



**Transcript of podcast with:**

**T.V. Raman, Research Scientist, [Google, Inc.](#)**

Chauncy Rucker (CR): Welcome. I'm Chauncy Rucker. I'm at the 2008 Technology Innovators Conference. It's hosted by the National Center for Technology Innovation and the theme this year is "Thriving in a Global Marketplace." I'm having a conversation with T.V. Raman. He's a research scientist at Google. Raman, I'd just like you to tell us about what you've been talking about here, your expertise in terms of accessibility on the web.

T. V. Raman (TVR): Thank you. So I talked yesterday briefly about the impact of cloud computing on users with special needs or users with different needs, however you'd like to think about it, and it's a very exciting time on the web. To an extent, as the various Web 2.0 applications and technologies have gotten deployed, users with disabilities in some sense have seen the rough end of it because we are essentially transitioning to a new generation of technology. To some sense, as we've sort of bridged over to new technology, there's been some growing pains, but what I'd like to give you a sense of is how this sort of evolution to moving to a world where applications are delivered over the web is actually a very exciting move for users with disabilities.

To sort of understand why, you need to step back and take a quick look at how the web works and how web applications work. I'll try to stay as non-technical as possible. It's sort of important to understand the underlying technology even if you don't work day in day out with the technology because all of us do interact with the web. So the web is actually built on some very simple technologies though it might look very complex to you today as a worldwide global thing.

The web is actually very simple. The web's basically built on three simple things. A very simple means for net program you run on your machine called a browser to talk to this program that is sitting up in the server called a web server so there's a very simple protocol that they talk. The web has a means for addressing things anywhere on the web so these are those URL's that you try type into the address bar of your browser and it has a simple language called HTML in which you write your web pages. So those three things make the web and then this web browser that you use is sort of a lens through which you look at the web.

Now what is interesting about the web because of the separation where what you use, the user interface, the buttons you click on, the keys you push, the text fields you see, all of those are **inside** the browser on your machine and then the rest of the logic, the application logic as we call it in the technology space, is actually up in the server; it's in the cloud. So when you are using email, the application logic is about: What email



messages have you read? What messages have you filed? What messages have you marked as trash? What messages have you replied to? All of those things, they live up in the cloud in the server and then what's delivered to you in your browser is the user interface for you to interact with.

Now this separation, the separation between the application and the user interface, is a fairly profound important thing. The reason this is profound and important is that by virtue of having done the separation, we've actually done something that I used to ask for in the nineties from an accessibility perspective, which is, if you look at a software application, you can think of it as having a head and a body. So the head is the user interface and the body is the logic of the application. And when you have special needs, you have low vision, you're blind, you're using a device with a very small display....all of those are different needs and special needs and what the advantage in having separated this head from the body is that then you can screw on a different head. It becomes possible to build user interfaces that suit a user's needs as opposed to building a one size fits all world.

So that's the primary reason this mold of the web is so exciting and you see this all around you. So forget being blind or being deaf, just look around you and see how many ways people use the web. You use the web on your laptop, you use your webmail from your Blackberry, you use it from your iPhone, you use it from your Google phone. So there's the same mail, the same email, that you sort of look at and manipulate from different devices.

Similarly with your calendar, and with calendaring and email and all of these things, the fact that you are touching the same data from different devices is what allows you to basically create an event on your phone and then see it on your laptop, but it gets even better than this. It's not that you get to manipulate your data from many devices, you then get to share your data and collaborate with others who may be using very different devices and at the heart of all web technology. More importantly, at the heart of all Internet technology is a very simple principle which is when you create something, the person who looks at what you created doesn't necessarily need to use exactly the same tool you used to create it.

Email is a classic example of this. When you get an email message, you don't immediately pick up the phone and ask the person what program did you use to send me this email. Email just works. Calendaring on the web today just works. The web just works. You're not supposed to ask which browser should I use to come look at your site. The web just works. When it works correctly, it just works and that really is the success of the web and that really is the potential for users with special needs.

So now as we sort of go through this evolution, where we started with a web which was documents and have moved to a web which is applications, the space of adaptive



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technology has some interesting challenges to overcome and we sort of started doing that in the last three years with additions to the underlying web programming technologies to enable accessibility which is a fairly big step.

But now that those pieces are in there, we now have to start leveraging the rest of the web stack in order to disseminate adaptive technology and I think that's where we will see the next profound set of moves because for the mainstream user, what we have done, is we have taken this thing called the web which was a global hypertext system for distributing documents and that then evolved into this thing that delivered little pieces of software applications as in and when you needed it.

We need to leverage that same mechanism to also distribute the adaptation that is needed for users with special needs. And when I say web applications, it doesn't have to be some huge application. If you're an educator and you've put together an exam for your student, that is a web application today because you can put it up as an online web page with a few check boxes where your student can fill in his answers. That's a little web application. Now wouldn't it be nice if that little web application also came with the necessary adaptation that each of your students with special needs needs? This way if a student does both speech and Braille, you can deliver that to him. If a student needs large print and speech, you could deliver that to him. So you get to this world where one size fits all does no longer count and because we've separated the head from the body of web applications, it becomes extremely affordable and practical, attractable for us to deliver the user interfaces that match the user's needs at any given time.

CR: Fantastic. Thank you!