Trend Wars
Web 2.0 and Enterprise IT

Hello, everyone. My name is Dejan Milojicic and I’m an editor of IEEE Internet Computing and IEEE Distributed Systems Online. This is another installment of the Trend Wars interview series. DSO will host the long version and a podcast of the interview, while Internet Computing will publish an excerpt from the interview. Today, we’ll be talking about Web 2.0 and enterprise IT.

According to Wikipedia (http://en.wikipedia.org/wiki/Web_2.0), Web 2.0 refers to “a perceived second generation of Web-based communities and hosted services—such as social networking sites, wikis, and folksonomies—which aim to facilitate collaboration and sharing between users.” Web 2.0 is especially widely used in the consumer space for those people who are their own IT administrators. Today, we will, however, focus on enterprise IT.

It is my pleasure to introduce to you three distinguished guests: Rich Friedrich, director of the Enterprise Systems and Service Lab in HP Labs; Dave Cohen, the chief technology architect of Merrill Lynch; and Alex Dreiling, the research program manager at SAP Labs in Brisbane. These three distinguished guests represent and cover almost the whole space of enterprise IT. They represent an infrastructure company, an applications and services company, and a financial vertical. Hopefully, they’ll be able to touch on all aspects of Web 2.0.

—Dejan Milojicic

Let me start with Rich. In your mind, Rich, what are the benefits of Web 2.0 for modern IT, and, if possible, could you please focus on what the data-centric nature of Web 2.0 means to enterprise IT as opposed to the normally control-centric nature of IT? What do the long tail and economies of scale mean for enterprise IT? And finally, given this whole direction, is enterprise IT really converging toward SMB [small and medium business] and consumer space?

Rich Friedrich: When I think of Web 2.0, I think of two distinct attributes. First of all, there’s the data-centric mechanisms. We think about mashups and related technologies. But I think more important is the community aspect, the ability to build portals and share information and have that sense of community where the knowledge of the community is able to permeate everyone who’s a member of that community. I see both of those as very powerful elements inside the enterprise.

From the sort of data-centric point of view, it’s the ability to pull data from various applications, to create new visualizations of that information. So, for example, you can imagine creating a CIO dashboard where the information about the business is done through mashups from various applications. It’s a powerful integration tool. But I think the real power is in the sharing of the knowledge and the collective wisdom of the community, and that’s also provided by Web 2.0 technologies.

What’s really interesting, I think, will be this challenge for IT: as IT organizations try to become more standard and create components that are reused, people want to use Web 2.0 technologies to create new applications on the fly.
So, for example, I had a student working with me for the summer who did a mashup of the enterprise
directory and the HP Labs technical reports, so now you can get an instant view of who’s published
what inside the company. That was done without IT being involved and, of course, those kinds of
capabilities will become more pervasive throughout IT.

Thank you. In the spirit of Web 2.0, we have even conducted this interview geographically
distributed. So Rich and I are sitting here in Palo Alto. We will now switch to Manhattan
using Halo technologies and talk to Dave Cohen, and subsequently, Alex Dreiling will talk to
us from Boeblingen, Germany. Dave?

**Dave Cohen:** So, the convergence with Web 2.0 is really, I think, an interesting inflection point in
that people who use technology expect instant response. IT has traditionally been in the way of
instant response. So users are very sophisticated in getting around IT. Over time ... I think back to
Lotus 123 and Excel and look at today and the sophisticated nature of what’s built on those
reasonably unsophisticated tools.

Now, when you look at Web 2.0, it is a reflection on or against all of the client-server infrastructure,
all of the Web services infrastructure, all of the really structured things that IT puts together. Those
tend to be constraints because they take too long to deliver. They are too complex to support. I think
people are crying out to collaborate and to get at data without having to go through the middle layer
of IT. I think that’s really what the convergence is all about.

Thanks, Dave. Alex, what are your thoughts?

**Alex Dreiling:** Well, I guess the major innovation happens along three dimensions. The first one
would be technology. Look at Ajax, for instance, what Ajax has done to Web applications. Previously,
Web sites were mainly for accessing information, reading up on something, maybe getting a form to
input some data and send some data back. But these days, actually, if you look at an Ajax-based
application, the whole user behavior is radically changed. Moreover, Ajax enabled us to bring full-
blown applications into a browser, so the browser is no longer just a reading tool. It’s more like an
application framework. So, this is, I guess, the first one.

The second one would be innovation along applications where you just see—these days, for instance—
something like Flickr. Fifteen years ago, I didn’t see people gathering, throwing a hundred pictures on
the ground, and sort of looking through them. It’s an entirely new application and something that
really arises with Web 2.0 principles.

The third piece of innovation, I guess, is along the business. You see that these days whole new
branches of the economy and whole new business ideas arise from that. Look, for instance, at
YouTube. Just by building that massive repository, which users contribute to, led to Google buying
them for massive amounts of money. And just at a time when a lot of people struggle with how
Google actually earns money. Again, this wasn’t possible about 15 years ago.

Along those three dimensions, I see major innovation happening. I guess this is leading to ... IT has a
lot more to offer to business these days and—as Rich and Dave already said—partially without
including IT these days anymore.

Thanks, Alex. My next question is, how does Web 2.0 fit into the broader ecosystem? In
particular, what are the most important abstractions, platforms, and approaches that will
impact IT—for example, service-oriented architectures, virtualizations, software as a
service, et cetera? What are the next—the most important customer problems? How will
Web 2.0 address them, if at all? The last question is what are the needs of ISVs
[independent software vendors] and service developers, and what will make them adopt or
reject Web 2.0 approaches?
Can we start with Dave this time?

Dave: I think there’s a journey that we have to go through, because the fundamental assumption is that everything—at least in financial services—is redundant, and failover is an absolute requirement from the physical, electrical, all the way up through the software. [This] is directly opposed to the Web 2.0 value proposition.

In order to reconcile the requirements of these two opposing ends of the spectrum, there needs to be some mediation layer that falls out of this. Because the reality is, you want to trust the infrastructure in the same way you trust the phone system or the water system. But you want it to be just as simple. That simplicity is really what’s missing today on the IT side of the world.

The complexity on that side is driven by all of these very, very structured, top-down, almost draconian constraints that we somewhat arbitrarily impose. If you talk to business people, they want to trade off between those types of requirements and getting at their data at the speed of light. That’s the challenge.

That challenge is not going to be solved today or tomorrow.

Thanks, Dave. Alex?

Alex: I guess we’re referring to what Dave just said. SOA [service-oriented architecture] is the major abstraction principle here. We see more and more data repositories on the Internet being opened up and are now accessible via Web services. SAP has done the same thing, opening up the entire application range to be accessed by enterprise services, which, in fact, enables all those mashups and all the things that process composition on the fly, all those things that you want to be able to do these days.

In terms of abstraction principles, SOA is really what sort of enabled that on a larger scale in the enterprise base. When it comes to customer expectations, when you look at the innovation cycles that you have these days, and also the external pressure—for instance, through legislation, the way Sarbanes-Oxley came up within 12 months, or different things like environmental thinking and the pressure that creates on companies—then I guess user expectation and external forces are changing so rapidly that companies have to be able to really react to that very quickly.

This is the major challenge that has to be addressed by Web 2.0 technologies—to really enable a type of flexibility that hasn’t existed before to be able to cope with this constant change.

Thank you. Rich?

Rich: I think Dave and Alex hit on most of the key points. I would add only two things. We hypothesize these days that as the world moves toward SOA interfaces for those services, Web 2.0 technologies might be the glue layer that helps you glue some of those pieces together, especially across a multicompany supply chain or a distributed environment such as that.

The other thing that’s interesting from a user point of view is this whole notion of data integration. Dave touched on this earlier. IT often is seen as being very inflexible and very rigid, and yet the user wants information and wants it now. What’s really intriguing is, as we open up these repositories, can we open up the enterprise repositories and the operational repositories to now get a single view of the truth? We couldn’t do this before because different applications lock down different sets of data in their own data repositories.

Now that generates another set of issues that Dave already hinted at when it comes to security and access-control policy and Sarbanes-Oxley. So clearly we need additional technologies in place to assure those capabilities are there as well.
I remember being involved in the OSF [Open Software Foundation] distributed computer environment in the early nineties and Corba. I carry those scars, and I’ve carried those for the last 15 years. We built incredibly rich environments that we thought a priori could handle almost anything. I think in reality they could. What happened was HTTP came along, very simple, and people were willing to trade off all of this richness and security and access control and marshalling and unmarshalling of data for something that was good enough. I think the point here will be, how do we find in Web 2.0 technologies, especially inside the enterprise, that which is just good enough.

Thank you, Rich. My last question for this very insightful group of people here is, what is your personal and your company’s vision for computing, be it with or without Web 2.0 in the next five to 10 years? If you can, while answering this question, focus on three aspects. What does your company need from the rest of industry and academia to reach this vision? What do you believe is most critical for your customers? The last question is, what advice do you have to offer this audience?

Alex, maybe we can start with you this time.

**Alex:** My company’s vision is subject to be communicated by our executive board and CEO, of course, so there’s nothing to it. It’s clearly outlined. What we can add from an SAP research perspective—and we’re just at the beginning of this journey—is that we’re deep-diving into this space of service-oriented architecture or enterprise service-oriented architecture. Of course, I understand all the mashups and everything. It’s very fancy. It’s very flashy. We want to have it right now.

But the point is, in enterprise computing, as Dave has already mentioned, we have things like sophisticated authorization, authentication, privacy means, and plays. Mashing up data is just a bit more complicated in that space. So there are remaining research challenges that we have to address in order to make that happen on a larger scale here.

So, academia, I guess, has been addressing these issues. It’s been addressing scalable architecture before having that information instantly. We don’t want to wait for it a couple minutes or even seconds. A scalable architecture is certainly one virtualization of services that decreasing complexity of services, making them consumable, so lean consumption would be something. We have interoperability aspects that we need to address.

We have cementing aspects that we have to address in order to make that SOA story really happening across various players, various repositories, both from the Web and enterprise applications.

Thank you, Dave. Rich?

**Rich:** I think Mark Hurd, our CEO, has made it pretty clear that HP strategy is around these three notions of the next-generation data center, the always-connected mobile experience, and digital printing and imaging. When I think about IT and some of the work that we’re doing in HP Labs related to research for the next five to 10 years, I think one key element is the notion of the cloud—computing done in the cloud. I think that’s an evolution of client-server computing as well as the combination of Web 2.0.

If you think about that, I think there’s some very interesting questions, some of which we’ve already talked about with respect to answering the previous questions that you asked, Dejan. But as Alex mentioned scale, I think in academia we have failed at being able to put together what I’ll call the “science of large-scale systems.” If we’re aeronautical engineers, we don’t typically build a Boeing 757 or a new Airbus 380 without going through a series of incremental developments including simulations and wind tunnel testing before we deploy an actual product.

But yet, in computer science, we hack things all the time and then wonder why it collapses. So I think this is the one important area: the science of large-scale IT.
Alex also talked about semantics. There’s a huge semantic gap between what I’m trying to achieve semantically and how syntactically I have to configure all of the software and the hardware to make that happen. I think [this] also points to another challenge all of us face, and this is more a sort of personal reflection.

If you think about it, we have certain personas throughout the day. Sometimes I’m the director of a laboratory. Sometimes I’m a peer with my colleagues. Sometimes I’m the father of two teenage daughters. We move in and out of those personas, yet the data we need to access is often in isolated repositories that can’t be shared.

So if my daughter calls, she doesn’t know that I’m currently in this video conference, right? But there’s no reason why she couldn’t see on my calendar that I’m not available right now and not even try to call. These are simple things that I think reflect how complex our lives have become, yet I think we could simplify those things. So those are some of the key areas that are really important when we start to think about IT and the applications and data for the next five to 10 years.

Thank you, Rich. Dave?

Dave: Just to point back toward the management of Merrill Lynch and senior executives across financial services, the reality of information and the desire to access information [involve] a transformation of data stored somewhere in the synthesis of that information through computing.

That computing happens at the edge of the network wherever people are. For our customers, that’s a global distribution problem. It is definitely planetary scale, but obviously, pushing the data to the edge of that network becomes very suspect and undermines the trust of the infrastructure itself. That’s really the key. I think that’s why the rhetoric in the marketing side of the world talks about utility, because trust is all about utility.

How do we manage the central data repositories and deliver things that people need? That’s very consistent with all technology that’s been developed since the beginning of the industrial revolution. This isn’t about computing as a marketing function, but more about an engineering problem for planetary scale.

That’s really the challenge that we as IT personnel have to solve.

Thank you very much. This was exceptionally insightful for me. I’m sure it will be equally insightful for our audience. I would only like to conclude with the announcement of the next installment. We will most likely address software as a service as the next topic in the next few months.

Thanks again, Rich, Dave, Alex. It was a pleasure talking to you.

All: Thank you.

A digest version of these interviews will appear in IEEE Internet Computing, vol. 12, no. 1. The next installment will cover software as a service.

Cite this article: