent venture capital investment firms, according to the company. • Eclipse – IBM created Eclipse by contributing \$40 million in code and tools to open source in 2001. IBM continues to be a strong supporter and active participant through projects such as Aperi (for storage management), Higgins (for identity management), Rich Client Platform, and Web Tools Platform. • Globus Consortium – a group of leading IT vendors supporting common open source tools for building computing grids. • Linux – IBM has been involved in Linux since 1999, and has more than 300 programmers working on 	<ul style="list-style-type: none"> • Decades of active participation in standards bodies and working groups, from the Automotive Industry Action Group (AIAG) and ACORD (insurance industry standards) to the Organization for the Advancement of Structured Information Standards (OASIS) (where IBM is a Foundational Sponsor) and the World Wide Web Consortium (W3C). Web services and the Open Document Format (ODF) are recent examples of key standards initiatives driven within these standards bodies. • Stepping up support of open industry-specific technology architectures, such as the Eclipse Open Healthcare Framework. Maintaining or increasing investments in open source projects that influence or could evolve into open standards, such as those conducted by Apache and Eclipse. 	<ul style="list-style-type: none"> • Extensive catalog of Linux-based offerings on platforms ranging from client systems to mainframes and a wide range of fee-based support services. • Extensive support for Eclipse technologies. The Rational Software Delivery Platform is built on top of the Eclipse platform. Several IBM products leverage the Eclipse Rich Client Platform and IBM is a major contributor to the Eclipse Rich AJAX Platform (RAP) project. • Extensive support for numerous Apache technologies including the following. <ul style="list-style-type: none"> ○ Several IBM products leverage the Apache Web Server and the WAS CE product is built on Apache Geronimo (see below). ○ Some 60 IBM projects incorporate support for Apache's Derby Java database management systems. ○ IBM's recently announced Dynamic Warehousing initiative leverages the Apache Unstructured Information Management Architecture (UIMA) technology which provides an open and extensible platform for creating, integrating and deploying unstructured information management solutions. ○ IBM OmniFind Yahoo! Edition, a free enterprise search engine, is based on the



<p>Linux as part of the open source community.</p> <ul style="list-style-type: none"> • Mozilla – a foundation that delivers open source technologies including the Firefox Web browser. IBM is contributing code and skills, to improve Firefox accessibility, for example. • Power.org – a consortium of vendors supporting the Power Architecture technology platform for collaborative hardware innovation. 		<p>Apache Lucene search engine. (See below.)</p> <ul style="list-style-type: none"> • All IBM software products support Mozilla Firefox as a first- class browser alternative.
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Source: IBM and Robert Frances Group (RFG).

IBM and Open Communities

Regarding open communities, beyond the activities highlighted in the above chart, IBM is also participating extensively in open source licensing discussions across the entire industry, executives said – including those focused on GPL v3. Internally, the company tries to keep its own projects under only a handful of licenses, to minimize complexity and risk for enterprise customers. RFG recommends that enterprise IT decision-makers adopt a similar approach.

With regards to open source, IBM’s strategy is to participate in open communities that encourage broad and diverse support from corporations and individuals. Examples of such open communities are included in the table above. IBM avoids participating in open source communities controlled by a single vendor since it believes this hinders innovation and can lead to vendor lock-in.

IBM is also extending the community aspects of open source for its closed source offerings. The company's recently announced "Jazz" project is a clear example of this approach. Jazz is a joint project between IBM Rational and IBM Research to build a scalable, extensible team collaboration platform integrating work across the development life cycle. Although Jazz is not an open source project, it is built on top of Eclipse and is meant to complement and extend what Eclipse has already done, IBM executives told RFG. The first product based on Jazz technology will be Rational Team Concert, a portal designed to support collaborative development, now in beta release.

Aside from the technological strengths and benefits of Eclipse support, IBM's approach to Jazz and Rational Team Concert is markedly different from most previous commercial software development efforts, even at IBM. In the past, most such efforts were closed, "black-box" affairs, with user input leading to decisions by vendors about what desired features to deliver and how and when to deliver them.

In contrast, IBM is developing the Jazz technology and Rational Team Concert using what it calls "open commercial development." This essentially applies to commercial development the open, transparent, "release-early-and-often" style characteristic of open source development efforts. This process leads to wider community collaboration, backed up by IBM and its partners, proven providers of "enterprise-class" solutions and support. One IBM executive referred to this as "moving the firewall all the way back," to expose architectures, source code, and underlying elements and structures, to invite and encourage input and feedback.



This approach is implemented at www.jazz.net, the Jazz community site, a portal open to IBM Rational customers, employees, and partners. This site is a focal point for what is basically an open commercial development community. The Team Concert beta is a tangible product of that community, with which members and others can start working today. In addition, there are four other "incubator" projects featured at the Jazz.net portal. These are focused on code analysis, reporting, process authoring (which includes capture, discovery, exposure, and prioritization), and "story authoring" for more effective software requirements capture and definition, according to IBM.

IBM DB2 Express-C is another example of how IBM leverages open communities in support of closed source offerings. DB2 Express-C, a fully functional database offering, is not an open source project, but it can be freely downloaded and deployed. In addition, IBM provides complete documentation for the product and offers free Web support, including an online forum and e-mail list. (More robust support options are available for a fee.).

RFG believes IT executives should pay particular attention to the relationship current and candidate vendors have with key communities, open source and otherwise. Particularly among open source developers, corporate credibility is under constant scrutiny, and vendor contributions to open source communities are an important measure of that credibility. IT executives should periodically quiz vendors about their contributions to key open source and other industry communities – and subject their own enterprises to equivalent scrutiny.

IBM and Open Standards

Regarding open standards, perhaps no other vendor has the breadth and depth of experience in supporting and leveraging these than IBM. This is critical to the company's ability to provide successful integration and interoperability of open source and proprietary/closed source solutions, internally and for its enterprise customers. IBM's overall strategy is to cooperate on open standards and compete on implementation, according to company executives.

In the late 1990s, IBM's open standards efforts focused heavily on Java and XML. During that period, IBM founded XML.org and helped author and lead several XML standards. IBM's more recent focus is establishing Web Services and SOA standards within the Distributed Management Task Force, Inc. (DMTF), OASIS, and W3C. It has co-authored and co-chaired numerous submissions and working groups, and is currently doing so, in the area of Web Services interoperability, management, and reliability. IBM has also helped to establish the Open SOA community (www.osoa.org). This effort is focused on defining a language-neutral programming model for SOAs, including the Service Component Architecture (SCA) and Service Data Objects (SDO) specifications.

Another critical standards initiative for IBM is the Open Document Format (ODF) which defines a standard file format for electronic office documents. IBM was a key participant in the technical committee at OASIS that defined the standard. IBM also helped advance ODF as a formal International Standard published by the **International Organization for Standardization (ISO)** and the **International Electrotechnical Commission (IEC)**. IBM views ODF as being one of a number of so-called "Web 2.0" technologies that have the potential to unleash extraordinary innovation.

IT decision-makers should realize that open standards and open source technologies often drive one another, and ensure that their strategies for open source adoption and integration focus equally on both. In some cases, solutions are more immediately important than evolving standards. In others, support of open standards is essential for effective integration and interoperability.

*IBM and Open Source Technologies*

Regarding open source technologies, IBM has supported these for years, within and in concert with its products and in terms of direct participation. Today, IBM is making the business case for open source across its entire software portfolio. Specifically, IBM is embedding, layering, and/or extending open source technologies within its offerings where those technologies make the most business sense and deliver the most benefit to users of those offerings. Details of three examples – Lotus Notes 8, OmniFind Yahoo! Edition, and WAS-CE – offer useful insights into IBM's approach and its implications for IT decision-makers.

Lotus Notes 8 represents the leveraging of key open source technologies within a core, well-established IBM product offering. The enterprise collaboration and communications solution is now built atop the Eclipse RCP. This solves the problem of building rich, cross-platform, native-looking applications, according to IBM executives interviewed by RFG.

From a business-building perspective, the new platform is also making ISVs far more interested in Notes, since its new architecture results in lower opportunity cost for developers pursuing Linux, **Apple, Inc.** Mac, and/or Windows customers. IBM is also focusing on building and enabling others to build applications and extensions for Notes 8 using Eclipse and open source technologies. RFG believes the prospect of making the changes necessary to support Microsoft Windows Vista and/or the forthcoming "Longhorn" server environment will motivate many ISVs to look at and for effective alternatives to Microsoft's developer tools.

IBM OmniFind Yahoo! Edition combines IBM's leverage of open source technologies with its support of open communities. The offering provides entry-level enterprise search software, based largely on the Apache Lucene search engine project, as well as other technologies that power IBM's commercial OmniFind offerings. OmniFind Yahoo! Edition is freely available to enterprise and commercial developers. It has been downloaded by some 21,000 companies, according to published reports. The software has also attracted a community of development partners building solutions based upon it and add-ons to enhance its business value.

Beyond OmniFind Yahoo! Edition, IBM also makes the core Java framework of its Unstructured Information Management Architecture (UIMA) available as open source software, and offers a free UIMA software development kit (SDK) as well. UIMA is a critical component of IBM's recently announced Dynamic Warehousing initiative. IBM enterprise customers are currently using UIMA to import unstructured data into warehouses, then analyze it for opportunities to "cross-sell" and "up-sell," IBM said. The company is also pursuing similar opportunities itself, focusing on providing support for analytics, business intelligence (BI), data quality, and reporting.

"Open source is very, very strategic to the information management strategy at IBM," said Andrew Warzecha, VP of strategy for IBM's Information Management division. Open source information management solutions help IBM to capture developers, and to drive users to its core commercial hardware, service, and software offerings, he added.

IBM WebSphere Application Server Community Edition (WAS CE) represents another effort at IBM to leverage and combine the strengths of open source and closed source technologies with enterprise-class support and service. WAS CE is effectively an open source solution with very few closed source components added for ease of use and quality of service, according to IBM. This is in contrast to Lotus Notes 8, which is primarily a closed source product that takes advantage of the Eclipse RCP.

WAS CE is based on the Apache Geronimo application server project. Many components of Geronimo, such as Tomcat, come from multiple sources, and have lives of their own. This can make adoption of such open source solutions challenging. WAS CE was designed to address this, by building upon a streamlined



configuration of Geronimo with fewer options, to create a customizable, free, lightweight application server. Developers can therefore spend time developing, not assembling and integrating multiple options. With WAS-CE, open source technologies not only reduce up-front costs by enabling demonstrable business value before requiring significant investment, but help to reduce "time to success" with desired applications.

This combination of the strengths of open source and IBM, also help to push skeptical businesspeople "off the fence" regarding "pure" open source such as Tomcat, according to IBM. Developers get the innovative tools and features they prefer, while enterprise IT decision-makers get IBM's rigorous processes for integration, IP protection, and testing, as well as optional fee-based support.

Conclusion

IT executives considering or pursuing open source initiatives should keep in mind that there is a lot of innovation going on among developers of "private source" and truly proprietary solutions. Those executives should choose to work closely with vendors that understand the business need and advantages of an approach that strives to integrate and balance innovation from all sources.

RFG believes IBM has demonstrated one of the most comprehensive, integrated, and pragmatic approaches to open source ecosystem support. The company has both an understanding of and commitment to open communities and open standards, as well as to open source technologies that integrate well with other alternatives in ways that enable business value for developers and enterprise customers. "Open source is important and fundamental for us. Our goal is to build advantages from open source into IBM's core businesses, rather than to build something interesting on the side," Jeff Smith, VP, Open Source and Linux Middleware at IBM.

IT executives should seek as strategic partners vendors that strive to demonstrate similar levels of understanding and commitment, regardless of their size or age. IT executives should also strive to enable their own enterprises to take maximum advantage of all relevant elements of the open source ecosystem, using relevant activities at key incumbent and candidate vendors as examples wherever appropriate.

RFG believes IT executives will be most successful in translating open source solutions into business benefit by taking a comprehensive, holistic view of those solutions in the context of their surrounding ecosystem. IT executives must also choose as strategic vendor partners companies that can demonstrate understanding of the strategic imperatives and implications surrounding open source in the enterprise, and success in addressing these. Among leading IT vendors, the efforts and approaches taken by IBM represent both useful examples and models, and significant potential business benefit. IT executives should investigate IBM's offerings and efforts closely, and compare them carefully to those of competitors, to identify opportunities for their enterprises to succeed with open source.

RFG analyst Michael Dortch wrote this Research Note for IBM. Interested parties should contact RFG Client Services to arrange further discussion or an interview with Mr. Dortch.