



Shantanu Narayen on Adobe's Future Direction: Product Strategy for the Next Generation of the Web

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A key element of what has been called "web 2.0" -- along with ideas such as user-generated content and social networks -- is the concept of "rich Internet applications" (or, as Microsoft recently termed them, "rich interactive applications"), which use the web as a platform for new types of online experiences. From delivering browser-based software that functions like a traditional desktop application to providing immersive video experiences online, a new generation of Internet-connected applications is beginning to evolve. And several technology companies are vying to lead the way.

Currently, Adobe Systems may have the strongest hand in this emerging arena of web-enabled applications. And the company's recent whirlwind of announcements seems designed to secure that lead.

On March 27, Adobe announced Creative Suite 3, the new version of its print, web and rich media authoring tools, and the largest product release in the company's 25-year history. A few days earlier, the company released a public "alpha" (early pre-release version) of its Apollo platform on Adobe's "Labs" web site. At the National Association of Broadcasters (NAB) trade show on April 13, it announced the Adobe Media Player, a forthcoming desktop application built around the video capabilities of Adobe's Flash platform. And on April 26, Adobe announced plans to release the code for its Flex software development kit under an open source license.

Behind this flurry of activity is an attempt to establish the company's development tools and software platforms -- including Flash, PDF and the forthcoming Apollo -- as the foundation for the next generation of interactive web-enabled applications.

The company with the most to lose if Adobe succeeds is Microsoft. Although Microsoft's operating systems, productivity applications and server products still generate a significant majority of its revenue, as Microsoft chief software architect [Ray Ozzie recently discussed with Knowledge@Wharton](#), the future is in software built around web-connected services, and Ozzie even noted that Adobe's strategy in this arena "is basically the same as Microsoft's."

Microsoft's recent product announcements underscore the increasing competition between the two companies. Microsoft's Expression Studio includes design, illustration and web development tools that target Adobe's strongest market -- creative professionals. And on April 15, 2007, Microsoft squared off against Adobe's Flash platform when it officially unveiled Silverlight (previously known as "Windows Presentation Foundation Everywhere"), a web browser plugin to deliver rich web-based applications and video to Windows and Macintosh users.

This past week Sun Microsystems, an early contender with its Java language, entered the fray by announcing JavaFX, a forthcoming scripting language with apparent similarities to Microsoft's Silverlight and Adobe's Flash.

Along with CEO Bruce Chizen, much of the responsibility for addressing these challenges falls to Adobe president and chief operating officer Shantanu Narayen. Narayen grew up in Hyderabad, the younger of two brothers, and moved to the U.S. in 1984 to pursue a Master's degree in computer science at Bowling Green State University in Ohio, where he met his wife.



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After graduation, Narayen and his wife moved to Silicon Valley where he landed a position at Apple. By studying nights while working at Apple, Narayen earned an MBA from the Haas School of Business, UC Berkeley, in 1993. Following Apple, Narayen did a stint at Silicon Graphics and then founded Pictra, an early entrant into the field of online digital photo sharing. Narayen joined Adobe Systems in 1998 and was appointed president and chief operating officer in January, 2005.

In the first of a two-part interview with Knowledge@Wharton, Narayen discusses the details behind the company's recent product announcements. An edited version of that conversation follows.

In [the second part](#), published in [India Knowledge@Wharton](#), Narayen talks about how India is key to the company's global growth strategy.

Knowledge@Wharton: Adobe introduced Creative Suite 3 on March 27, reportedly the largest software launch in Adobe's history. How has the response been thus far?

Narayen: We've started shipping [some editions of Creative Suite 3] and the response from our customers has been very positive. It's a massive step forward in a creative professional's ability to deliver content across print, web, video and wireless. I think people were blown away by the amount of in-depth integration and workflow that we were able to provide so quickly after coming together with Macromedia. We're very pleased.

Knowledge@Wharton: While the official unveiling was on March 27, the launch date was well known in advance. Some companies, like Apple, are obsessive about secrecy until a product is officially announced. Other companies promote their plans well in advance. How do you determine when you're going to get the word out about a new product?

Narayen: One of the clear trends we are seeing is that it behooves us to involve the community in the development of the next generation of applications. Being transparent about our plans enables us to get better feedback so that we can deliver better solutions to our customers.

With Apollo, we're targeting the developer community. And with Lightroom we did a public beta very early in the process to get customers to try the software and give us feedback. Lightroom is a much better product as a result.

With our Labs site we will continue to put things out there to get customer feedback to help us deliver better products.

Having said that, we also recognize that when we pre-announce products, sometimes people tend to stall their purchases because they're aware there's a new product [coming out]. So there has to be a balance.

In retrospect, maybe announcing something nine months ahead of schedule -- [like] when we said Creative Suite is going to ship in the second quarter -- might have been a little premature. But, right now, the buzz is there in the industry. People are trying to rally around when they can build their ecosystem of products at our launch. We're trying to be better partners with people who need that information to do a great job.

Knowledge@Wharton: The first two products you named were new "1.0" products, where there seems to be no disadvantage to announcing early. Is the strategy different in the case of a product like Creative Suite where there is a previous version that customers can purchase?

Narayen: We look at it on a case-by-case basis. With Photoshop CS3, we put out a [public] beta because people were transitioning from the Power PC to the MacTel architecture, and we wanted to make sure that we got it right. These products are getting more complex, so it's always this balance between secrecy and getting a bigger bang for what we do.

Knowledge@Wharton: You recently announced plans to open source the Flex SDK. Exactly what is Adobe doing and why?

Narayen: Open standards have always been a core part of how we've tried to deliver technology platforms -- whether it was with PostScript, PDF, or our [recent] announcement of open-sourcing the

[Flash ActionScript] virtual machine working with the [Mozilla Foundation's] "Tamarin" project.

Specifically as it relates to Flex, as we work more on enabling rich Internet applications for the web and new Apollo applications for the desktop, we want more developers to participate in the growth of this framework. By providing the Flex [SDK] as open source under the Mozilla Public License, we believe this will enable more developers to help contribute.

One of the key initiatives under web 2.0 is about involving the community in moving the entire industry forward. We think this will help [developers] overcome any objections they might have.

Knowledge@Wharton: While this may be good for developers, how does it help Adobe's shareholders?

Narayan: We will also continue to deliver products [with] Flash and Flex on the desktop [and with] server products. Take the analogy of Acrobat. PDF has always been an open specification, and we found a way to monetize it, both with Acrobat on the desktop as well as, increasingly, with LiveCycle on the server side for enterprises. Using Flex to deliver rich Internet applications enables [our customers] to do enterprise-wide data services, which will be an opportunity for us.

We also think that Apollo is an opportunity for us to build brand new applications. The Adobe Media Player, which was one of the other announcements we made, is a new desktop application built on top of Apollo. We will be able to monetize the Media Player by enabling companies that want to deliver content for commerce, through our server DRM [digital rights management] offering.

So we believe we have multiple monetization opportunities.

Knowledge@Wharton: You mentioned the announcement of Adobe Media Player. Flash already plays a significant role in delivering video over the web. What will the Adobe Media Player add?

Narayan: First, as you point out, Flash video as been proliferating on the web and we've been very pleased with that. In talking to customers, we've found that they would like the ability to have the Flash video player offline as well as online. Today, Flash video works within the browser with content streamed from servers anywhere over the Internet. But you might think about movie download services that want to use Flash video to deliver movies to a desktop with the ability to play offline. Consumers may have a number of Flash video files on their desktop and the Media Player will allow them to manage those.

Second, as we start to look at offline, we want to help our customers monetize this media. The Media Player will also have the ability to do digital rights management for this content.

So, for content publishers it provides new abilities to distribute and track media. For consumers, it allows them to have a far more compelling experience with all their media assets offline.

We're also looking at how we make sure that Flash video works all the way from the desktop to mobile [devices] and extending to HD [high definition] quality. [The Adobe Media Player] is really the next logical step of that entire video publishing workflow allowing Flash video to be a more compelling format.

Knowledge@Wharton: As you've said, the Media Player will add DRM capabilities to Flash video. Will the same DRM features then be added to the Flash browser plugin?

Narayan: We're certainly evaluating that. We're talking to a number of our customers about how they would like us to deploy [the Media Player] online as well as offline. Phase one is -- let's make sure the Adobe Media Player allows our content publisher partners to provide these capabilities.

Clearly, the Media Player will be cross-platform, which continues to be one of the core tenets of Adobe.

Knowledge@Wharton: You mentioned Adobe's forthcoming Apollo platform. Macromedia had a product called Central, which had some of the characteristics of Apollo, but it never really caught on. Why will Apollo be different?

Narayan: When we were separate companies, both Macromedia and Adobe independently recognized

that the web as it exists today has some very significant limitations in terms of the user experience. We're trying to overcome those deficiencies.

As you point out, Macromedia had a project called Central. Adobe was working on its own product code named Metro, later called Tahoe. We recognized that if people can harness the power of the desktop and yet have the connectivity of the Internet with a compelling, rich experience, there are new applications one can build. Both companies shared that vision. Even as we were talking about combining the two companies, in conversations with Kevin [Lynch], it was clear that we shared that common vision.

[There are a couple of reasons] why we think [Apollo] will be different. One is that today we're leveraging the power not just of Flash, but also of PDF and HTML, which is a significant difference in strategy. Second, we've been able to get a common scripting language that we believe will enable people to extend these applications.

Third is the developer community. [For example,] on the PDF side [we've been] getting more developers to adopt PDF and now we're making it an open standard. [Similarly,] Flex and Flex Builder [have been gaining developer support].

I think we've just evolved. And sometimes the timing has to be right. [Some things are just] ahead of their time.

Knowledge@Wharton: Microsoft has officially announced Silverlight, which appears to have a number of characteristics of the Flash platform. You've competed with Microsoft in the past, but to many observers it seems like a new, head-to-head battle is brewing. How do you view Microsoft as a competitor in this rich Internet application space?

Narayan: First and foremost, it's a validation of what we've been talking about. It's pleasing in the sense that people are seeing what Macromedia was talking about with respect to rich Internet applications and what we've been saying about providing compelling experiences and combining the power of desktop and connectivity of the web. It's good to see all the industry validation.

Specifically [in regard to] Microsoft, I would say, first, that we've been in this business for a while. Flash Player is installed on approximately 98% of Internet-enabled desktops. Flash has been driving the web video revolution for some time. We're clearly the incumbent.

A characteristic that distinguishes Adobe's strategy from every other company is our strong belief in cross-platform as a core tenet -- not just cross-platform across Mac, Windows and Linux, but also, increasingly, across non-PC devices. With Flash Lite and FlashCast, we've been focused on [mobile services] for quite a while. Adobe has demonstrated its commitment to cross platform development vis-à-vis Apple platforms as well as Windows and alternate devices. Macromedia had done the same thing.

I think it's a huge market opportunity. We have to continue to leverage our core strengths, which are, [first of all], the authoring [environment]. Let's not underestimate the fact that all this content is being authored in our applications. Plus, we have this cross-platform playback [software] that is already ubiquitous. And we're pushing the envelope with the Media Player and Apollo. So we're not standing still.

But the fact that it's a huge market opportunity will attract other competitors, including Microsoft.

We believe that the user experience is what's going to distinguish this next generation of applications. We welcome other companies to participate in this revolution. We like our ability to succeed, given some of the fundamental tenets that we believe in.

Knowledge@Wharton: It also appears that Sun [Microsystems] is moving into this space as well, with their recent announcement of JavaFX. Will all this competition help the market or will the fragmentation that could result stall the market? Wouldn't we be better off if there were one standard platform for RIAs?

Narayan: I think choice for customers is always good. From our perspective, the more we can have things be built on top of standards, the better it is. And our Apollo vision has always been about leveraging existing standards -- the Flash standard, the PDF standard, but also HTML because we believe

that's one of the existing standards out there.

From a scripting perspective, we are looking to standardize scripting across all these platforms with what we are doing with ECMAScript and [open-sourcing] the virtual machine [through the Mozilla Foundation].

It's great to see the innovation that's happening. It's good for the industry.

But I think we will have multiple standards. I don't see a scenario in which everybody coalesces around one standard. That's been representative of the computing industry since its inception, so I don't think it's going to change anytime soon.

Knowledge@Wharton: As you've said, one thing that makes Flash attractive as a platform is the broad distribution of the Player. Developers can count on it "just being there." However, Flash is no longer included with [Microsoft's] Internet Explorer 7; it doesn't come bundled with FireFox. How big a concern is this? And, related to this, how are you going to get the runtime [environment required to execute Apollo applications] distributed broadly?

Narayan: First, We're super-thrilled with the adoption of Flash 9 across computing desktops around the world. The adoption has been incredible because it's such a seamless update experience. And the fact that people are moving to new Flash content enables us to really quickly get Flash 9 out there.

With respect to Apollo, there are two things. One is that we have our own vehicles to enable our customers to get the distribution they want for Apollo. But, in addition to that, we expect that the new generation of Apollo applications that will be created will also spur people to get Apollo on their desktops. If you get the [Adobe] Media Player, you get Apollo with it. There are a number of third-party developers who are also building some very compelling applications, all of which will help us distribute the Apollo runtime.

Knowledge@Wharton: You've mentioned standards a couple of times. Through AIIM [the Association for Information and Image Management], you recently submitted the PDF specification for approval as an ISO [International Standards Organization] standard. What drove that? You already have [versions of PDF like the archival version] PDF/A as published standards. What motivated moving the full PDF spec to standardization?

Narayan: It was really the next step in the strategy. PDF/X was adopted by the pre-press industry many years ago. We have PDF/A for archival, PDF/H in healthcare, and PDF/E in engineering. It became increasingly clear that there would be significant merit to doing that for all of PDF.

And, as you know, PDF has been an open specification from day one. So it's just a continuous move by Adobe to involve the community in moving our technologies forward.

Knowledge@Wharton: But, as you pointed out, PDF has been documented from the beginning. So what's new here? What difference is there in making it an ISO standard?

Narayan: One of the pieces of feedback that we got was that by working with standards bodies and making it a formal ISO standard, more people were willing to participate in the evolution of that standard. I think ownership of that standard then becomes something that more people feel passionately about.

Knowledge@Wharton: But won't Adobe still control the development of PDF?

Narayan: Well, there are multiple [implementations] of PDF writers as well as PDF viewers. We will continue to innovate around the PDF specification. But this welcomes the community to the effort as well.

Knowledge@Wharton: As you just mentioned, there are a number of companies that have software to create PDF files. One of them is Microsoft, which now makes PDF creation available for Microsoft Office 2007. There was apparently some disagreement about its original plans to include that capability in the product. What's Adobe's stance on that?

Narayan: Well, first, you can't always believe what you read in the press.

Knowledge@Wharton: That's why we're asking.

Narayen: Adobe has always maintained that PDF is an open specification. As long as companies support PDF in the [original] spirit -- that is fine with us. Specifically, if companies use monopoly power to further their own interest, that's where we have an issue. But we welcome competition on an equal playing field. Whether it's Autodesk or Microsoft, there are many companies that support PDF.

We recognized many years ago that we needed to focus on higher value uses of PDF -- things like digital signatures, review and mark up, redaction, collaboration, and the ability to embed 3D objects with Acrobat 3D.

So what you've seen us do is segment the product line. We now have Acrobat Elements, which has basic PDF creation. But we find that our customers are increasingly moving [to the higher-end products] -- whether it's Acrobat Standard or Acrobat Professional or, now, Acrobat 3D.

Our focus moving forward is: How do we continue to build end-user value based on PDF as a standard?

Knowledge@Wharton: Just so it's clear -- we had originally heard that Microsoft planned to include PDF creation with Office 2007. It's now available for free as a separate download. It sounds like you would have been okay with Microsoft including it in the product, as long as the PDF standard was respected in terms of the way it's documented.

Narayen: We have responded, rather than initiated, when regulatory bodies have asked us questions about Microsoft's support for PDF. It is our belief that as long as people compete with us on a level playing field, we welcome any competition.

Knowledge@Wharton: Don't many people buy Acrobat principally to create PDF? As PDF creation becomes more ubiquitous -- whether in the Apple operating system, Microsoft products or other tools -- isn't this a challenge in terms of your revenue stream?

Narayen: A couple of things. First, we are seeing Acrobat Professional as the product that's driving a fairly significant portion of our revenue. Acrobat Professional has a number of features [beyond PDF creation] such as the ability to create and fill out forms and do more collaboration. So we're increasingly seeing people adopt the higher value uses of PDF. Acrobat Elements, which is the product that does just basic PDF creation, is actually the smallest portion of our Acrobat revenue.

While we continue to increase the core value of PDF across horizontal usage, we're also making sure we understand vertical workflows and deliver higher value usage to those customers.

Knowledge@Wharton: Do you see that growth coming rapidly enough to offset any decline [in revenue] from people who [previously bought] the product for PDF creation?

Narayen: The revenue for Acrobat continues to do well. There are approximately 80 million knowledge workers who represent the available market opportunity for Acrobat. The revenue for Acrobat today is driven a lot by new units rather than upgrades. The business is really new customers adopting the PDF platform. We believe there's significant headroom there.

Knowledge@Wharton: While we're clearing up fuzzy news stories -- there was a published report that Adobe has plans to release a hosted on-demand version of Photoshop. How will this work?

Narayen: Whether it is image editing or video editing, we want our brand and our technology in front of as many customers as possible. We believe software delivery through hosted services is going to become more common. You've seen that we've already done something with video editing in partnership with Photobucket. We want our imaging brand, as well, in front of customers. Beyond that, I'm not announcing any products today.

Knowledge@Wharton: In terms of your current offerings, Adobe appears to be supporting a number of overlapping products. You have Dreamweaver along with GoLive. You have both Fireworks and Illustrator; Photoshop and ImageReady. Is it a challenge to support such a broad spectrum of products, many of which have similar or overlapping features?

Narayan: Each of the products you've mentioned -- and there are others such as InDesign and FrameMaker and PageMaker -- have a very broad spectrum of customers, with features available in certain products that are not available in other products in that genre.

Let's take the professional page layout market, for example. While InDesign is the center of focus, the features to do large document publishing and XML publishing are more advanced in FrameMaker. So we expect our customers to use FrameMaker for that purpose.

Similarly, FreeHand allows the ability to do multiple page composition for vectors that Illustrator doesn't support. Each of those products has achieved a certain amount of success by having key features that appeal to certain customers. Clearly, Photoshop, Illustrator, InDesign and Dreamweaver appeal to the broadest spectrum of customers, and that's where we've put in the most focus. But we will continue to support all those other products.

Knowledge@Wharton: So you see these products having a niche of their own, rather than consolidating them by adding the good features of the others onto the core product?

Narayan: We will continue to extend the capabilities of the core product in each of those segments with some of the features that are available in the other products. But, yes, it is our goal to continue to make sure that we don't leave any customer behind. For a number of customers who have adopted a product like FrameMaker, we will continue to invest in it.

Knowledge@Wharton: In discussing [Adobe's India strategy](#) you emphasized the importance of the mobile space. In the U.S. at least, it appears that J2ME Java applets are more common on cell phones than Flash. Have you found it challenging to get your mobile platforms onto handsets in the U.S.?

Narayan: Our core strategy in the mobile space is, first, to make sure we have the Flash user environment available on as broad a set of handsets as possible. Flash is being used for a couple of different purposes on those devices today -- to browse the web and to create a compelling new user experience. Increasingly, it will be used to deliver services with a TV-like metaphor or a channel metaphor on these particular devices.

The good news is that we have relationships with most of the major handset manufacturers. As you see new handsets being introduced into the U.S., I think you will see the volume of Flash-enabled handsets increase year-in and year-out. We just announced at [the] 3GSM [conference] that we have over 200 million alternate devices that are now shipping with Flash. A lot of that was driven initially by Japan, but now over 70% of that volume is being driven outside Japan. You are seeing the new generation of phones shipping with Flash.

I think Apple's entry into the market with iPhone is only going to enhance the importance of the user experience on handsets across the spectrum, which plays to our strengths.

Our strategy is: Make sure we get relationships with all the major handset manufacturers, which we have. As the new phones enter into the U.S., you will see them being Flash-enabled. And we're working with the operators. We're now working with Verizon and Qualcomm to make sure content that's being downloaded through the BREW [Binary Runtime Environment for Wireless] network also has the ability to download Flash content.

We're also working with operators -- whether it's Telenor in the Nordics or DoCoMo in Japan -- to offer new innovative FlashCast services. As you see these FlashCast services also enter the U.S., you will see more handsets where it's obvious that they are being driven through Flash. It's early. I would say the U.S., in general, was probably a few years behind in terms of the telecom revolution. So stay tuned. There are some exciting developments coming up.

Knowledge@Wharton: What is the future of PDF on mobile devices? You have PDF readers for the Palm and Pocket PC platform, but we haven't seen new developments in that space for some time. Is that because you see Flash as a more significant growth opportunity there?

Narayan: There are customers who will require both. For example, as the set-top box becomes more a

part of the living room to [do things like] browse the web, we believe that represents a great opportunity for PDF support.

PDF on alternative devices is central to our strategy. Some are devices that we port ourselves; for others, we partner with people by providing them an SDK [software development kit] and working with them to port the PDF reader to their environment. You'll see more instances of both of those applications over the next year.

Knowledge@Wharton: In discussing India, you also mentioned that Adobe is now selling into the enterprise space. You've been doing this for several years now. How pleased are you with the progress that you've made?

Narayan: We're pleased. More and more customers are starting to see the benefit of automating inefficient manual processes. We have been focused primarily on regulated industries, because the amount of paper used in regulated industries is large. Whether it's financial services, government or manufacturing, we now have customers who have seen significant ROI using our solutions.

What's exciting moving forward is that we intend to combine our Flex technology so that we can offer the CIO a more complete solution by having an immersive experience on the web, as well as automating their workflow and having a statement of record.

The core strategy in the enterprise space is to bring together people, information and processes. A combination of LiveCycle and Flex allows you to do that. The enterprise is now approximately a \$200 million business for Adobe. It's a meaningful revenue stream.

Knowledge@Wharton: We've talked about Apollo quite a bit -- what's your vision for it? If Apollo is successful, what will people be able to do that they can't do now?

Narayan: I think we'll witness a new generation of applications that people haven't even imagined yet because we will spur creativity among developers. You'll have the power of the Internet combined with the desktop to deliver new engaging experiences with which people [can manage] all the information and media assets they have.

We're excited about Apollo and new applications like the Adobe Media Player. What's really cool is when you see other companies build applications [based on Apollo] -- whether it's the compelling new application eBay is working on that significantly increases the user experience of doing auctions on the Internet, or BuzzWord by Virtual Ubiquity that shows you how you can have something as common as word processing done very differently. If that drives the imagination of other developers to build cool new applications that you and I have not even imagined, that's when Apollo will really be a success.

Stay tuned. It's going to be exciting.

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