



Web 2.0 and the future of accessibility: A discussion with Derek Featherstone

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Customer Experience Specialists

Neo Insight Inc.
Suite 374
300 Earl Grey Drive
Kanata, Ontario K2T 1C1
Canada
613-271-3001
www.neoinsight.com

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Mike: Derek, Good morning, and I am glad you could be here, on what I know is a very busy schedule you have these days. What I wanted to do today, you gave a recent presentation on directions that accessibility is taking and I'd like to talk about some of the really interesting things that are going on there.

But I wondered if first we might talk a little about the current situation; quite a few of our clients are government sites and they are facing having to conform to Common Look and Feel 2.0 by the end of this year and what we have seen this year is that there are more interactive applications around now and they are having particular problems meeting some of the accessibility requirements of CLF 2.0. So I wondered if you might have some guidance on what are the most common problems and techniques that these people should be using in their applications?

Derek: Sure, it's a little difficult to say without looking at very specific applications but I know one of the things that we are finding a lot of people struggling with, is you know, how do we deal with accessibility of applications when the current guidelines that we have for accessibility, in particular the Web Content Accessibility Guidelines version 1, were really designed for and written for a document-centric web, so how do we deal with that?

I think there is still a lot of good guidance in WCAG1 in terms of what is required, it's just that things are... we are in a slightly different scenario now so while we used to have guidance that was designed specifically for documents, now we need to take that jump and take a look at what – that guidance was there in the beginning to help people with, say a visual impairment, the guidance might be there to deal with documents in an appropriate way, how do we extend that to providing that type of functionality for someone that has a visual impairment and is using an application, and I think that is one of the biggest challenges right now, is just making that jump from the document centric to the interactive, where we're interacting with things rather than just reading them.

Mike: So I think that the page layout and navigation stuff is still relevant, as you say, one of the things that happened I guess with the Common Look and Feel Round 1 was that there were a number of applications around at the time, for example, interactive mapping, and quite a few of those interactive applications got an exemption at the time, and now they are no longer getting exemption so suddenly a lot of people are having to, you know, climb a steep hill very quickly to get CLF 2.0 compliance. In particular the requirement for applications to still be meaningful if JavaScript or any scripting is turned off. So how do people building these applications, ...how should they deal with that particular requirement?

Derek: Yeah, that's an interesting one. If we were building a use case in a scenario that we need to deal with... I certainly don't want to disregard that but some of the interactivity certainly could be made possible not using JavaScript, it just won't be as snappy. The way that we generally deal with things is that we make sure that there is a fall back just in case JavaScript is not on, but we also go to the extra step to make sure that we are dealing with the use case when

JavaScript is on and assistive technology is in place. We actually go the point of making sure that the JavaScript that is there works properly and appropriately with that assistive technology so while the JavaScript off use case is still there, it's not the only thing we need to take into consideration. So simply by making an application work with JavaScript on or off does not necessarily mean that it is going to be accessible, even though in traditional terms that is what JavaScript accessibility was all about.

Mike: OK, so what are some of the problems then that you have to deal with trying to make JavaScript work properly with assistive technology?

Derek: Well there's a few things really, one is that quite often people, when they are using JavaScript, they will attach JavaScript to random places in their interface. So instead of having a button or a link that they click on to invoke some JavaScript, they will put the JavaScript on a random component in the page, maybe - just to get a little technical - just sitting there on a div or on something else that's in the page that wouldn't normally be functional and that's one of the issues that we see quite often, and that's not necessarily an issue of JavaScript it's where people have chosen to attach the JavaScript .

So the JavaScript, if we want to make sure it works appropriately with assistive technology, it is much more appropriate to put JavaScript on a button or a link than it is to put it on some other random component in the page simply because links and buttons are something that a normal user would interact with regularly, so they are used to interacting with those. Just because we can attach JavaScript to a div doesn't mean that we should. We should really consider placing it on a button or a link or some other mechanism or some other component of the page that actually makes it a bit more sense than just something random.

So that is one of the biggest problems that we see; another issue that we find is that people are tending to use JavaScript and Ajax for everything now and there's not necessarily some thoughtful consideration to which interaction we should be using Ajax for and scripting for and which ones should we not be using them for, and there's a tendency to over-Ajax everything now so every little interaction, even interactions that go off to the server and bring back a large chunk of data that is coming back to the screen, to change a significant portion of the screen, that is something where we should consider doing a more traditional full page refresh if we are changing that much of the page, so we typically look for opportunities to use Ajax where you are only changing a small portion of the page. So when you see something, the starting state of the page, and you click on something and that brings back another version of the page with only one or two small things changed, those are perfect times to go and create an Ajax interaction. There's other times when you are changing 50% of the page perhaps it's not the best use of the interaction or the resources to be using an Ajax based interaction at that point.

Mike: OK, that's a very interesting point. And it reminds me of another issue that we are seeing as well... In the past, if you had a small amount of scripting on your page, if you went through it in a linear fashion as someone does using a screen reader, or going through the structure of the page, it would still be pretty much matching what we see visually on the screen. But what we are seeing now is because people are adding Ajax and scripting in different places on the page it is no longer... the linear representation of the page is now nothing like what sighted people see on the screen. So in effect, developers and designers are having to now design explicitly what the

page will look like in a non-visual presentation and it's really about how should people, developers and designers create a meaningful structure to their pages for non visual representations?

Derek: Indeed, I think that is something we are missing at this point because one of the things we are seeing with some of these interactions is that we are bringing new content into the page or in many cases there is content that is in the page that is just being hidden and saved for later so they are in very bizarre places, you are seeing all kinds of applications where the status messages might be loaded up into the page to start with and then people are using JavaScript or some other Ajax type interaction to selectively show and hide all of the error messages.

If you are experiencing that and you have got all your error messages that are at the beginning of the page it just doesn't make sense as you are reading through in a linear order. Likewise people are going with scenarios where they are doing some sort of Ajax interaction, they are bringing in new content and they are just bringing it into the bottom of the page rather than somewhere that is very close to, say we click on a link and we bring in some new content, it might make most sense to bring that new content and place it right near the link we just clicked on, but quite often what happens is that through convenience or for whatever other reason, the new content is coming in and it is just being put at the bottom of the page with no logical means to get from the link upon which we clicked to get to that new content that has been brought in.

That is exactly the concept we have been trying to advocate, is the idea of having something logical there so we could get some rescue points. If something happens, if something in this interaction doesn't go quite right, how do we recover from that? And having those rescue points within an application are actually very, very useful and the rescue points can be anything, simply from having well structured headings in the page so that it's easy for someone to get around. If we use some type of JavaScript to place somebody in a particular spot on the page or we bring in some new content, we need to reconcile the fact that we might put them in the wrong spot, and if we do that then we need to have some logical places for them to go. So we typically take a look at an application and we'll say, well in this application there's four logical places to go so if we get lost we start over at one of those four places and so we'll typically do things like placing a heading at the beginning of that section that is very clear and says this is what this section does and by doing that we enable people to jump around the page a little bit more easily so that if they do get lost or disoriented we can bring them right back to that spot or they are able to get back to where they were in a much easier fashion than if they were just left all alone.

Mike: And I think it's ultimately a very positive thing that designers do now have to explicitly design that interaction. So... that leads onto the next thing I am interested in, and you mention this, the direction that standards are taking in order to deal with these new developments, in that, the standards seem to be moving in a direction where they are no longer considering the details of the technology and saying for this kind of interaction there must be an ;accessible alternative;, but they seem to be moving more towards task performance as the key. Can you tell us a bit about those standard and how they are moving in that direction?

Derek: Sure, it's really been an evolution of the web context accessibility guidelines. The first version which came out in 1999 was very much focused on HTML-specific techniques and issues and what has happened over time is that people have been, it seems, more interested in

other technologies, they are interested in Flex, they're interested in Flash, in Adobe's Air, in Ajax based interactions and PDF accessibility so what has essentially happened with the new versions of the web content accessibility guidelines WCAG 2.0 it has become a set of guidelines at least in theory technology-agnostic, so there is no longer a specific, there will be specific techniques for satisfying these criteria in HTML, but the core change is that these are a set of underlying principles that can be applied to literally any technology including those that don't exist yet.

Somebody may come up with a new piece of technology tomorrow that they can look at and say "Look at this set of guidelines" and they will have a better understanding of what is required. For example, several of the old guidelines in WCAG 1.0 were towards specific techniques for keyboard interactivity within HTML so there was talk about tab index and access keys and lots of other techniques, those are essentially all techniques for keyboard accessibility that apply to everything, those issues aren't exclusive to HTML so what has happened now is the guidelines have been re written to be more technology-agnostic and they would apply to everything so the guidelines now say things more like a mechanism needs to exist to be able to effectively navigate with the keyboard they don't necessarily go and say, use access keys, use tab index, provide skip links, so it's actually been, a little bit, in my mind anyway, quite liberating in that we're seeing that accessibility is not just about HTML it's about how we interact with whatever piece of technology and that in my mind is the most satisfying part of WCAG2.

Mike: Right... one of the things we try to do with our clients is to point them in the direction of not evaluating a website but evaluating the customer experience, evaluating the task performance, setting some targets and metrics and I think from what you are saying that the standards are moving in that direction too, in other words they are saying things like, for a particular task, someone using different kinds of assistive technologies must be able to complete that task successfully and effectively.

Derek: Exactly, and it's wonderful, I think what we are seeing now is, in the past we used to see people relying on the check-list, and saying this is what we need to do in order to make our websites accessible and I think what's happening now is people are looking and seeing, we've got this set of guidelines and a check-list to help us, and compliance with that is important but just as important in terms of meeting the guidelines of the check-list, is the actual performance itself and that's one thing that is absolutely critical is not just are we meeting these check-points but can people perform the tasks that they need to get to complete?

Mike: I think a great side effect of that is that you cannot know that without involving those people in your design and development process.

Derek: Exactly, it is wonderful because it really leads to... it leads people down a path that this is about the people that we are actually trying to engage with on our sites; it's not just about the check-list and I think what has happened over time is that people are realizing now that the check-list is simply an artifact of years and years of experience with actual people and so I think that the check-list is the starting point but the people are the end point, and that's the beauty of it now. I think we're starting to see the intermingling of the two where we are seeing that end-user experience. If we can't test with everybody, or people with all different types of accessibility

needs, we've still got this check-list and guidelines to help us provide an experience for everyone, but we still want to do as much as we can with real people.

Mike: So you've talked about WCAG2, when is that likely to become released?

Derek: That's a very, very good question. I would hesitate to even guess, although, and this is no, I'm not sure who is to blame for this or if there is any real need to blame, but what keeps happening is that people are becoming really passionate about it and voicing their concerns with what's in the current version of the guidelines so we actually went to, there was a last call for comments and there was so much feedback that came in regarding the guidelines that they had to, they didn't go back to the drawing board but they had to re write some things significantly.

So there's a continued cycle of revision so for any of us to say, I think we've been saying for a few years now, and when I say we, I mean those of us in the accessibility, I'm not necessarily involved with WCAG 2, and whether or not it comes out in a spec. form at any point soon but we've been saying for a while now "Oh, sometime next year" and I think we've been saying that for a couple of years now. So I am hesitant to say but I'm feeling good that it will happen, sometime within hopefully the first portion of 2009.

Mike: Real soon now... I know that there's also a separate group working on rich internet applications, is this part of the issue or is that likely to become more important to people building applications like interactive mapping and so on?

Derek: A separate group from the WC3 you mean?

Mike: I'm thinking of the WAI-ARIA

Derek: Right. The WAI-ARIA group is closely tied to everything else that is going on in terms of WCAG, so I would say it's well coordinated, I think part of the problem now is that we're kind of dealing with un-charted territory trying to codify some of the stuff that we've just never had to deal with before, and so what's happening in WAI-ARIA right now is that there is an evolution of another spec that basically helps us specify in our code what a web application should do because we simply don't have all the tools in HTML that we need and so we put off and come up with custom solutions and so WAI-ARIA is essentially a way for us to create the kind of interaction that we would have at the operating system level with a web page so if we put a tree into a web page or into a web application that tree will actually be recognized as a tree by the assistive technology.

So there is, one thing I will say is the WAI-ARIA stuff that's happening is separate from WCAG as a whole so I am not sure that it is really part of the reason that things are slow but I can certainly say that one of the reasons that we're finding things slow going right now is because it's new, even though WAI-ARIA has been around for about three years that people have been working on it, but the support in screen readers, browsers and other assistive technologies, developing test cases, that's a lot of work, to deal with all the different possible scenarios because we are basically recreating operating system level functionality within the web so there is a lot of work that needs to be done there, something as simple as writing a test case, it may seem fairly trivial but there's actually a significant time of programming work that needs to go

into it at all levels, from the person that's creating the test case and showing the examples on the web to the people that are building that support into their browsers and to the people that are hooking into that from the operating system level to be able to work with the assistive technologies so there is a tremendous amount of work that needs to be done there.

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...mapping is a really interesting area because it's one of the first, I think, that's really pushing a lot of these accessibility issues and interaction. So I know you have been working with Google and using Google maps, can you tell me about some of the accessibility issues of interactive mapping that you've been dealing with and just how you have been tackling those?

Derek: Sure, there is actually quite a few different issues and one of them goes back to what I mentioned before in terms of simple things just like the controls. There's significant JavaScript that's being used to power any of the maps and it doesn't really matter whether it's Google maps or, we see the same issue with Mapquest or Microsoft maps, anybody that's got some mapping technology right now seem to be doing very similar things. The controls for one part are something that are just not accessible by default and so what we've been doing is working with creating alternatives so that whenever we do a custom map implementation we ensure we put in our own set of custom controls that allow people using a keyboard to have full access to zooming function, to panning functionality to be able to change their views, because it's not there by default.

Mike: It's not enough to have or to rely on the mouse keys for those functions?

Derek: No, well that's actually what we're doing, we're providing the ability to use the enter key and use the keyboard properly so what you'll find in most maps if you try to tab to the controls that are in there, the zooming and the panning controls, if you try to use the tab key to access those, you simply can't. So what we've been doing is replacing those controls with something you can tab to that's an intuitive control, you can use the tab key, you can use your keyboard to fully interact with.

That's been one of the big changes. The other thing we are working on right now is trying to help people understand what the context of the map is - you and I have talked about this before - there's a seemingly overwhelming problem with interactive mapping and accessibility and that is, there is just so much data that's there - how can we provide an alternative to everything that is visible in a map?

Mike: And what's in the map is really in the eyes of the beholder: someone who understands geography and soils will get something out of the map that I wouldn't.

Derek: Exactly, and that's one of the big things we are working on right now, is helping people to understand the map. There are, and I don't want to break it down in this very, it's a very simplistic view, but in some cases there's the map for the map's sake, and in other cases there's the map for a particular application. So what we are particularly focused on is looking at a map and what its particular use case is in a scenario and trying to help people understand that it's not just the map itself, when the map is being used in a particular application, there's a reason for it,

so that map will tell you things, or you want that map to tell you things, and that's the alternative that we need to get across.

A very simple example is, when you are looking with Google maps and you're getting driving directions, they always do a really good job of, you have your route that is mapped out on the map, but they do an excellent job of providing an alternative which is the step by step driving directions, so they've done a really good job there providing an alternative to that particular use case for the map. So what we're helping people with right now is defining what the use cases are for their maps and trying to make sure that we're providing an alternative that satisfies that use case. That maybe an alternative that's built into the map itself or it may be some alternative representation that's outside of the map.

Mike: Right, so the alternative representations are sometimes the key to getting the task completed. Not using the map with some accessible means but actually taking a different approach to getting to the data?

Derek: Exactly, in some cases it may be that we need something outside the map to help complete a task and in some cases it may be that it's simply something where we want to do it within the map itself so that there is an accessible means within the map to complete the task, it really does depend on the task that we're trying to complete, whether we're trying to map out a route or see a particular overlay of data or some combination of the two, it really depends on what we are trying to accomplish and so the means that we choose or suggest to implement really depend on that end use case.

Mike: Right, so the whole thing really centres around what are the use cases, what are the insights people get from the map or from the data, it's not about looking at the map itself and trying to make it accessible in some way.

Derek: Exactly, there are certain things that we do need to do at that level in terms of making the map accessible itself, but for the most part what we are really after is that end use case. What are the insights, what are the tasks, what are we trying to actually complete, what tasks are we trying to compete with this map?

Mike: OK, so I guess we've nearly finished, talked a bit about the current state of standards and development and where things are going, but I know you have a passion and a vision about where you think this should be going, how we should be thinking about providing an experience, a universal experience I guess. You showed some pretty cool sites in your recent talk, I wonder if you could tell us just a bit about how we should be thinking about accessibility in the big picture.

Derek: Sure, I continually come back to these applications that are... there's a lot of work being done in terms of data visualization right now and what I'm really, really hoping for and am passionate about, we're actually working on an application right now that tries to embrace this, is that it's not just about data visualization, it's about providing ways in which people can actually interact with and experience that data.

So in an application we're working on we're working on providing an experience that helps people understand what the data is about. We're working on something now with heart rate data

as it relates to athletic competitions, so we'll be measuring heart rate data and our GPS coordinates and speed and altitude and all these other factors that we are measuring. You know we could simply provide something that gives a textual based, a text based representation of heart rate at a given time and that would be something that would be accessible to a screen reader by saying the heart rate at such and such a point in time was 165 beats per minute, but what we're trying to work on is trying to figure out how can we make that concept of 165 beats per minute more universal, so how does that impact somebody that can see but has never experienced their heart rate at 165 beats per minute before? How do we make these things available to everyone?

So we are working on a component of this application right now that takes the heart rate data and not only does it provide the text base representation, we're taking that text and making it nice and large so that someone that's got low vision can see and we're adding in audio that will have a heart beating at 165 beats per minute at the same time. We'll also show the heart visually pulsing at 165 beats per minute because what we are really trying to do is create an experience for people so that regardless of their abilities they have a bit better understanding of what 165 beats per minute or 180 beats per minute actually is.

So we are trying to approach things from that perspective, not what's the alternative for somebody that can't see and is using a screen reader but what is something that will provide an engaging experience for everyone, for somebody that, and we're not even talking about somebody that can't see, what about people that are auditory learners? They are fully sighted but what if they are an auditory learner and they really prefer to hear things. We're trying to take things in that perspective and to look at that overall experience that is as accessible as possible and understandable as possible to everybody regardless of their, whatever faculties they may have.

Mike: Yeah, and that takes it way beyond accessibility. Wearing my other hat outside of this life I teach music and I know that people do learn in different ways, some learn by instruction, some learn from text, some learn by observation, some learn by feel, some are more visually dominant, some are auditory dominant, so it's great to hear that because it really ties it all together, it is beyond just the immediate interaction, the sensory perception and it's about helping meet people's learning styles and preferences by providing this experience in multiple channels, I guess.

Derek: Exactly and I think that's why, you know, personally I see so much good happening in the web right now in terms of it being a more engaging experience, I mean, the web did just start out as just text and it was reasonably effective but quite boring and now we're in a scenario where one of the examples I used the other day was the data visualization of the Radio Head song where the video is playing and it's all created from data points so there's data there to be represented but the actual interaction with that on the web is, I mean it's magnificent to see Tom York singing this Radio Head song when it's not actually him, but it's in an application showing the movement of his face and plotting everything. I think there's so much to be done there that really helps this digital and physical divide that we have, that is bringing things so much closer together, I think of how much can be done for people with disabilities with all different modes of learning, or however you want to look at it there is so much being done to create those

experiences that are meaningful to people. It's really quite fascinating right now, it's a good time to be very excited about what's happening in the web.

Mike: So, for people who want to keep track of the new developments in accessibility, are there particular people and places - besides yourself - they should be tracking and following that you would recommend?

Derek: Sure, I certainly wouldn't say specific people, I mean there is a group of us, of accessibility people that are really trying to push things on the edge here and a lot of the stuff that you will see, for my money one of the best resources out there is still Accessify.com which is a tremendous clearing house of sort of the latest and greatest in terms of accessibility and what's going on. If it's an accessibility related issue it is usually found on Accessify which was started by a gentleman by the name of Ian Lloyd over in the UK and it's a great resource, it continues to have interesting tools, tidbits and opinions. There's also things, I'm associated with the web standards project and so there's things happening in the world of accessibility, you'll find things quite often discussed on the web standards project as well, so those are a couple of resources, and there are a number of other accessibility related blogs that are fairly interesting and keep up to date with this type of thing.

Mike: Right, well thank you for taking the time out today... [Fade...]