

VIEWPOINT

OSSmosis –The Infosys Open Source Journey



OSSmosis
Exchange. Innovate.

Infosys®

Background

The world around us is being transformed in fundamental ways with software and communication technologies. As bits reshape and pervade the atoms around us, connecting us and the world around us, most businesses find themselves in a struggle to survive, to transform themselves, and to be relevant in the times to come.

Infosys believes that open source software, and its corresponding ecosystem, will be a necessary enabler as enterprises use the Internet to build a new class of consumer-centric, real-time and connected applications. This paper presents the case for open source usage in the enterprise, and then outlines OSSmosis, the Infosys open source journey.



Overview

There are three significant trends that are reshaping every industry today, and each of them, by itself, has the potential to disrupt existing ways of making technology and business choices. Enterprises need to invest in all of these to continue to stay ahead of existing competition, as well as likely new entrants.

1 New Platform Dynamics: In addition to cloud, the exponential increase of computing power with capabilities like in-memory computing, has given every business and IT department the power to cost-effectively automate significant pieces of their operations, and build web-scale applications. In the past, the cost of this infrastructure, and the complexity of developing the necessary software, prevented most organizations from making these investments. This is now changing with the availability of elastically scalable commodity hardware, and automated and self-healing software. In addition to scale, these infrastructures are based on open standards, are supported by multiple vendors, and provide business and IT the necessary agility to cost-effectively experiment with new applications.

2 Data and Algorithms: Businesses always had access to data, but not much was being done to derive the necessary insights from this data. In addition to not having access to skilled talent (e.g. data

scientists) to derive meaning out of this data, the cost of storing and processing all the data to derive the necessary meaning and correlations was prohibitive. However, as outlined above, this is now rapidly changing, and companies that don't make the necessary investments in platform, talent and the necessary data-driven culture are likely to be at a disadvantage over time.

3 Smart, Connected Products: The advent of smart, connected products, and the adoption of 3D printing is likely to redefine the entire product value chain – from design, manufacturing, delivery and sales, to servicing, and finally feedback from customers. It is conceivable that large parts of this value chain will be completely digitized, with a final personalized product being delivered directly to the end user.

The above trends require IT to create a portfolio of new applications (systems of engagement) that provide excellent user experience, can rapidly evolve as the needs of the business evolve, and can scale to support hundreds and millions of end users. In addition, these new applications need to co-exist, and in several cases, extend the capabilities provided by existing enterprise applications such as SAP and Oracle (systems of record).

Open source software, with projects such

as Linux, MySQL, OpenStack, Apache, JBoss, Hadoop, Cloud Foundry, etc., is becoming the de-facto standard to build these new web-scale applications. While open source has always played a key role in companies that primarily emerged in the Internet era (such as Google, Facebook, Amazon, Netflix, Airbnb, etc.), it is now becoming a dominant choice in most industries to build these new consumer-centric, data-driven, and connected applications. Being lower cost, standards-based, and vendor-neutral were the primary drivers for open source adoption in the initial stages. However, speed of innovation and higher quality are the primary drivers for increased adoption in enterprises today. While there are still gaps in areas like development tools, ease of management, and performance, these are quickly being addressed with commercial vendors (including Infosys) actively participating in the open source ecosystem by contributing code, optimizing performance for specific hardware and workload characteristics, and by providing dedicated commercial support for these projects.

The following sections provide details on why the open source ecosystem has matured in the enterprise, and how Infosys has adopted open source as a key enabler of its service offerings.

The Maturing of Open Source in the Enterprise

Several Infosys customers are evaluating open source alternatives in areas such as DevOps, NoSQL databases, big data, and mobile, and are asking Infosys to consider these as a part of our technology recommendations as well. The reasons for this increased interest is the rapid maturation of open source technologies as outlined below:

- **Rapid Innovation:** Areas such as cloud, big data, DevOps, etc. are seeing a much faster cycle of churn on the technology choices, and open source is providing most of the capabilities much sooner than commercial vendors.
- **Better Quality:** Quality of the popular open source components is already comparable, and possibly even better, than equivalent commercial software, and rapidly getting better.
- **Improved Security:** Security is now a much smaller concern with open source. With the amount of scrutiny popular projects get, any new issues get highlighted quickly, and more importantly, are fixed much faster, and in a transparent manner.
- **Commercial Support:** A large number of companies and developers are involved in the creation and enhancement of the popular open source components. While community support was always available, this support is now growing with several organizations (including Infosys) providing commercial support.

“...by 2016, Open Source Software will be included in mission-critical software portfolios within 99 percent of global 2000 enterprises...”
 Gartner
 “78% of the companies run on Open Source... (double since 2010)”
 “66% consider Open Source first...”
 Blackduck, North Bridge Future of Open Source survey 2015

Open Source Adoption at Infosys

Given this demand to support open source, Infosys has taken a strategic decision to build deep open source expertise across the entire organization. The Infosys Open Source program – OS-Smosis -- was set up with an objective of “Nurturing Innovation through Open Source Adoption & Contribution.” These objectives are being managed using the following five tracks.



- **Capability Building:** The Infosys world-class training infrastructure has been enabled to deliver courses on open source projects. 100+ training programs on open source are now available with 2000+ employees taking these courses every month. In addition, knowledge sessions are regularly arranged for our teams from research and industry thought leaders.
- **Communities of Practices:** To build a culture of awareness, adoption and contribution among our employees, Infosys created Communities of Practices (CoPs) that allow continuous interactions and learnings among our employees on open source projects, in addition to interacting with external communities. Currently 12 such CoPs exist, with point of views on four key areas – DevOps, Responsive Web Design, Big Data, and NoSQL.
- **Process and Infrastructure:** Usage and experimentation with open source requires the ability to download the necessary software, and the ability to run it on modern, scalable infrastructures. Infosys has significantly revised its IPR policies and processes in these areas,

including hosting local repositories of popular open source projects, providing cloud-hosted virtual machines for experimentation, and formalizing the Infosys open source contribution guidelines and approval processes.

- **Partner Alliances:** In addition to Infosys directly supporting many open source projects for enterprise customers, we are also strengthening existing partnerships and alliances with several key open source technology vendors. These are being leveraged for joint solutions and joint wins.

- **Branding:** To nurture wider adoption and contributions, Infosys regularly conducts OSSmosis events across all Infosys development centers. These events provide a showcase of our internal capabilities, and the employees also get to interact with other internal open source practitioners, external open source contributors, industry leaders, and academia. Infosys also sponsors external forums such as the Open Data Platform, and hosts open source workshops and user meets across Infosys campuses.

Since the launch of OSSmosis, Infosys has seen a significant adoption of open-source,

the highlights being:

- **25,000** Infosys developers have attended courses in open source technologies in the past 3 quarters.
- **30+** contributions have been completed or are in progress within Infosys in projects such as Jenkins, OrientDB, Selenium, and Hadoop.
- **10+** active partnerships for joint solutions with open source vendors.
- **500+** VMs in active use on an ongoing basis for POCs on open source across the organization.

Client Case Studies

Customer Loyalty Program for 19 Million Users	Scalable Procure to Pay Platform
Context: One of the world's largest loyalty programs needed to quickly onboard partners and their customers	Context: Infosys ProcureEdge is a P2P (Procure to Pay) platform. Needed to be scalable with multi-tenant support
Business Drivers: Globally loyalty schemes are highly competitive, bringing compelling consumer experience with agility is a key differentiator	Business Drivers: In a P2P platform, product catalogue is a critical element. The catalogue needs to handle product images with flexible product attributes
Infosys Solution: One-Click Continuous Delivery through DevOps – On demand dynamic environment provisioning. Seamless switch between public and private clouds	Infosys Solution: Horizontal scalability using clusters and sharding the database. Flexible schema support using document oriented database.
Results: Accelerated time to market through DevOps and continuous delivery	Results: Scalable high performing cost effective e-procurement solution
Tools and Technologies: - Jenkins, Puppet, Ruby, Nagios, Logstash, Git, Selenium, Sonar, Zookeeper	Tools and Technologies: - NoSQL document database - MongoDB GridFS, Redhat Linux, Apache httpd with mod_gridfs, Load Balancing using MongoDB replicas
Digital India - e-Governance Portal for States	Responsive Analytics Dashboard
Context: e-Governance aimed at simplifying processes, bringing in transparency, quality and timely information to all the citizens of the State	Context: A banking client wanted to build an analytics dashboard that should be available through any channel, including desktop, tablets or smartphone
Business Drivers: Easy onboarding of various state departments, strong governance and control mechanism, data standardization	Business Drivers: User Experience is consistent and seamless across channels
Infosys Solution: Selecting the right technology and infrastructure. Addressing the scalability, performance and security needs.	Infosys Solution: A rich internet application solution is developed leveraging the Responsive Web Design (RWD) framework
Results: 4 Indian states – anytime, anywhere service access to citizens. 42+ services across 10+ departments	Results: A rich and responsive solution - modular and reusable across lines of business
Tools and Technologies: - Redhat Linux, JBoss SOA, PostgreSQL, Alfresco, Orbeon	Tools and Technologies: - HTML5, CSS3, Modernizr, jQuery, jQuery plugins, Bootstrap, Backbone, Underscore, REST Web Services, Spring MVC

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