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ASIA-PACIFIC REGIONAL INTERNET GOVERNANCE FORUM

NEW DELHI, INDIA

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TAPAS ROOM 2

WORKSHOP 5

TOWARDS AN ACCESSIBLE INTERNET FOR PEOPLE WITH DISABILITIES

PRINCIPLES AND ROADMAP FOR INTERNET GOVERNANCE

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>> Hello. Can you hear us?

Can you hear us?

Can you hear us?

(Echoing)

We cannot hear you very well.

Gunela, can you hear us at all?

(Echo)

Ladies and gentlemen, we apologize for the glitch. It might take a few more minutes to set it right. So please bear with us. We will start as soon as we can get Gunela to be heard over here.

>> GUNELA ASTBRINK: Okay. I think I can be heard. Can you confirm that please?

>> Yes. We can hear you better now.

(Echo)

>> SATISH BABU: Can you hear us now?

(Echo)

>> GUNELA ASTBRINK: I can hear you, but I hear a terrible echo.

>> SATISH BABU: Can you increase the volume?

(Echo)

>> Hello. (Echo)

>> GUNELA ASTBRINK: My volume is at maximum now.

>> Can you hear us now?

(Echo)

>> GUNELA ASTBRINK: I can hear you loudly and strongly. But with a lot of echo.

>> Yes.

(Echo)

Yes, so...

>> GUNELA ASTBRINK: I have now muted my speaker.

>> Right now --

(Echo)

>> Gunela, I hope you have a headset on.

>> SATISH BABU: So ladies and gentlemen, we will get started now. We don't have anymore time to lose on the connectivity.

I'd like to welcome all of you to this session, which is entitled towards an accessible Internet for People with Disabilities. The format of this particular workshop is as follows. We have four panelists with us today. The first is Gunela Astbrink, who is one of the organizers of this workshop. She is in Australia and she is trying to connect from there. As you can see, we have been having a little bit of problems in getting her connected.

So we are hoping that she will be able to come in.

In fact, she wanted to speak first, because she was kind of introducing the topic as a person who has been working for long with People with Disabilities.

The other speakers that are here with me today Arun, Dipendra, and Sunil who will be speaking to us on various aspects of working with People with Disabilities, in the context of an accessible Internet.

So we will first see if Gunela can join us, and make her statement in about five to eight minutes. If she is unable to join we will continue with the panel here.

So Gunela, are you able to hear us? Can you start?

(Echo)

>> GUNELA ASTBRINK: Okay. I will start.

And I'm just wondering if my slides can be loaded, please. Is that possible?

In case they can't be, and in the interest of time, I will start my presentation. And hopefully they can be loaded as we go along.

So thank you very much. And it's a real shame I can't be there in person. I was sincerely hoping to, but I'm delighted to be presenting at this APrIGF.

Am I -- I'm hoping that I'm on. Oh, great. I think...

Anyway, while this is uploading, I'm assuming that you can hear me. Yes, you can hear me fine.

In the background I'll see that I have something from Papua New Guinea. Anyway, this workshop came back after last year's APrIGF. The topic was covered at the International IGF but it may not be at the regional level. And so Satish and I are talked about organising this workshop. And I heard with interest at the opening address about the Internet. We are seeing the future in villages throughout India and it's really exciting and the thing is an equitable Internet. So certainly accessibility and disability are key components of an equitable Internet.

So when we talk about disability, we need to be clear on what we need. We're talking about people with blindness and hearing loss, and we will be hearing about that from Dipendra and people with hearing loss, and we will be hearing from Arun about deaf-blind issues:

And then of course people with physical disability. This is a key area for People with Disabilities. And we often think about it from the point of view of vision loss and hearing loss and physical disability. But intellectual disability needs to be taken into account here and there are particular issues when it comes to the use of the Internet and the benefit of the Internet for people with all of these different disabilities.

And when we look at the statistics of disabilities, according to the World Health Organisation, 2010 in their report, they are talking about 1 billion people.

(Audio fading in and out)

80 percent (inaudible)

Now, we look at disability in different ways. The medical model, I'm sure there is a lot that can be done medically. The first thing is (inaudible) and the other one is the social model, which means the community has to (Audio fading in and out)

(Inaudible) something that really is fixed in this process. An example is programmes for users. And the benefit for (Audio fading in and out)

Now an electronic programme, there are things like accessible websites and net, and we are hearing about that. Hardware and software, mobile phones can be designed in a way so that they are accessible right from the start and be accessible here. And we must not forget the role of technologies, where there are no solutions that might meet the needs.

So let's look at this. The United Nations Convention on the Rights of Persons with Disabilities, it's been signed and ratified by over 100 countries and a large number of those happen to be in the Asia-Pacific region. Now, there are a lot of different publications, and one of them which is very relevant here is implementing this to design, develop, produce and distribute accessible ICT at on easterly yes stage, so these become accessible at minimum cost for People with Disabilities. And we look at this and this accounts for the market.

And another promising area, the Internet is for everyone. Now, everyone should really meed everyone. The policy paper, which I was privileged to draft, called the Internet fews by Persons with Disabilities cover a lot of topics for disability and everyone being involved in improving accessibility to the Internet.

And most reseently, NETmundial had a landmark meeting. They produced the NETmundial multi-stakeholder statement of Sao Paulo, and there were a lot of very important supports from Governments. And one of those related to accessibility much and it States "Accessibility: Persons with Disabilities should enjoy full access to online resources. Promote the design, development, production and distribution of accessible information technologies and systems on the Internet."

So we have these simple statements coming out that relates to Internet Governance. So that really is a very, very brief overview. (Echoing)

I probably would have gone into a little bit more detail, but because of the time factor, I look forward to participating in the panel and hearing the other speakers.

Thank you very much.

>> SATISH BABU: Can we have the audio back to the original?

(No Audio)

>> ARUN MEHTA: -- is between the cracks. A lot of technology has been developed for persons with blindness, for persons with motor disabilities. But if you have multiple disabilities, then there is surprisingly little. And so we have tried -- decided to focus on this. I only mention this, we have done a lot of work relating to persons with cognitive disabilities and at previous meetings of the Internet Governance Forum I've had the privilege of talking about that. But if you go to our website, skid.org.in -- you're not able to find my slides? I have it on stick. It's uploading. Okay.

So we basically have set up a platform where it's very easy to develop fresh software based on individual requirements. You see, we believe that engineers sometimes need to work the way doctors do. That you're dealing with people one at a time, not that you develop a piece of software and expect a million people to be able to use it. So we created a platform where this was easy to do, where we could easily train students to do the same and that's how we're able to do free software in a country with very little support, because students work for us in summer vacations free.

What I would like to talk about here is about the work that we are doing with the deaf-blind. This is something that emanated from the Dynamic Coalition on accessibility and disability at the Internet Governance Forum where we started to ask ourselves who are the people who are not here? You know. We have deaf people as part of our DCAD. Blind people like Dipendra have been very active contributors. Wheelchair based people like Chadi have been active. But multiple disabilities we didn't see.

Fernando and I had a discussion, a blind person from Brazil, that the deaf-blind can be reached through the vibrate on the phone and I've got a student who started working on it. And we soon had software which used Morse code on the vibrate to communicate. But there wasn't a single deaf-blind person who was ready to start using it.

So we really needed to look at the problem a lot better, and so we were very fortunate in getting support from the ISIFD, Information Society innovation fund, which is administered by APNIC, and they are very, very agile and flexible when it comes to small sums of money. Very often an NGO like ours needs a small amount of money. So if you want a large amount of money there are plenty of funders you can go to. But if you want a small amount of money you have to go through the same rigmarole with them and it's not worth it. So this is designed for people like us, who are happy in the work that they do. But since they have a project that needs a lot more work than they anticipated, and the deaf-blind was something like that, we can develop software. What we cannot do go is go into the deaf-blind community and do workshops and that takes a lot of money and effort, and we were very happy for this help.

Now, what also made it -- if you can go to the -- I think we have gone too far on the slides. Just go back a little please. I've been writing software for many decades now. It's amazing how simple it has become to write simple apps. And I would like to simply demonstrate this. Now, we have actually, as part of the grant, the work that we have done, we have developed two apps. Both are available on Google play. The first one that I will talk about is something on my phone. This is designed for people, old people basically, who have low vision and are deaf. This is among old people, sadly.

So this is an app which basically... well, basically, what you have to do is you rotate the phone -- hello?

What is your name?

Can you read from wherever you are? So even a person with low vision can use this to communicate. And this -- I've been using this in English. You can also use this in Hindi.

Now, if you can just go to the next slide, please.

You don't have the graphics, but just the text. I'm sorry, you don't have the graphics. But on this graphic what you were supposed to be seeing is the source code for this app that I just showed you. And it's just like if you're doing Legos. It's like sticking four or five bricks together. So this is a very, very simple app. It gets written in less than five minutes. And what it is doing, it's doing sophisticated speech recognition and everything. But you as a programmer don't have to know how to do it. There are modules, like Lego bricks, that you plug in and you can start making your app.

I'm glad that you were able to demonstrate this to you on the phone and maybe I can show you the source code. If you wish you can talk to me later.

Can we go to the next slide, please? Now the latest app that we have done, what we have discovered, sadly, is that hardly any deaf-blind person in this country learns ABCD. To get to a point where you get basic literacy is huge for a deaf-blind person. So what we, you know, what -- deaf-blind person, for example, struggle with basic concepts such as mom and dad. I mean, imagine that the teachers have to spend a lot of explaining to the child what is mom, what is dad, and what the difference is.

Learning how to read time and to tell time takes a long time and things like that.

So our focus has been now, on writing apps that would work for preliterate persons, persons who have not yet learned how to read and write. And so the best place to start is with children. And when you're working with children, the natural thing when it comes to communication is a slate. Now, the normal slate that all of us grew up with is not accessible to a person who is blind. So the software that we wrote lets you draw with your finger and you can sense what you have drawn by vibration. I'll just -- I can just quickly show that to you. But the vibration is something sadly that I capital show you. But let me just try.

When you just run your finger over it, you can sense what you have drawn with your finger and the vibrate even if you are a deaf and blind person. Now this has just gone up on to the app store just a few days ago. In the course of this week we will be doing workshops at the Helen Keller Institute for The Deaf and Deaf-blind, with deaf-blind people, to see how well solutions like this work.

So what I wanted to do -- okay. Go to the next slide, please. We have a screen shot that you can't see but I've shown you the thing here live. So move to the next slide. Please.

All right. So now what basically -- and this is the key that you -- that I hope you will take with you from this talk. And that the -- and that is that the development of technology is not enough. Now, we kind of new that. But we are actually going through the painful process of figuring out exactly what it is that you need to do to introduce technology in a case like this. So we have written the software. We are going to be conducting workshops in Morse code. We will be providing the school with phones so that -- in order to conduct the workshops, and so on.

Now, so, really, I mean, there is a lot of effort that -- so writing the app is actually you might say the easy part. The tough part is really trying to see how to get that in.

So what we are -- so on the one hand at the Helen Keller Institute, we are able to target our intervention at a very, very strategic place. The Helen Keller Institute trains trainers of deaf-blind people and is one of the few people who does so. And we will be training one of the faculty at the institute, who is deaf-blind. And hoping that in this way the interventions that we are introducing will over a period of time make their way into the community. I hope, in the future meetings, that I'll be able to report a little bit on how we were able to take this forward.

Thank you very much.

>> SATISH BABU: Thank you, Arun.

(Applause)

>> SATISH BABU: For that excellent presentation on the different tools and technologies that are being developed today.

We will have a question and answer session towards the end of the session. So please hold your questions.

I'll move on now to Dipendra Manoha, the manager trustee of the action trust, and is the assistant project manager for the DAISY For All Project. He is the President of the DAISY Forum of India, and the President of the National Association for the Blind, Delhi state.

So we need two mixes here for this. One is this one and can you please turn on the other mic?

(Feedback)

>> DIPENDRA MANOCHA: Good evening, everybody. So today I'm going to talk to you about something that -- for which the DAISY consortium family came into existence, and which is the accessibility of the content. Accessibility of publications. Accessibility of documents for people who cannot read normal print. And people who cannot read normal print include people with blindness, low vision, illiterate, children with dyslexia, learning disabilities. People who cannot hold books because of the problems and disability of both the hands. They cannot hold a book. They are also persons with print disabilities. And temporary print disability also comes for people who are actually driving a car.

How do we access the book? The digital book, the book that comes on -- that can be read on your mobile devices, whether they are your mobile phones, tablets, computers, these publications are primarily the digital books.

This was the -- the digital book is the primary format which then can be distributed to the end-users as Braille, as audio, or as large print. Or, it can be actually read directly on a mobile device by persons with print disability.

So four different formats in which it can reach a person. And these are Braille, audio, large print, or the eText itself on a screen reader enabled mobile device. But the mother of all of these four formats is primarily the digital book itself.

We started using digital books almost two decades ago or maybe three decades ago. With the advent of iPads and iPhone and the tablets, the world, the rest of the world, so-called normal seeing persons, persons without print disabilities, also started using digital books. So we now had things like Kindle, iBooks, et cetera, which were the mainstream industry had started adopting the digital books.

The challenge now when we said was that earlier, earlier to the Kindle or the iBooks, we had to republish the books in digital format. Books would be released as a hard copy book on paper and organisations would need to convert these into digital format for making them accessible.

With the mainstream adopting the digital books, our task obviously our strategy changed, and we said why should we republish? Why cannot the universal design principle be adopted in the mainstream digital books?

And this is how the standards came into play, where all the knowledge that the blindness community had gathered together for making a digital book, accessible digital book, was transferred to the mainstream industry and it became the ePub books, the accessible ePub book was all the wisdom and knowledge created by the blindness community for the digital books being adopted by the mainstream industry.

So it was a DAISY consortium which primarily developed these standards, which are adopted by the International Digital Publishers Forum, IDPF, which is the body that has created the ePub standards for digital books.

So even if you buy a Kindle book, you might not see the ePub on it, but under the hood, in the background, even the Amazon would ask publishers to submit their books in ePub format so that they could be included in the Amazon bookstore.

Now, I'll just give you this thing that once this came into the mainstream industry, what changed for us?

(Computer screen reader talking)

However, he knew the U.S. Congress speech was a historic policy statement to an important audience. His listeners were the very Congressmen and women who would have to give their vote of approval to the nuclear deal that he was seeking to strike with --

>> DIPENDRA MANOCHA: So what you heard was the eTextbook that I was playing on my IUS device. And what I've done is gone on to the Amazon website and purchased this book and loaded it on my device and started reading it. This is no less a revolution for us. The day this technology became available, suddenly the number of books that I could read jumped from a few hundred to almost 1.8 million.

I mean, if you can just imagine the kind of ecstasy I must have gone through on that day.

That suddenly now I could, like everybody else, could simply go to a Web store, just buy a book and start reading it. It was such an amazing thing to happen, because before that we had to get hold of the book, republish it, convert it, spend maybe ten thousand Rupees on the conversion and then get a chance to read it. And this would happen to less than 1 percent of the published materials.

Now, the good things in this almost ends at some things, because when it comes to developing countries, I guess you can imagine that an IOS device is a luxury.

It's not something that everybody in developing countries, where 90 percent of persons with print disabilities reside, can actually afford such a device.

If I talk of an alternative of a smartphone it might be an  Android phone. But what happens if I shift to an  Android phone? And what happens when I shift from English to local language? Is this revolution still available if I make these two changes?

Shift to a low-cost smartphone, an Android phone, and shift from English to an Indian language? What happens to it? I just would like to demonstrate that.

(Demonstration)

Hold button to the right.

(Microphone feedback)

(Computer talking)

>> DIPENDRA MANOCHA: So we are seeing this change that the voice quality has gone down. It's hardly understandable. And this technology is working for Hindi but not for many more Indian languages. So the choice of languages on this becomes almost negligible. And the voice quality of the technology has gone down considerably. And for many languages for developing countries, even this basic technology of speech may not exist.

The challenge also is that when we shift to the Indian languages is that the font that is used is a nonstandard font in most publications. So if I go to a website of say any education board of the country, where they have put up the digital files of the books on the website for anybody to download, if it's in any Indian languages, 99 out of 100 times it would be published in a font which is a nonstandard Indian language fonts, which means my assistive technology would not be able to read this much what it was reading right now. The whole technology would fail.

And the format also would not be ePub. So unless -- what I'm actually saying is that there are two major key standards that need to be followed. And I would say that these are the two key words when it comes to creating content in a language, especially the content which is nonEnglish local language content. The first one is the format should be an ePub, an accessible ePub format, and the font should be compliant to Unicode. So these are key words for us, ePub and Unicode. Most of the public documents, publications, are currently not there right now. So there is a lot of work for us that if we want the content there on the Internet to be useful for Persons with Disabilities, these need to be adhering to these accessibility standards or mainstream standards, actually, which allow accessibility to be built into them.

And the third one is the gaps for some of our languages. Technology gaps. Such as having a good quality voice on all mobile devices. Or the Braille translation systems to be working on our devices. These need to be plugged in to provide us with the accessibility.

Thank you so much.

[Applause]

>> SATISH BABU: Thank you very much, Dipendra, for that presentation. We have learned a lot regarding the issues that are currently being faced.

Now, I imagine the frustration when you move into the Indian languages, because of the lack of standardization on some of these. The good news of course is that there is a lot of work now being done for standardization, and some of this technology gaps are now in the process of being filled.

So we hope that these efforts will bear fruit, maybe over the next two or three years, and that some of these pain points will be eased.

So we now move on to Sunil. I'm not going to introduce Sunil. He is well-known to all of you.

>> SUNIL ABRAHAM: Thanks, Satish. You heard from Dipendra Manoha about the book famine. It is estimated that if you are a visually impaired person in the developed world, then you may have access to, say, one or half percent of all the books that are available to those without that particular disability.

If you are a similar person in India or some other part of the developing world, then that percentage goes dramatically south and you'll be fortunate if you have access to .001 percent of all the books available to those who don't have print related disabilities.

If this forum is filled with fans of the multi-stakeholder model, and if this forum is filled with what I might call ITU betas, those who vehemently protested WCIT, the so-called ITU takeover of the Internet, then if you want to end the book famine you should call for the death of the World Intellectual Property Organization. After all, that is a multi-lateral forum and we don't want multi-lateralism. We should repeal all the global intellectual property treaties, which are hardly developed at this multi-lateral form. And once that is the case, once there is no more International copyright law, the global knowledge will be available to the disabled.

Of course, nobody is going to encourage me to continue with that line of argumentation, even the most fanatic fan of the multi-stakeholder model, even the most rabid critic will not want to disable the copyright law.

In India, when the copyright act was amended in 2012, we introduced a disability neutral and a works neutral exception to copyright. So it didn't matter what your disability was and it didn't matter what the copyrighted work was, whether it was software, music, a movie, book, et cetera, as long as you can demonstrate that your disability prevents you from fully enjoying that copyrighted work, you had a right under the law to make an accessible version of the work and use it yourself and also distribute it amongst similar disabled persons without asking permission from the rights holder or giving any royalty to the rights holder.

Of course, the WIPO is not as radical and as progressive as the Indian Government. They came up with the Marrakech Treaty. Very similar. It was almost as if Indian policy best practice was exported to the International multi-lateral fora and the Marrakech Treaty does roughly the same thing, but it's not disability and it's not works neutral. It only applies to books. It doesn't apply to any other copyrighted work and it only deals with the needs of the print disabled. Those are people with visual impairment and other similar or related impairments that prevent them from holding and turning the pages of physical or electronic books.

So the IGF movement, as Paul Wilson called it this morning, if it were truly concerned about the rights of the disabled, would work day and night extra hard in the implementation of a multi-lateral Treaty, the Marrakech Treaty, to ensure that the book famine is ended once and for all.

So that is what I would call upon this forum to take on as an immediate task.

Mr. Manocha of course is a very humble and unassuming man and he doesn't talk about all the wonderful things that he has done. So I will talk about one project where we have the privilege of working with Mr. Manocha. This is a project funded by Hunts Foundation. And we are working under his leadership, under Mr. Manocha's leadership, to build support for 162 Hindi languages in a free software TTS called eSpeak. And we are working extra hard to squash some bugs that are currently noticed on a free software screen reader called NVDA. NVDA of course won't work on a phone but eSpeak will and will be very useful in the Indian context.

Mr. Manocha spoke about another crisis, and this has to do with the lack of compliance with the Unicode standard that many documents unfortunately are still only available in font encoding. When it comes to Government websites, this is particularly important. And I have to congratulate the Indian Government again for having a national electronic accessibility policy.

But there are so many ways in which we get things wrong. If you go to the Department for Information Electronics Technology, and you try to access this very same policy document, the National Electronic Accessibility Policy, it's not accessible. Because the policy was born digital. Then it was printed, then the secretary signed and sealed the document, then it was scanned, converted into a PDF and uploaded on to the website.

So eGovernance which is the primary mode today for those who are disabled to access and participate in Government, to be full citizens, has many concerns when it comes to accessibility. The case study I gave of the inaccessible policy document is just one of the many challenges.

So apart from the software that Mr. Manocha alluded to, apart from the standards that he stressed upon, there are many other human challenges before our Information Society becomes fully welcoming to those with disabilities. Thank you.

(Applause)

>> SATISH BABU: Thank you, Sunil, for that presentation. These are many factors that get left out in the many discourses for the differently abled.

I'll spend a couple minutes on the experience that my organisation and my State of Kerala has had for computing for the differently abled.

We started our computing for the differently abled project about four years back. It's called insight and it's basically a free software, end-to-end stack for the visually impaired. Which means that you start at the bare machine, brand new, without anything on it, and you install and then you configure and then you get working. And the entire thing is enabled even for a blind person.

That has been kind of accepted by the Government and it's now being rolled out to the villages.

Now, since it is at least A customized heavily locally, because it's an open source platform, we have been able to make it do things that were not originally expected, that extension of course is very important.

We also have a number of other programmes that are being rolled out for disabled. For example, audio -- not book, but audio magazines, which are current affairs information that gets to them. The interesting thing is that many of these can, as Dipendra said, can be used by the sighted people of the it's not only exclusively for the blind people.

And I'd like to highlight the case of one blind programmer who has actually been developing a lot of software. He is based out of Bombay and named Krishna Kant. He is project leader of a team of programmers. And they have been designing and building software, particular software that is being used in India for financial accounting, called Grukata, which has been a big gap in the free software world, because of the monopoly of proprietary product in that space. And the free software community had no solution to that gap until this particular product from Krishna Kant came out. I can vouch for this because my organisation has been using this for the last three years for all financial accounting.

The interesting part is when I shared this information for the Government of Kerala, they said can this person design something for the Government? I said why not? So this last month the Government of Kerala has announced that it will go ahead with an extended version of this software for the Government purpose. And the point is that this is still being led by a blind programmer, although the member, most members of his team are sighted.

Now, there is also a lot of effort, yesterday I was speaking to someone from the Lenard International, an NGO working with the disabled as well. And their main focus is to equip the blind youth to get jobs in some of the sector, such as IT. Because IT is held in very high esteem in India. So they have been working on this. And they are looking for technologies that will enable quick training of this community, so that they can be kind of elevated to a level where they can take up these jobs.

So some things are being done, but there are still many gaps. And therefore it is -- it is kind of -- the onus is upon us as programmers, as developers, as leaders of these communities, to deliver, as Arun has been trying to from his side, develop technological tools, that there is a need for interventions and perhaps the Government needs to step in and support the interventions that are being carried out in Civil Society.

We will now open the floor to questions from the audience if there are any questions. And then we will have a one-minute wrap up for each of the panelists. I see that Gunela has gone offline but the other people are here.

So are there any other questions from the audience?

Yes, can we have a microphone, please?

>> AUDIENCE: Hello. I would like to know about any project that is going on for ICT intervention using sign languages.

>> DIPENDRA MANOCHA: Yes, there is an Indian sign language and there has been efforts for standardizing the Indian sign language. Although it's a challenge of what to call as an Indian sign language, because this is a language which is very deeply connected to the culture. So with some exceptions, there is something called an Indian sign language now.

But the use of ICT for making Indian sign language easier, there are tools that are being developed for learning Indian sign language. There is a dictionary. There is a CD, you can see a dictionary of sign language, which enables people to learn sign language.

There are a set of softwares for English, for example, for American Sign Language, et cetera, where it goes to the area of translation from audio to text or text to sign language or sign language to text, primarily.

These obviously are currently not available for languages in India. Indian sign language currently doesn't have such privilege to have such things, because a sign language translation software is something that is required, for example, if a student needs to be integrated into the mainstream classroom. The teacher would not know sign language. The student needs to know what the teacher is speaking. So these could come to the rescue, but unfortunately, it's not there. This is where we are.

>> AUDIENCE: I heard all the presentations, and in the Gunela presentation also she talked about the access to Internet, provided the communication employment and the participation to us, the People with Disabilities. And in our discussion what I find is we're talking really to know that there is lots of development happening. But what about the people who have the traditional knowledge system, but not more knowledge -- those who don't read and write also? And below the poverty level, also. How to access them with this system also.

As you give an example that IT level also, we are providing, but why not in the system, also, in other sectors, is there any progress? I want to know about this.

>> SATISH BABU: I think the Question is on documenting the indigenous practices and knowledge in a way that can be used by the differently abled. is that so?

>> ARUN MEHTA: What he is saying is how can ICTs get to people who are, A, poor, and, B, who are illiterate and who are basically only able to understand the spoken speech.

Well, as it happens, problems of persons with illiteracy are similar to the problems of persons with low vision and that is that you have difficulty with the printed text. So as books become accessible to blind people, they also become accessible to persons who are illiterate.

As far as, you know, cost and so on, you know, money is concerned, that problem is not going away. However, technology is becoming a lot cheaper. So the hardware at least is becoming increasingly affordable, even in villages you find people now increasingly with smartphones.

The problem of the software still remains. And that is where open source software, free open source software, has a major role to play in trying to reduce the overall cost of these technologies. The hardware is no longer the limiting factor. It is much more the software. And I think a lot of the discussion in the previous session was also related to that, and I'm sure that discussion isn't over yet. But perhaps that is a start.

>> SATISH BABU: So are there any other questions? Anything from the online participants?

Okay. For the people, we will have now one minute each and then Gunela. She is going to come on after the other people are over. She have will come on. Please be prepared. So for the summing up, I would like to start with Sunil. You have one or two minutes to sum up your thoughts.

>> SUNIL ABRAHAM: I think there are a range of other technologies which are also key, and it seems that in India and in many parts of the Asia-Pacific language compounds the accessibility challenge. The technology that we need are optical character transmission and Machine Translation. If only possible, we also need Speech-to-Text, not just text to speech. And given that we are a very proud people and we don't want to give up our scripts, we don't want to sacrifice our linguistic diversity, cracking the accessibility problem in this region is compounded by the linguistic diversity. So it truly makes things difficult. And since the private sector does not see a feasible market, it is up to the Government to invest large amounts of money to ensure that this critical infrastructure is available.

Thank you.

>> DIPENDRA MANOCHA: So just touching up on two points,

So then two points here. The first one, what our friend from Nepal said about the traditional knowledge, to be saved. And also the knowledge to reach out to people who cannot read print. Audio of course is a very powerful medium which we the blindness community has been using. And like with other digital text, we actually developed this technology to an extent which is extremely good for such kind of documentation and books or useful materials to be, first of all, created in an audio format in a structure and to listen to it. And we have a lot of open source tools and know how, how to actually capture and disseminate this knowledge to the target group that you are mentioning.

So I think that there is a big opportunity here of convergence of these two different diverse stakeholders to make use of this technology.

The second part, which I want to emphasize, is that when it comes to the accessible print productions, there is a technology gap or something. But there is a whole ecosystem that needs to be in place. And even if a single component of the ecosystem is not there in place, the whole infrastructure or whole system of accessible information falls apart. And this ecosystem actually relates to production, production of -- they would prefer that the mainstream production itself creates books which are born accessible. Otherwise, let's at least make it in a way so that it can be reproduced easily in an accessible format.

And the second component is the distribution network. How would it reach using the power of the Internet to the person or people in different or all parts of the countries, as remote as possible. But they should be able to get this content. And I feel the Internet and Internet technologies and softwares have a large role to play there.

And the third one being the equipment and the assistive technology in the hands of the end-user, which is compatible with the distribution system. And there, the smartphones and the apps and the text to speech systems, et cetera, have a big role to play. We need to make all of this work. Currently there are gaps. And due to those gaps, although we seem that we are almost there, but because there are certain gaps in the whole ecosystem, the system actually breaks. And the majority of the people have got very little access to the real information.

Thank you.

>> SATISH BABU: Thank you very much.

>> ARUN MEHTA: There are two aspects that I would like to react to. One is the whole question of how do we deal with the multiplicity of languages and so on, in terms of accessibility. What we haven't talked about on this panel is the improved -- is the improvements that we are starting to see in automatic translation. Just as with Speech-to-Text, the progress in the last few years has been quite dramatic. And today I am able to, without fear, just demonstrate speech to speak on a panel like this and be confident that it will work. I mean, this confidence I haven't had for more than a few months so far.

A few years ago, speech recognition was pathetic. You needed to train the systems. You really to -- really it was hard work. But now they recognize Indian accents ease yes and so on. Similarly, with automatic translation, those of you who are using these facilities on the Internet, may have noticed that it has become much easier now to carry on e-mail communications with people who speak completely different languages. And yes, there are times when there are different misunderstanding, but it works well. Again with Indian languages we don't have that much progress but it's only a matter of time.

And that brings me to the second point. And that is that as the Bible says, better than giving a person fish is to teach a person how to catch fish. One of the most rewarding experiences that I have had a as a teacher is when, under the guidance of Dipendra Manoha we ran a programme teaching visual basic to blind people. And that was, you know, the people who were part of that programme were extremely motivated. And I think they have gone on to do extremely well. But there are very few such developers, as was pointed out by Satish. People like Krishna Kant are rather and we need to see a lot more of them. That is the best way to have accessible softwares and technologies. But in your development team there should be disabled people. As I mentioned, software development has become really, really easy now.

In the west, there are huge movements to try and bring software writing literacy into the mainstream, particularly among women. And I believe that we need to extend that very, very forcefully into the community of Persons with Disabilities. That if they learn how to write software, first and foremost, the problem of accessible software will be reduced. The person will learn a very valuable skill. And the commitment of the person to that software will be for a lifetime. Because that software is something that is improving your own life. I mean as is the case with TV Roman Max speak. That is up to date because he uses it on a daily basis him sechl.

>> SATISH BABU: Can we go on to Gunela.

Yes, we can hear you. Please go ahead.

>> GUNELA ASTBRINK: Can you hear me?

Excellent. Okay. I think you can. So, I just want to say, look, I am delighted with all the knowledge that has been shared in this session from our panel of experts in disability and technology. And a couple of things I just wanted to raise. We heard about the ePub standard, and that really arose from the disability community, meeting a very important need for People with Disabilities and Dipendra talked about that in detail and how that has actually become a mainstream standard.

And he brought up only one example. But there are others. Where, for example, the scanner was originally a tool for blind people to be able to access material. And also, voice recognition works, and it's for people with physical disabilities and this has now become a mainstreamed product.

We heard from Sunil about what can the Internet community do to try and improve the WIPO reforms. So I'm just looking at lots of really interesting ideas that have come from this panel. We do not want to lose those. And I believe strongly that the Internet community can work with some of these particular issues. And certainly and maybe we can look at setting up a regional theme for promoting and training of young People with Disabilities in software development with programmes like that already happening in India. When we do these on a broader scale.

And so I raise that challenge here at the APrIGF to see how we can move forward with this.

So thank you, and thank you for the speakers, for coming here and sharing this with usment and I look forward to ongoing communication about some of the issues raised today.

>> SATISH BABU: As we close, I would just like to mention that the technologies for the differently abled are almost always one step behind the mainstream technologies. And sometimes this can be a problem. Right now, in ICANN, we getting into the International liesed domain names. When this happens, you'll have a problem that people are going to compose e-mail IDs in nonRoman scripts. Now that might pose a problem to some of our users in India, because their screen readers may not be capable of rendering such scripts. So we have lots more work to do in order to ensure that we are able to keep pace with the development.

I have one comment from an online participant, Julie Madam Macfee, who says thank the speakers for a very interesting and valuable presentation.

On behalf of the organizers, Gunela and I, I would like to thank all the participants. Gunela, Dipendra Manoha, Sunil and Arun. We apologize for the initial glitch when we got started. But it's good to know that we fixed it. So the sessions tomorrow will not have it. So we made a contribution to the general good.

Thank you to the audience who are here and raised questions. And we hope that this work will continue and all the people here are veterans and that the work will continue for the future.

We are signing off.

Thank you.

(Applause)

(End of session, 17:00)

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