

Busting Myths of SaaS and PaaS: The Enterprise Meets the Cloud (June 2008)

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Contents

Myth: Full-scale enterprise application developers should take a pass on PaaS 1

Busted: Both internal and external applications are better built on a Platform as a Service

Why salesforce.com bets on SaaS and PaaS

The future of software is the end of software

What Does the Enterprise Want? 2

What's measurable is (only part of) what matters

The care and feeding of data

Not Merely Capable, but Compelling 3

Capacity and reliability

Governability and interoperability

Enabling a focus on innovation

“Innovative” Need Not Mean “Unfamiliar” 4

On beyond code

Myth:**Full-scale enterprise application developers should take a pass on PaaS**

Software as a Service (SaaS) got its start as an ideal option for a small or medium business lacking in-depth, in-house IT resources. First-generation SaaS offerings were therefore optimized for simplicity – and even today, it’s still common to find SaaS products and portfolios that lack the scalability, customizability and protection of intellectual property that enterprises demand from a strategic platform.

Moderate extensibility is not enough to transform these shallow foundations into credible alternatives to established enterprise platforms. **No one should fall into the trap, though, of thinking that these simplest SaaS applications represent the limits of what SaaS can do – or what a Platform as a Service (PaaS) can enable.**

Unfortunately, the first example of SaaS that an enterprise buyer may see is likely to be a consumer-grade offering. Many such services, typically fee-free and supported by advertising revenues, provide only limited function with shallow customization. The resulting impression of SaaS solutions as “applications lite” can pave the way for a self-serving sales pitch by a provider of on-premise technology.

It’s very much in the interest of legacy technology providers to misrepresent origin as destiny: to tell an enterprise buyer that any SaaS offering is inherently an entry-level approach, and that successful enterprise adoption will always lead to a need for migration to on-premise implementation. This willfully minimizes the substantial capital investments, the higher operation and support costs, and the technical risks and delays that result from owning an IT infrastructure – while suggesting that there is no real alternative to on-premise IT for strategic systems.

What’s true for some, however, is by no means an identity for all: the design decisions and the target-market choices of consumer-facing SaaS providers should not be mistaken for evidence of intrinsic limits. **A lightweight SaaS portfolio is an outcome of a business model choice, not a consequence of technical constraints.**

Enterprise-grade SaaS is not merely possible, but is a present-day reality, and is not even limited to a tiny handful of existence proofs. There is already a broad and varied ecosystem of service providers that offer the enterprise system builder a capable toolkit for addressing critical needs and pursuing compelling opportunities.

Busted:**Both internal and external applications are better built on a Platform as a Service**

The technologies of true SaaS, specifically metadata-based customization and multi-tenant architecture, have evolved to the point that they demonstrably handle the workloads of many of the world’s largest companies.

- When Starbucks or Dell want to engage their customers in transforming their products and services, they build customized portals for discussion using Salesforce Ideas – and deploy worldwide in weeks.
- When Dolby Laboratories wants to offer technology management for every screen in any theater, it works with integration professionals like those at Appirio Inc. to blend services from salesforce.com and Google into a custom solution – with no new IT infrastructure at Dolby or in the theaters.

Meanwhile, enterprise information handling requirements and operating environments have evolved to make the strengths of the service model increasingly relevant to organizations of all sizes.

- Information must be secured to rising standards, against the risk of ever more stringent penalties for any lapse of data governance, in an environment of complex and rapidly emerging threats. A service provider can spread the costs of maintaining robust security across tens of thousands of customers.
- The cost and complexity of new data centers are both rising rapidly. Gartner projects that new data centers will consume 600 watts per square foot by 2011, a five-fold increase compared to current facilities. Service providers can optimize site selection and achieve superior economies of scale.

Why salesforce.com bets on SaaS and PaaS

The concepts and values of delivering Software as a Service, and of offering developers an open-ended Platform as a Service, originated in the needs of the small IT operation – but this does not mean that SaaS and PaaS remain restricted to that domain. SMBs’ need for function without complexity, and demand for first-class service at a coach-class price, have shaped SaaS and PaaS into what’s now become the better choice for the enterprise as well.

The future of software is the end of software. Read on for more.

What Does the Enterprise Want?

Products have competitors, but platforms have partners. Every IT vendor, therefore, would like to position what it sells as a platform – suggesting that it offers, not merely a solution to a single problem, but rather a strategy that paves the way for solutions to all problems. Buyers must filter the resulting cacophony of claims against a short but stringent list of criteria that make for enterprise-readiness at the foundations of an IT portfolio.

Enterprise-grade capability is not measured merely with benchmarks, although there are quantifiable elements that should be on a buyers' shopping list. Gross capacity for large collections of data, scalable performance that preserves usability as workload grows, and cost-effectiveness – both minimizing initial risk and maintaining affordability over the long term – are all subject to measurement and comparison if the proper questions are asked.

Visionary CIOs, CTOs and CEOs will also go beyond these concrete (albeit often complex) measures to consider the role of IT platform provider as technology partner and strategy enabler. In June 2008, for example, food service retailer McDonald's Corp. [gave its first "technology supplier of the year" award](#)¹ to one of its key suppliers of point-of-sale devices and systems: the list of award criteria began with pricing, but continued with considerations of vendor innovation (not just in products, but also in problem-solving practices) and the vendor's role as a collaborator in identifying relevant trends and the resulting competitive pressures and opportunities. Enterprise application platform selection should take the same kind of broad and far-sighted view.

What's measurable is (only part of) what matters

A crucial difference between enterprise technology and "personal," desktop or small-business technology is the capacity to handle high volumes of data and transactions – not merely to bear a heavy load, but to manage scarce resources in ways that are aligned with business needs and responsive to evolving requirements.

The huge success of the personal computing revolution of the '80s, and the still-greater spread of PC technologies propelled by graphical interface adoption in the '90s, has left in its wake a massive legacy of investment in business systems that can't readily grow or adapt. In May 2008, a post in an on-line marketing professionals' forum lamented² the difficulties of moving a company beyond its "15-year-old dBase application that had no space for things like contact email addresses, no ability to search on products licensed, etc." Many such companies are in need of IT improvement but are limited by skills, budgets, and the tyranny of "good enough."

Delaying new development may be dangerous. Even companies that are not on the scale of a global enterprise are still under pressure to interoperate with the rapidly advancing systems of the global operations that are often a smaller company's most vital customers. In January 2008, for example, [Information Week reported](#)³ that "Wal-Mart has apparently tired of its investments in radio frequency identification turning into a prolonged pilot study and is stepping up pressure on suppliers to comply with its 3-year-old inventory-technology mandate. The retailer says that beginning Jan. 30, it will charge suppliers a \$2 fee for each pallet they ship to its Sam's Club distribution center in Texas that doesn't have an RFID tag."

In end-to-end data integration and in many other respects, business now takes place at the speed of bits, with real-time interactions across heterogeneous and broadly distributed systems becoming increasingly the norm – and with both the scale and the complexity of the business data environment on trajectories of dramatic growth. In March 2008, [the IDC subsidiary of International Data Group projected](#)⁴ that "by 2011, the digital universe will be 10 times the size it was in 2006" – moreover, that "because of the growth of VoIP, sensors, and RFID, the number of electronic information 'containers' — files, images, packets, tag contents — is growing 50% faster than the number of gigabytes. The information created in 2011 will be contained in more than 20 quadrillion — 20 million billion — of such containers, a tremendous management challenge for both businesses and consumers."⁵

The care and feeding of data

A further concern is that the enterprise itself, and even its supply-chain partners, are not the only stakeholders or the only parties in a position to set the bar higher for information-handling standards and practices. Of note for enterprise system managers is IDC's warning that "Approximately 70% of the digital universe is created by individuals, but enterprises are responsible for the security, privacy, reliability, and compliance of 85%."

Managers are therefore advised by IDC to embark on a three-step plan to "tame the digital universe":

1. Engage business units in managing data creation, storage, security, retention and disposal
2. Exercise policy leadership in information security, information retention, data access, and compliance
3. Accelerate adoption of new tools for storage optimization, analytics and unstructured search

¹ 3 June 2008, "How to evaluate vendor performance," Kim S. Nash, computerworld.com

² 26 May 2008, "Experiences With Sales Automation Applications?" marketingprofs.com

³ 19 January 2008, "Wal-Mart Gets Tough On RFID," Mary Hayes Weier, informationweek.com

⁴ 11 March 2008, "New Study Forecasts Explosive Growth Of The Digital Universe," IDC

⁵ <http://www.emc.com/collateral/analyst-reports/diverse-exploding-digital-universe.pdf>

Beyond technology

- :: Enterprise technology providers must have more to offer than their own products and services
- :: Visionary managers in customer organizations are looking for strategic technology partners to highlight industry trends and aid in pursuing opportunities
- :: Small and medium businesses must be ready to interoperate with the information systems of the global enterprises that are their most important customers
- :: The expanding "digital universe" challenges companies of all sizes to keep up with rapid growth of both the volume and the variety of data objects and their associated handling needs

Not Merely Capable, but Compelling

Enterprises are thus facing challenges on many fronts for innovation in processes and partnerships, growth in data volume and variety, and improvement in data handling and protection. Corresponding strengths of capacity and reliability are enhanced by superior governability and standards-based interoperability in the cloud computing model (and the Force.com platform in particular): these alone are enough to make the Platform as a Service a credible option. More than that, however, the economics of lower initial investment, more rapid time to value, and dramatically greater freedom to experiment and innovate are benefits that make the cloud compelling.

Capacity and reliability

During the fiscal year that ended on January 31, 2008, salesforce.com delivered 29 billion transactions at 99.9 per cent uptime.⁶ At the beginning of June 2008, weekday transaction volumes routinely exceeded 150 million with typical completion times well below 0.3 second. Service to rapidly growing markets outside the U.S. is planned to be addressed in the current year by a new data center and a new network operations center that will both be located in Singapore.

Governability and interoperability

Salesforce.com operations receive routine scrutiny from demanding customers – whose input, due to the inherent strengths of multi-tenant architecture, is reflected across the entire platform with benefits to all customers.

Additional scrutiny by trusted third-party auditors yields further, formal assurance to customers in the form of

- SAS 70 Type II certification (www.sas70.com)
- Systrust audit (www.aicpa.org/trustservices)
- ISO 27001 certification (www.27000.org/iso-27001.htm)

Interoperability between salesforce.com systems and other IT assets and services is assured by a broad spectrum of integration partners (www.salesforce.com/platform/integration/) as well as an extensive portfolio of salesforce.com's own tools. Integration pathways supported by multiple technologies and by a growing family of professional services providers include

- Native connectors to Oracle and SAP ERP systems
- Integration middleware offerings from more than 25 providers
- Developer toolkits for code-enabled integration using a wide range of mainstream languages and frameworks including Java and .Net
- Click-to-integrate mashup offerings available on the salesforce.com AppExchange
- Native connectors to desktop data stores including Microsoft Office documents and Lotus Notes

Additionally, developers using the extensive platform facilities of Force.com enjoy rapid access to Web services integration opportunities. A developer can expose logic in Apex Code, the first in-the-cloud language of multi-tenant development, so that external applications can access that logic and its associated applications by defining a class from a WSDL document; developers can also write Apex Code expressions that consume external Web services using either SOAP and WSDL, or the http services that are also called RESTful services.

Enabling a focus on innovation

Consumer-driven demands, rather than traditional business technology adoption cycles, have become the forcing function of IT trends. So observed Rishi Chandra, product manager for Google Enterprise, in remarks at the Enterprise 2.0 conference in Boston during June 2008: "Important breakthroughs in usability, reliability and security are occurring first in the consumer market – and consumers have already decided that the cloud is where they want their software," [wrote one observer](#) summarizing Chandra's remarks.⁷

Rapid adoption of SaaS suites such as Google Apps (by large organizations⁸ as well as by individuals), and moves by established thick-client developers such as Adobe into on-line delivery⁹ of application function, signal the disappearance of past cloud-computing barriers of convenience or capability – and cloud-based applications have also become the mechanism of choice for engaging demanding customers. When Dell Computer launched its IdeaStorm site in February 2007, based on the SaaS application that is offered by salesforce.com under the name of Salesforce Ideas, it took only two days to generate 25,000 requests for Dell computers with pre-installed Linux operating systems – producing a rapid response, with new Dell configurations coming to market that May.

⁶ 27 February 2008, "Salesforce.com Inc. Q4 2008 Earnings Call Transcript," seekingalpha.com

⁷ 10 June 2008, "The Four Trends Driving Enterprise Cloud Computing," Paul McDougall, informationweek.com

⁸ 20 November 2007, "Capgemini Leverages Google Apps to Cut Call Center Costs," Erika Morphy, crmbuyer.com

⁹ 5 June 2008, "Adobe Erects Photoshop on the Cloud," Maureen O'Gara, websphere.sys-con.com

Due diligence in data handling demands rising levels of expert assistance

- :: System performance management is becoming a global task
- :: Formal certification of information security technology and practice is becoming a rising and necessary cost of doing business
- :: Interoperability issues extend both up and down the supply chain, and also across the enterprise whose IT portfolio has grown through mergers and acquisitions
- :: Service providers can handle these costs at larger scale, and therefore much lower cost per network node or end-user device, than on-premise technology

Breakthroughs can be hidden behind the curtain

- :: Enterprise developer skill sets can remain highly applicable to service-based application design and delivery
- :: Language design, tool choice and collaborative development aids can make cloud-based development far superior to current practice in most IT shops
- :: Assembly of diverse services such as bulk computing, storage, and enterprise API sets will continue to call for advanced developer skills – but not the same skills that have previously been most important

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“Innovative” Need Not Mean “Unfamiliar”

The breakthrough strengths of Force.com might be suspected to come at a price of substantial re-training of IT staff, and of application developers in particular. This might be the expectation of those who’ve lived through “development revolutions” of the past, such as logic programming and knowledge engineering, which never overcame their disadvantage of being far from the center of developers’ skill sets.

Development teams and their managers may therefore be pleasantly surprised to discover that the conceptual foundations, and even the programming syntax, of Force.com platform development (and Force.com-based extensions to salesforce.com and partners’ applications) are readily grasped by most developers who have current mainstream programming experience.

Blogger Daniel Pietraru has produced a [well-researched analysis of programming language success](#)¹⁰ that concludes, if one may summarize, that languages succeed when they combine familiar syntax, really good tools, and the prospect of enabling “earth shattering improvement in the life of...programmers and projects.” These are precisely the attributes most closely associated with Force.com’s Apex Code facility.

When viewed from Pietraru’s proposed perspective, Apex Code can be readily recognized as a Java-family language, supported by an Eclipse-based tool ecosystem, with excellent facilities for unleashing immense gains in developer productivity and enterprise project success.

- Familiar syntax: it’s no small thing to be [a member of the C/C++/C#/Java family, syntax-wise](#). Pietraru estimates, from various independent metrics, that this family of languages accounts for roughly half of all programmer mindshare, while fascinating and powerful tools like Python, Ruby, [Lisp/Scheme](#) and [Smalltalk](#) have a combined share of less than 8 per cent. If someone claims to be a programmer, the odds of his or her being able to read Apex Code pretty much on sight – and understand pretty well what the code is doing – are considerably better than even.
- Good developer tools: it’s likewise no small thing for a language and platform to be well served by Eclipse. [Research released in June 2008 by Evans Data](#) found an [Eclipse-based development environment rising above respected and well-supported alternatives](#) such as Microsoft’s Visual Studio and Sun Microsystems’ NetBeans. The [Eclipse-based Force.com IDE](#) is therefore an attractive way to enter the cloud.
- Programming and project improvements: Apex Code does demonstrably pave the way to “earth shattering improvement” (in Pietraru’s phrase). [Developers at CODA plc](#) have discussed in public their better, faster and cheaper project delivery using Force.com.

Moreover, [ZDNet blogger David Berlind](#) has examined the trade-offs and concluded that “staying with one of the other all purpose languages would probably have done very little to fix the lock-in problem [but] might have sacrificed some of the optimizations that empower developers to more quickly and easily harness the salesforce platform...salesforce.com ultimately made the right choice for itself as well as its customers.”

On beyond code

In addition to the programming portions of a project, a burgeoning ecosystem¹¹ of PaaS component providers offers bulk storage, computational capacity, financial application functions, and social networking frameworks among many other service offerings that developers can incorporate into their projects.

Platform as a Service is not just a concept, but a reality that’s ready to bear enterprise workloads today.

¹⁰ 28 May 2008, “13 reasons why Ruby, Python and the gang will push Java to die... of old age,” Daniel Pietraru, [littletutorials.com](#)
¹¹ 7 May 2008, “Marc Benioff heralds Web 3.0 at DreamForce Europe,” Phil Wainwright, [blogs.zdnet.com](#)

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