

DR. SWIERENGA: Well, I'd like to reconvene here. Oh, very loud. I'd like to reconvene and start our afternoon program. I would like to introduce some people and thank our sponsors.

First of all, I'd like to introduce the members of the Usability and Accessibility team, and also for the larger university program, University Outreach and Engagement. There's been a lot of effort to put this event on today and I want to make sure they're recognized.

I'd like to introduce Mike Elledge. Please stand wherever you are. I hope you're here. All right, we might wait on Mike. Actually, it looks like they're pointing to him in the back. He's a valuable member of our team. He's the assistant director. He's responsible for business development and client development, project management, and he does the work as well. There's Mike in the back there. He also is the chair for the CICIT Accessibility Group. The CIC is basically the Big 10 universities plus the University of Chicago. And he is very active in community source course management systems. So I want to make sure I recognize Mike.

JoDee Fortino, who loves this part. She's waving her hand in the very back corner. There she is. She's the center's business and lab manager, and she keeps everything going. We wouldn't be able to function without her. Appreciate all of her

efforts. She does an excellent job of keeping us up and running.

I'd also like to recognize our graduate students, Haley Roberts, and Ji Eun Sung, if they're hopefully still here. Sometimes they have class. They are back there. They've already been thrown into lots of projects and have deliverables produced in the couple of months they've been with us.

Graham Pierce, who is also there. He's joined our staff for this year and we're grateful to have him. He's also jumped right in and has been helping us work on the projects we've got going on.

I'd also like to introduce and acknowledge Constantinos Coursaris. He just flew in from Dubai an hour ago, MSU Dubai, which had its grand opening yesterday. So he's just arrived, so if you have any questions about that, he's your guy. But he's appointed to the Usability and Accessibility Center for part of this time. He's also assistant professor at the Department of Telecommunication Information Studies and Media -- TISM, as its known here at MSU. He and I have done several research projects together already.

Finally, I would like to thank Tina Houghton and JoDee Fortino. They co-chaired this event, all of the logistics and coordinating all of the rest of the Communication and Information Technology team, who put this all together.

So a round of applause for everyone.

(Applause)

DR. SWIERENGA: I'm also thankful to Mike for - he's shortening his presentation by the minute, but we'll let you go a little bit longer. I'd like to also make sure to acknowledge the other key component of putting on an event like this, and that is our sponsors. Last year we changed our sponsor structure a bit and we established different levels of support. TechSmith Company here locally in the mid-Michigan area has come in as a platinum sponsor, and several members are here. They gave a workshop. A few of the members gave a workshop this morning, and they have a booth out in the lobby. They just wanted me to mention that Morae-3, they're using all of this testing software, has come out recently, and you can get demos of it at the table. But they have been a fantastic collaborator with us at the Center. We use the Morae software at the Center and they help us make it work with the various kinds of assisted technology. They've been a very responsive organization and a wonderful partner.

The other partner that we're gratefully and sincerely appreciative of is MSU's Libraries, Computing and Technology, also a platinum sponsor of today's event. This organization we work with on a variety of fronts. They're heavily involved with the new MSU policy on accessibility that just went into place a

few months back, and a strong advocate of accessibility and usability in all of the core products for, and services, and Web sites, and Web apps., across Michigan State University. So, I'd like to thank those two specifically for being platinum sponsors. TechSmith, this was their first year, and Libraries, Computing and Technology is the second. So a round of applause to all of them who are here today. Thank you.

(Applause)

DR. SWIERENGA: And then, you know, it takes many hands, many organizations to get the job done. We had several bronze level corporate sponsors this year as well. CATA, the Capital Area Transportation Authority, and we have a speaker this afternoon actually from that organization. We're representing a project working with that organization. Dean Transportation and Dean Trailways. They were the bus that took us back and forth to the Center, if you went on the tour. And Website Optimization. Andy King is right in the back of the room. He just came out with a new book, so I encourage you to take a look at that during the break.

We also had several MSU organizations; first and foremost, of course, I have to mention University Outreach and Engagement, which is the Center's home as well. The College of Communication Arts and Sciences, and within that, additionally the Department of Telecommunications, Information Studies, and

Media. MATRIX, which is the Center For Humane Arts, Letters, and Social Sciences online. The Resource Center For Persons With Disabilities; Mike Hudson, the director, is here today. And we'd like to thank the sign language interpreters, Jana Bennett and Leslie Pertz, for signing this afternoon during the presentations. And finally, the WIDE Center, The Writing and Digital Environments, where one of my grad students is from. Haley is out of the Writing, Rhetoric, and American Cultures Department.

So, we have fantastic support, both from MSU and from businesses around here, and I'd like to give every one of the sponsors a very warm thank you.

(Applause)

DR. SWIERENGA: And now briefly I'd like to introduce the real Mike, Mike Paciello. Yeah, sometimes - that's the first time it's happened, but there's a first time for everything. But Ken is very gracious.

Mike Paciello, he's the founder of the Paciello Group. He's been working as an advocate for accessibility for over 20 years. He founded this probably longer than that. But he founded the Paciello Group over 20 years ago. He still serves as the president. He's an international leader, technologist, and lecturer in the areas of assisted technology, usability, accessible interface design. He really has worked tirelessly on

national and international standards and policy and any other kind of voice that he can get on behalf of people with disabilities and getting that into the design process to make products better for everyone. He's the author of the first real book that I read on Web accessibility and usability. It's called Web Accessibility For People With Disabilities. Back in 2001 was when I came on board, I think it was published right around then, maybe a little bit before that. So an early pioneer in the field. He recently was appointed co-chair of the Federal Access Board Telecommunications and Electronic and Information Technology Advisory Committee, also known as TITAC. He co-chaired this. I tell you, this was a very large effort, the re-writing the standards for Section 508, which is the major United States legislation on accessibility. Mike and Tim Kregan co-chaired this committee, which was no small task. You had advocates from business. You had government agencies. You had - he can even explain what else was involved. I was honored to be an alternate member for the Usability Professionals Association with Whitney Quesenbery, but Mike was at the head of that committee, and that has gone now to the access board for their review. He also was one of the key contributors to the design of the Usability and Accessibility Center. He came and consulted and helped the University Outreach and Engagement figure out how this Center should be designed, how it should be

set up, and he also presented at the first conference at the opening of the Center. So, Mike, thank you very much for being here. I know you're extremely busy and we're appreciative that you're willing to come and just talk to us a little bit about accessibility and trends that you see coming up.

Thank you very much.

MR. PACIELLO: Thanks very much, Sarah for - bios. are such a waste of time, not bio breaks, I'm talking about biographies. But speaking of bio breaks, be very careful. If you're of the male persuasion, having one of these things hooked up to you and walking into a urinal. There's some complexities involved with the design of these systems and those urinals that don't quite match up with my pants. So you have to be careful with that. All right. That's all right. That makes for a little bit of humor. So let's see here.

So before I get started, I wanted to add a little bit to something that Sarah said. You should know, and frankly for those of you who are here representing Michigan State University, that the MSU Usability and Accessibility Center is the only one of its kind. It's the only one of its kind. Now, there are centers that kind of preach and teach a little bit about accessibility, but it is the only one at the university level of its kind, and it holds that unique standing, as I hold personally as having been involved in it, as very precious,

something we're trying to promote and promulgate throughout the world at a number of different areas, but frankly speaking, this is it. So it is a very special, very special place, where an awful lot can take place and happen, particularly on behalf of accessibility. So, where that is my real soap box, so to speak, the area of accessibility and people with disabilities around emerging technologies I would really encourage everyone here to be very closely attached to the Center and do what you can to support, between studies, research, and development, and certainly from the standpoint of a product and business support. It's a very valued area.

When Mike and Sarah first asked me to speak, which was an honor for me to come back here, I had to do like I often have to do which is come up with something new to talk about, so to speak, and I spend most of my time now on the road, speaking, evangelizing really around this whole concept of emerging technologies, particularly true as a result of TITAC, and I'll talk a little bit more about TITAC as we go on. But I had basically gone through about half of not seeing Nassim Taleb's book on the Black Swan, trying to see if there was anything there that I could use, and in fact, while I'm not planning on spending any time, the notion of the law of probability and statistical analysis, or anything along that line, there were some pearls there that I felt were very compelling, especially

as I started to go back in time and look at accessibility and look at what we've done over the years, particularly over the last quarter of a century where I've really spent most of my time. And I'm starting to at least get a sense or a feeling that we have, those of us in the accessibility area, been involved in Black Swans, so to speak, maybe babies kind of going along with the mother, the mother, so to speak, and I have a feeling, a very strong feeling, that we are headed to another emergent event where accessibility will be closely aligned, in fact, may really be the promoter, if not at least from a protagonistic standpoint, the flame thrower for the next Black Swan. So we'll see what that means. Mike said, well, I'm not sure what you mean when you say Black Swan, so we'll talk about it. For those of you that have read the book and understand the theory, we'll see how that plays in.

The first thing I want to talk about are the three waves of accessibility. The theme of this is the third wave of accessibility, but from my perspective there are, or have been essentially three waves of accessibility. The first wave is the one that probably many of us are aware of, and that would be the assistive notion of accessibility, where it tends to be more individualized and personalized in hardware, if you will. Focused individuals were given prosthetics, fitted with prosthetics, individuals have wheelchairs, they have canes,

hearing aides, and the very nature of accessibility was more along the line of being assistive in nature, helping a person get from one place to another, so to speak, or perhaps enhancing their senses a little bit more, and it became an adjunct adaptive is another term that we tend to use in this field, as far as a literal wave of technology, if you will. The technology is relatively simple. Back then in the early stages of developing wheelchairs, we're just talking about wheels and something to push in a chair. It literally was of that notion. And we got a little more advanced as we started to get into technologies involving amplified sound through hearing aides. So that's what I see and know to be the first wave of accessibility. Now, over the last, oh, I guess, 30 to 40 years, really, we started to, as technology itself has kind of moved ahead and we've kind of changed from or shifted from a hardware sort of life, we're now living in a software or most people would argue, well, we really live in an information-based world, we see another generation or another wave of technology. And actually, again, that kind of started really from a hardware perspective, but over the last 25 years it's gone from being hardware, the first stream leaders, for example, were actually hardware devices. Things like the DECTalk were devised that actually spoke in languages, spoke things on the screen, and were used as devices like that that were more hardware focused.

The first screen magnifiers that came out were literal magnifying glasses, if you will, over the screens. So they were hardware focused. But in the last 25 years we've moved from hardware to software. So these are things that not only are off-the-shelf products, which again was part of this wave, but now most operating systems have these notions of accessibility built into them. So if you install Windows, whether it's Vista, XP Windows, all the way back to 3.1, there were some notions of accessibility software packages that actually were included as part of the operating system. The same thing is true with several Lenox operating environments, certainly true in the Mac OS. So you've moved into a second paradigm, so to speak, if you will, of accessibility or a second wave where things are very software-focused. They're a little bit more usable. They're a little bit more adaptable to the user, and a little more flexible, a little bit more high-tech-like. But, there still are a number of different problems. Ken talked about some of the very simple problems of individuals who are blind and low-vision users, for example, interacting with some of the state IT systems. I would imagine that some of the work that Sarah and Michael have done with some of their colleagues on some of the government systems, if you look back at some of the posters back here, you'll see that they are some of the government systems that are out there and some of the challenges for various users

with disabilities. So my feeling is that we will move to the next wave, or this third wave, if you will, and that it will be of a nature that is much more pervasive, that is, that it will have a start and it will spread like wildfire. There perhaps are some things that we'll talk about that will appear like they are exactly taking on that kind of growth spectrum, if you will. And they will certainly be ubiquitous, that is, that they will be available to anyone, anywhere, at any time, regardless of ability.

In fact, I recall one of the very first conversations that I had about this notion of ubiquitous, anywhere, anytime accessibility went back actually to some conversations that I was having with Murray Maloney, Yuri Rubinski, Tim Berners, Marc Anderson, Joseph Hardin, Chris Wilson, and some of those names probably will pique a little bit of interest because those are the very earliest days of the Web. In fact, this is when the first development work was being done on the Mosaic Browser. Those guys were all students, well, Joseph was - of course, Mike, you worked with Joseph up at U-Mich, right - they were all students then, so that gives you a little bit of perspective of how old I really am because we're going back almost 20 years ago. But back then we were already talking about Web accessibility from the perspective of, imagine if we had a network of servers and users could just log in and

through some personalization, Cookie, if you will - we didn't call it a Cookie - but some personalization notion, the system would recognize that these individuals were low-vision, had certain cognition disabilities, were blind or had certain hearing disabilities, and the system would immediately ship a service, it would pull together both the data and the content that they were looking for or interacting with, or the service of the application, and the assistive technology, and things would just work. And that's what - so this goes all the way back to 1993, yeah, 1993. So almost 15 years ago - exactly 15 years ago from today we were talking about things then. So we're not really there yet. But I do believe that is where the next wave of accessibility will exist.

So the problem then, or the challenge for those of us, again, in the accessibility world - and frankly speaking, for those of you in the technology fields will be the gap that exists between the first - I'm sorry, the first and second. It's really the second and third waves. And that is something that we call the ITAT accessibility gap. Now, those of us in the accessibility field have always known that this gap exists. And to put it in its simplest form is, IT or ICT, as the more popular international expression is, is Information and Communication, and Technology, and emerging technology is going whosh, like this, right, so it's beyond Internet speed. And AT,

or Assistive Technology, or Accessible Technology is kind of bumping along, but there always seems to be a gap of somewhere between five and seven or eight years before the accessible technology actually catches up to the information technology, however it's developed. Now, this problem is further enhanced by something that we all know is going on, the aging population, because more and more individuals, particularly as the result of the baby boomer generation, are using things, metaphors, if not actual technologies, for assistive technology or accessible technology for people with disabilities use. One of the first things that the folks at Fidelity and Tom Tullis and his group recognize as they were interacting with their client base was that a lot of their folks that were involved in financial services and investors were individuals that were getting older and, guess what, using fixed fonts, you know, that were four-point or six-point, weren't going to work, that they needed to adapt their webs so that the font sizes were flexible, it could be increased, etcetera, and so forth. So we're seeing a lot more of that kind of thing happening as a result of the aging population. It's gotten so popular that the Worldwide Web Consortium has now created its own new working group and office within the Web Accessibility Initiative to start dealing with some of the things that are going on with aging. So, demographics are contributing to this gap that is there, and the

gap is widening because IT is proceeding at a pace that AT, so to speak, can't keep up with. This was something, as I said earlier, we in this field, those of us in this field, have always known is happening, but it really, really came to a head with TITAC, with this special committee that was formed by the United States Access Board to start addressing technology standards for people with disabilities, procurement standards. It really exposed that gap in a lot of new ways.

Now, before I start talking about this, which probably is overwhelming just looking at it, but, you know, when its really nice and big, enlarged text, this, perhaps, as I was talking to Sarah earlier, is one of the best talking pieces I've ever had in my life. I can give - because I get so many requests to talk about TITAC and the work that we're doing at 508 in technology, this has made my life so much easier because I can - everything I can do I can break down into parts and talk from it. But Sarah's team built it. So I've tweaked it, I've changed some things. There were some data points in there that needed to be adjusted. I wanted to enhance some of the themes and, you know, make some very small adjustments. But for those of you that have any concept - or, let me ask that. How many of you here know what Section 508 is? Look at that. This is awesome. That's great. The largest group of people, I think, collectively that I've had where that many folks, I'd say a good

75 or 80 percent of you, know what Section 508 is. Okay, so if you know what Section 508 is, let's see how good you really are. If you - what's the paragraph, the sub-paragraph, subsection, dealing with what accessibility? It's a number, it's a numeric, 1194. --- 22. Good, excellent. Very good. That's great. There are about 15 or 16 requirements there, right? And software requirements are .21. This is what you're dealing with today. We've gone from about 40 requirements in Section 508. TITAC is created, I think we ended up around 97 or 98. So it's almost doubled. Now, for the groaners out there, we also did an incredible amount of changing around how we look at technology, ICT technology. I'm going to come back to this slide toward the end of my presentation so I can explain things a little bit more, especially for those of you that have questions. But what I really wanted to bring out here or emphasize here is, it was this group of people, 41 organizations, who, before we started, I think, most of them were friends. About two years later when we were finished, there were clear divisions, and this group not only was made up of different constituencies, i.e. business, government, individuals with disabilities, and professionals that worked in that area, but for the first time ever in the history of the U.S. government, a committee was formed, an advisory committee was formed where we had international participation. So the EU(European Union) was represented,

Canada was represented, Australia was represented, and the Pan-Pacific area of Asia, with specific representation from Japan, were part of this committee; decision-makers, so to speak, as we were generating these new standards. The biggest problem, if you will, the biggest issue that came out was that centerpiece up there under TITAC, interoperability. And that became and still is the number one issue. Easily stated, information technologies don't work well with assistive technologies. And anyone that's had any kind of accessibility testing will tell you that if they can get an application, whether its Web or stand-alone, or enterprise, I don't care what your platform is, to work for JAWS, they probably aren't going to be able to get it to work for Window Eyes, right, for screen readers, right? If you can get an application to work with various screen magnification applications, things are different there. There are just a whole Pandora's box, so to speak, of problems and issues that every time you kind of go in and think you've got it solved, it doesn't quite work. So interoperability really - and we would have, for the lack of the right word, discussions about this particular topic of interoperability for hours. This committee went on for two years. The best part of being on this committee was I chaired it because I had to remain neutral from all of the politics and the arguing that was going on. But I

also was a referee several times. So this is a huge, huge issue. So we'll come back to this a little bit later.

It also helped me to appreciate something else about the dilemma that myself and my co-chair, which, by the way, is Jim Tobias. Tim Creagen is the access for, liaison to TITAC. And Jim and I go back for at least 30 or 40 years. I will tell you that we got to this point where we felt like this issue of accessibility where interoperability between AT and IT took place was one that appeared hopeless, like we were never, ever going to solve that problem. And frankly speaking, if you look at the resulting guidelines or recommendations, you will still see a lot of questions around that one particular topic. However, as F. Scott Fitzgerald said, the ability for opposing lines to work is to take something that appears to be hopeless and hold that in one part of your mind while letting the emotional side of you be - that part that regulates what is, you know, determination to still move forward and try to solve these problems, rule the day, so to speak. That effect is really the ideal, which, I think, is where the whole concept of the potential of Black Swans really exists. Now, Taleb has, like I said earlier, a whole bunch of theories and ideas. I can't tell you whether or not, you know, on a personal basis, you know, how true they are. Some of them are stories, you know, you can take from it, if any of you have read his book, what you want.

However, what intrigued me was at least the notion and the discussion.

So, what is a Black Swan? Well, it's really something that is marked by three key attributes. First of all, it's an event-driven mechanism that is rare. It tends to be unexpected. It's, by its very definition, unpredicted. People don't predict these kind of events. And, in fact, for those people that try, visionaries and futurists and what not, who try to predict these events oftentimes they're wrong, and thus, it makes the very event itself, when it actually takes place, highly improbable. It just doesn't seem like it's going to happen. He cites two amongst many well-known examples that are a little bit closer to us. The 1987 market crash - where some of us are still thinking about the 2008 market crash - but it felt to me like we were kind of anticipating that a little bit more, so the probability is a little bit higher that it was going to happen. But all of the - his discussion points to the market crash of 1987 was completely unexpected and he contrasted that with the Great Depression and the market crash then where apparently that was expected, just by watching the time. So, this was this major, rare event. It had an extreme impact. It's quite pervasive, meaning a number of individuals or communities or population sectors are affected.

The other aspect of a Black Swan which I find

quite intriguing is that it's one of those things that you will, in retrospect, look at and say, ah, right, see, if we're really looking at all of these things, we would have been able to predict this event coming. So people tend to go back in time to find all the key attributes that led up to it. So, that's why he talks about the third piece of this being retrospective predictability. The spread of the Internet is another one. I have a tendency to believe it's not so much the spread of the Internet as it is the spread of the Worldwide Web, which lays on top of the Internet, so to speak. Most people that were using the Internet and when Vince Surf and some of the other folks, Postel and what not, were working down in DARPA, were working on and had been in government labs for, and university systems, for years before the Web came about in the early '90's. I certainly was using it when I was working as an engineer for the software company that I was working for back in the '70's and '80's. So it was there. It just didn't really get the kind of - it didn't have the kind of explosiveness that the Web added to it. So now, today, we look at the Web and the Internet as being quite pervasive. It's something we could have never predicted. If we just alone, listening to Ken's earlier talk, about that interaction that individuals have and the dependency that we have, even on state services, well, we start to realize that this is a big part of commodity, almost, in our lives.

Interestingly enough, I tend to think that there are Black Swan events, if you will, in the accessibility world, particularly ones that we don't even think about. For example, telephone, the invention of the telephone. When Bell invented the telephone, what was he trying to do? He was really trying to improve the ability to communicate with his sister, who was hearing impaired. So now we look at the telephone and, as time has gone by - of course now we use a mobile phone, cell phones and everything - but we're talking about something that exploded on the earth, so to speak, it's pervasive everywhere, so its impact was quite extreme, and when we look back, most people look back and say, well, here are all of the events that led up to him getting to that point, and the sciences and what not. So it appears that we have some examples of Black Swans in the accessibility field.

Another one are curb cuts. Now, I think most of you, since there are so many Section 508 savvy, I know you're curb cut savvy, right, and we start thinking about the pervasiveness and the impact of curb cuts. Well, why do they come up? Because of the Americans With Disabilities Act, right? Why were they designed and developed? So that individuals with mobility disabilities, particularly those in wheelchairs and what not, could get from one place to another. It's a little easier rather than having to bump over a curb, right? But who uses

them? Everyone. We all do. Just like the telephone. We all do. I tripped over a curb this morning because I avoided the curb cut. So that tells you what happens when you do that. So, again, this is why I hope you'll see, as I see, this concept of Black Swans is maybe not so foreign to our language, from an accessibility perspective.

So I believe that third wave accessibility, that is, the kind of accessibility experience such that it is pervasive and ubiquitous will emerge. Now, I'm going to talk about three areas for which I believe we will start to see these Black Swans. The key to all of this, by the way, is this line that I have here on the bottom. That Black Swans are positive things in our lives, so to speak, as humans, when we maximize our exposure to these different kinds of little events, if you will, little Black Swans, if you will. So there are three key areas right now that I believe are having a huge affect on information technology and emerging technology, as well as accessibility. If we follow them, if we start to watch the trends that are going on, this is why I believe we're headed towards a much bigger notion or third wave accessibility.

So the three areas as I have up here are standards, laws, and mandates. Emerging technologies, information technologies, in and of themselves, and, how quaint, transportation systems. So, World Usability Day, I had to get

that one in. But there's a lot more to it than you might imagine. So let me just talk about standards, laws, and mandates.

There are a number of standards and laws and mandates that are starting to literally come together. Over the last three to five years they've really been coming together. In the last year, year alone, we have seen almost the absolute, the finalization of the Worldwide Web's Web Content Accessibility Guides 2.0, or WCAG 2.0, for those of you that know it, okay? It's almost there. It's almost a final recommendation. Not quite, but almost there. We have seen the emergence of TITAC, okay, so TITAC, again, to just emphasize, is really the culmination of two standards, by the way, technology standards, which is why we call it Information and Communication Technology because the communication aspect of it, it involves another law called Section 255. So, today there are two major technology laws involving people with disabilities. Section 508, which is a procurement mandate for technology, and Section 255, which mandates telecommunications. Both of those have been brought together, so to speak, and that's what TITAC was chartered to do. So not only were we the largest group by almost double of any guidelines group that had been pulled together, but we were the first group that had two technology standards for disabilities, and we still had to do it in less than two years,

which is the standard time to pull all these things, which we pulled off, we did do it. So you have that.

You have the European Unions new procurement mandate. For those of you that are not as familiar with what's going on over there, it's called Mandate 376. This is a brand new procurement and it will mandate, like Section 508, the procurement and accessibility of technologies, ICT technologies. I'm working on that committee as well. We have three organizations, industry standards organizations, ANSI, ISO, HFES, who have also either released - well, actually both of them have now. ANSI/HFES just formalized and released and announced their new standard for accessibility, which is, I think, called ANSI 200, and ISO has their standard. So in the last two or three years we have seen the convergence of the standards, laws, and mandates that are enforcing, if you will, or creating at least a technical backdrop for which technologies can be enhanced and made accessible and usable by people with disabilities. And they are international in scope. Everyone is supported. Best part of them all, though? They're all harmonized. That is also a unique and new feature. Up until now, technology standards, as they related to people with disabilities, were disparate and separate all over the place. And now all of these are working together. In fact, M 376 is a compilation of ISO, ANSI, W3C, and TITAC. TITAC is a

compilation of ANSI, HFES, ISO, W3C, and then some other unique things that just came out of TITAC. So you're seeing total harmonization, which is a great thing from an industry perspective because it simply means that now I don't have to worry about where or what standards I'm going to - geographies, you know, are no longer an issue, I can work through these standards and the standards that I work towards and develop my products for will fit in under this genre. So that's that area.

Second is emerging technologies. We have things like Web 2.0, ARIA - well, Ajax, DHTML, those kind of technologies, dynamic, Web-based services, Web applications, that are flooding the networks, particularly the Web networks. We're talking about Web tops, not desktops anymore. And that's really what our world is becoming, you know, a big part of. All of the mobile technologies are making their way to that particular area. All of them now are being looked at, using these standards that are out there, complimented by some new initiatives around these very emerging technologies. Three of them that I have up here - first is the raising the floor initiative. This is an initiative that is being spearheaded by Jim Fruchterman and Gregg Vanderheiden from the University of Wisconsin, and basically that is all about building a pervasive and ubiquitous interface for people with disabilities on open source, in an

open source environment. That's another thing that all of these things have in parallel.

The ACTF initiative is an eclipse-based initiative. Again, open source, so there's another common denominator that we're seeing there, and it's about building tools, open source tools, to address some of these Web 2.0 technologies, to make them and enhance them. They're tools for developers and tools for users.

And then we have the fluid initiatives, which again, also is an open source based initiative around accessibility, but is primarily sourced out of the educational arena.

So, you've got these initiatives around those emerging technologies, combined with the W3C's accessible-rich Internet application group, and working there, working at the component level, so that the tool kits the developers are using can be properly attributed and interoperable with the assisted technologies. Emerging technologies are starting to see big advances for accessibility.

Now finally, transportation systems. So, I'll talk about these two on the bottom, lower right-hand corner of the slide, because as you go out here to the poster sessions, you're going to see studies in posters that actually have been built around some of these areas, particularly around personal GPS and wave finding, okay. Now, we have a notion of what wave finding

is, but if you ask a blind individual what wave finding is, well, it goes back to the days of this is literally the process of how an individual uses a cane to get around and navigate is a notion of wave finding. So, personal GPS systems in the transportation arena need to be enhanced for accessibility and a lot of considerations need to take place in order to ensure that GPS and wave finding is, in fact, usable and accessible to people with disabilities, and work is going on in that area.

Voice recognition and smart cards. Voice recognition is a technology that is starting to become part of our transportation, right, our car systems. Interestingly enough, people with disabilities have been using voice recognition applications for years and years and years, for decades, literally. And so what's happening? Our studies that are being conducted in research and development around voice recognition products are using learning both from a usability perspective, but particularly from the accessibility perspective, and data based on studies that have already taken place with individuals with disabilities. Smart card technologies like some of the new systems that have been developed, particularly outside of the U.S., interestingly enough, Hong Kong, London, and Australia have some very advanced systems. If you have last month's version of UX Magazine, in fact, these are three key areas that are discussed at length and in depth around smart card, voice

recognition, and personal GPS. Smart card technology scares me a little bit because it's very clear that this notion of this micro card that is basically a personalized computing system with RFID built into it and what not, but the use of them and what it requires, for example, a blind user or an individual who has dexterity problems, is going to be a big challenge. But there are studies that are going on. For example, some of the studies in Asia have resulted in putting strategic notches in those cards so a person who is blind, for example, understands which side the card should be used in order to use it in the scanning systems that are embedded in the transportation areas of smart card technology. So there are those studies that are contributing to accessibility. And then finally - and this goes back to the standards and laws and mandates area - in the U.S. we have a law called the Air Carrier Access Act. Now, this law mandates two key areas. Obviously, the airline industry, but also anyone who is doing business with the airline industry. So it really kind of takes in all of the online reservation systems and the hospitality industries. And it now has in it verbiage to say that because we are moving to a Web-based world, everything that is developed and designed on the technological aspect of the Air Carrier Access Act and complimentary to that field must be 508 compliant. So, here again, we're moving in that direction of advanced technologies, emerging technologies

which I think ultimately will lead us to this panacea, so to speak - I think panacea is probably a little bit of a reach - I don't think everything will be absolutely perfect for people with disabilities - but it's certainly getting us to a major event where I think things will really happen. I know I'm running close on my time here so I'll get a ---

So, all of those events, coupled with the five key themes that TITAC really emphasizes, I believe, will lead us to third wave accessibility and this next Black Swan. Number one, harmonization of all standards. The development of harmonized standards are key for the emergence of the technology that is usable and accessible to people with disabilities. Number two, everything that we create needs to be testable. That is a big problem in our industry right now and it's one of the reasons why interoperability is so difficult to achieve because the standards and the paths that we have created in the guidelines are not testable. The new ones we expect are. We designed them that way. Number three, everything has to be interoperable. So IT and AT need to work together like brother and sister - no, that's not a good one - work together in a sandbox, right, kids playing together in a sandbox. So that sounds good. Cognition disabilities is a huge arena. For the first time we've addressed that, and there are a number of different things that are going on to enhance technology for people with various

cognition disabilities. And then finally, the things that are most close to our heart is usability of that technology. Usability with the notion that it is usable by people with disabilities. It's my feeling that if we achieve these aspects of technology and accessibility we will achieve a third wave of accessibility and maybe, maybe a Black Swan event. Thank you.

(Applause)

So we have seven or eight minutes for questions? Till 2:00? Or do you want to come off? A couple of questions if there's anyone. Anyone, questions? Please, in the back. I'll repeat it if we can't hear it.

QUESTION FROM AUDIENCE: Not audible.

MR. PACIELLO: Yes, so in short - excuse me? Yeah, we're going to repeat the question. There seems to be a big difference, a big gap between the differences in technology with people with disabilities and people without disabilities and how they use that technology exists. So how are we going to close that gap?

QUESTION FROM AUDIENCE: Not audible.

MR. PACIELLO: It's not?

QUESTION FROM AUDIENCE: Not audible.

MR. PACIELLO: Right.

QUESTION FROM AUDIENCE: Not audible.

MR. PACIELLO: Um-hum.

QUESTION FROM AUDIENCE: Not audible.

MR. PACIELLO: So being a variation within the disability communities themselves. So a person with low vision isn't just a person with low vision. There are a number of different areas of low vision.

QUESTION FROM AUDIENCE: Not audible.

MR. PACIELLO: Sure, right, right. Okay, sorry. Thank you for clarifying that. That is perhaps the exact reason why I said I'm not sure that we'll ever achieve a panacea or a utopia here, experience for every individual with every disability. It's actually quite - it's a lot easier to deal with the blind because the randomness or the variety or the variance level is a lot smaller, as it is with the deaf and hard of hearing. Those things seem to be a little easier to address. But cognition and low vision seem to be a lot - there seems to be a lot of variance levels there. So whether or not we actually ever achieve true, one hundred percent accessibility, I will be honest with you and tell you we probably won't, at least not in our lifetime. However, I do believe that we'll be able to maximize a number of different areas of accessibility so that the user experience, which is something that really hasn't been addressed from an accessibility standpoint at all, is optimized so that increased accessibility but not optimal accessibility. So I do think we'll see that but we probably will never achieve

total, one hundred percent accessibility. That's never been a goal, by the way. So if I led you to believe that, that's not the case. We're just trying to do the best that we can to achieve a more accessible user experience.

Other questions? Okay. We're short on time so...

DR. SWIERENGA: Thank you very much.