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ITU Workshop on "Enhancing human life using e-services"
GENEVA, 25 MARCH 2019, 0930~1245 HOURS CET

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OPENING SESSION

>> JAROSLAW PONDER: Ladies and gentlemen, it is time to start the workshop. This workshop is held within the framework of the Study Group 16, which has the meetings this week.

Also, this meeting is held within the framework the Original Initiative of Europe in order to kick off activities of the Regional Context and also to create the synergies of this work going on at the regional level and at the global level.

I have the pleasure to hand over and to introduce and to us the Director of the Telecommunication Organization Bureau, Mr. Chasub Lee, and his opening remarks of the ceremony.

>> CHAESUB LEE: Thank you very much. Good morning, everyone. Welcome to Geneva. This workshop is a collaboration effort of this regional for Europe and ITU, especially Study Group 16.

Our collaboration with the Development Bureau is quite important, so we always highlight it and want to show we're working together, many of the different bureaus working together to become one ITU.

So I'm very happy of the looks of this workshop, especially this workshop is "Enhancing human life using e-service." Whenever we have new emerging technologies, nobody thinks about the good side and bad side. We are to use these emerging technologies like artificial intelligence, machine learning, robots, Blockchain, Cryptography. Many new emerging languages are coming, and easily we start to think about backside. How the robots might be killing the people when robots could take my job,

so can easily think about the bad side.

We have to think about how to overcome or minimize the bad side as much as possible, but we are not only studying those avenues, but we also have to do our best to use the emerging technologies to improve human life. In this regard, I believe this workshop is quite important for all of us, especially ease of use. It's not easy to use. We understand ease of use is very helpful to improve human life, but taking into account many different natures of this are human beings, so we have a different level of knowledge, different level of accessibility, different level of cultures, difference of many, many, many differences.

Taking into account all of these differences to ease of use, to improve human life, that's not easy. I just want to put what I discussed when I visit WHO in the year 2017. We had ITU, at that time is we tried to organize how AI will support the Sustainable Development Goals. One of the goals is -- and I believe it's a subject today as well. So I had a chance to brief the Director General of WHO, Former Director General, and when I brief of this how AI will improve our human life, she brought to the idea, as you notice she's coming from Hong Kong, she's a Chinese lady, she talked to me, each country, each province, even each family, they have their own personal treatment for health. Normally it was not seriously taken into account because of scientifically it's not proven, but we know it worked.

So in my case I'm from South Korea, and in Korea you have a baby, a young baby have a bad stomach, the mother always said and uses her hands to softly touch this stomach area and say my hand is medicine, my hand is medicine continuously, but it works.

We don't have any scientific evidence, maybe today we have some evidence, but she brought of this concept of our emerging technology in order to collect such information. So each treatment or each family or each race or each race or each country is applied and it works. If we can collect such data to process, providing us very, very basic fundamentals for improving the health. Pretty sure without any support, any medical instrument or medication right now, it will certainly improve our healthy environment which should improve our life. So she was very excited being able to work together with how AI data will bring and improve our health. That is what inspired me. I was very happy with this. This is one of the critical examples of how we can utilize emerging technologies to improve our life.

Study Group 16 in ITU is ons e-service and Study Group 16 has many expertise to make over the technologies to support the serviceses. So today's work is also relevant and I believe a serious and through this workshop we'll give some more clear guidance about workstreams of what Study Group 16 will address in the future.

We see more and more from many areas to use of ICTs so we already have e-health working together with WHO at this coming AI Focus Summit and we will challenge AI for Agriculture and we had some issues on the AI for e-education, so AI for e-cultures, AI for protecting culture or heritage, or cultural history called

heritage protections. Many, many subjects. All of those subjects it is the case to use ICT to improve our human rights.

So this workshop, I believe had address, and I believe we have our wonderful speakers, and excellent discussions will happen.

So having said that, I wish to you to enjoy your stay, and I'm expecting all the discussion will collectively guide our experts to provide this study in the Working Group. Thank you very much.

(Applause).

>> JAROSLAW PONDER: Thank you very much, Director. It is our great pleasure to have your inspiring words to use all of these to transform our life for better in the future. We're very happy from a European perspective to be here and part of this exercise. As you may know, the WTDC has agreed on the set of the Regional Initiatives, including two, which are directly relevant to the topics which are addressed during today's deliberations, one on the digitization and we improve -- to improve the e-government services and the second one which is focusing on the ICT accessibility.

And of course, the accessibility is very close to the heart of all of us. In Europe and Member States have called for concreting the unique platform accessible in Europe to discuss and implement accessibility, improving not only the policy dialogue in the accessibility but also to improve the implementation of the concrete projects, and that's why we're very happy to work and enhance with the standardization sector on, and the issue of the development of the international standards and taking a look at how the regional standards can also contribute to the global process, and that's why today we'll have also with us one of the experts and one of the background papers just published on the website addressing the issue of the procurement and the development of the standards of the procurement of the ICT, accessibility ICTs and products. This is not -- this is not a coincidence that we picked up this issue and this is one of the most strategic occurrences currently which has the potential of impacting the increased accessibility in terms of the access to the ICTs on the equal footing, and we're looking forward to your comments and debates in this particular session.

We'll have also today one session on the ICT accessibility where we'll be looking at the new avenues for the working standardization, but also the work in the innovation in the fields of the ICT accessibility, and so this is also for us from the European perspective a very important aspect because last year with request of the membership we have launched the mechanism for collecting the innovations and digital or innovative digital solutions for Accessible Europe, and we would like to do this in a larger scale and that's why the work with those who are working with those on a daily basis on the standard developments and the innovation in this field is of our key importance and key importance to our membership.

Of course, this session following the Opening Ceremony is one of the most exciting, one of the most exciting from the

perspective of European developments, and the work of the divisions and intelligence is embedded in the national strategy making, and this is the reason why we'll have also several contributions in this context and to see what is happening at the level of the strategy making, but more important at the level of the technology development and to enhance the e-services and for our groups, and in particular in our context, and to make sure that the e-government services can benefit the most from the artificial intelligence, which is still under the development and having read very concrete proposals to the governments and the service providers.

And so, Director, we would like to thank you very much for this good partnership, and we're looking forward to the future cooperation, and also thank you to all the speakers who will be joining us today on the panels to build some concrete outcomes of this, which will pave the way for the implementation of the regional level of the Regional Initiatives, but also equally important and even more important they will contribute to the standardization at the global level. So thank you very much, and as my role, it's also to moderate and we have the two group announcements.

So one is that just right after this Opening Ceremony we will go for the photography, the joint photography, and after that we would like to invite you for a symbolic cup of coffee with us pastry, yes, pastries the good pastries, there is no free breakfast as some are saying. So thank you very much to the Director for being with us this morning and to strengthen our message to our membership. Thank you very much.

(Applause).

And now we are remaining guidance from our colleague photographers who will tell us where we have to go. And as always happens, photographers just left the room to prepare the venue, so we remain guided by our Secretariat who is saying that we should go just outside and we'll find the way. Yes. Thank you very much.

(break).
(silence).
>> Hi. Good morning, everybody. Please be informed there is coffee outside. There is coffee outside for everybody before we begin the next session. Thank you.
(feedback).

Session 1 : Artificial Intelligence (AI) for e-Services

>> YUNTAO WANG: Ladies and gentlemen, we are about to start the firgs session of the workshop. We hope that you've had

some networking time and so you can talk to each other by name, so we have the pleasure of welcoming here to the firgs session, as I said, I would like to invite all speakers of the session to join the podium, so welcome to Christian Vogler, welcome to Marcel oa Moreno, welcome to Jiro Nagao and welcome to madam, Lucie Berger and also welcome to Sophie Treinen who is with us, will be with us on the screen but not in the room.

Ladies and gentlemen, it is my great pleasure and honor to hand over the floor to our distinguished moderator of the session, Yuntao Wang, the Rapporteur of the Q5/16 from the China Academy of Information and Communication Technology from China. Mr. Wang, the floor is yours. Thank you.

>> (Speaking off mic).

>> Say your name for the captioner before you speak. Thank you.

>> YUNTAO WANG: Okay. Good morning, ladies and gentlemen, welcome to the workshop from services, and first off my sincere thanks to ITU for hosting this year. Oh, I was thinking about a little introduction of myself later, but my name is Wang Yuntao in Chinese, maybe the same in English, but I'm the Rapporteur of Q5/16 the mull tie media and also working as engineer at the China Academy of Information and Communication of Technology. It's a great honor to be here as moderator for the first session.

First off my sincere thanks to ITU for hosting this event so we all could all know how artificial intelligence is actually and will be benefiting people, so let's welcome our first speaker, Christian Vogler, From Gallaudet University from Washington DCUS to deliver AI Promises and Completes, let's welcome him.

>> CHRISTIAN VOGLER: Thank you very much. This is Christian Vogler speaking. In this presentation, I'm going to touch on some topics related to AI for accessibility. I was interested to hear this morning that accessibility is important, and I think we can all agree on that.

AI has an incredible potential for accessibility, but there are some issues right now which have not been solved. So my presentation is going to bring light to some of those issues and show where and how AI can help solve them.

We're going to look at the evolution of technology over time a little bit. In general AI for Accessibility has three main areas where we could be benefiting a great deal. The first one being scale, providing access for online content for media is a lot of work. For example, if you think about the fact that every minute 300 hours of video are uploaded to YouTube, and how those 300 hours could be made accessible which is beyond human capacity, so if we have AI services, we might be able to have and allow citizens to participate in the discussion. You have to worry about scale. So AI can provide assistance to make content accessible and that could help a lot.

The second area is customization. So people have individual needs. For example, some people prefer sign language, others rely on captioning. I prefer verbatim captioning. I want

word for word what is being spoken on the captioning, but that's very fast, that's 180 words per minute, and other people prefer -- our research has shown that other people think that 180 words per minute is too fast, so that means they need captioning at 140 words per minute, so how do we then make a message clear at 140 words per minute?

So these are the different customization issues that we're working on in terms of making things compatible for everyone's needs.

The third accessibility problem has to do with modalities. Some people prefer listening, some people prefer the information visually, some people prefer the information on a textual level. Accessibility needs to fit the way that we communicate. AI offers a lot of promise in this area as well.

So, these are the promises of the future, and I now want to talk about some examples of what's working and what's not working so well today.

So I'll start with a positive example. Gallaudet University, where I work, has collaborated with Google to create a new app that supports face-to-face communication.

(silence).

>> Hello.

>> CHRISTIAN VOGLER: That app allows you to use your phone to --

(silence).

>> Can you hear me now? Okay. Great.

>> CHRISTIAN VOGLER: So the app which is called Live Transcribe helps people communicate face to face. So when I'm communicating with someone using spoken language, I often have to guess what they're saying. Live Transcribe will actually write what the person is saying on the screen of my phone, so if you have a situation where you don't have an interpreter, but you want to network with people, Live Transcribe helps a great deal. It doesn't replace interpreters, but it is an AI addition which helps communication.

The overall design works because the Deaf Community works with Google to make sure that the app is usable, straightforward, and it has a simple interface that meets our needs.

So the take-home message from that is always involve the community of users in your design and the product will be much more successful. Next slide.

Next slide, please.

Okay, so in was our best practice example, and we now have an example on the other side of things where things went terribly wrong.

This is a recent example taken from American television, and as you can see, the AI created a very racist captioning, and of course everything was blamed on the AI. The AI made up a statement, which if you can't read the screen, it says thank you thank you God hates Muslims know who are you." What was really said is hey Rebecca Sweet, will you take my jacket for me, please? "."

So this had is a warning in terms of how AI can be applied

and create very unpleasant situations and so we know through this case example that AI does have its limitations.
Next slide.

So how can ITU be involved? We are looking at KPIs, Key Performance Indicators, such as accuracy, latency, punctuation, pacing, and we are setting up guidelines on how the appropriate application of AI and developing best practice models for ASR, Automatic Speech Recognition issues and how that works with AI.
Next slide.

So, this had is a slide about AI and customized content. This is a special project which is called Content Clarifier. This is an IBM Watson project, and the idea is that sometimes people don't understand texts which are quite complicated, so the text needs to be adapted to the person so that they can better understand what's being presented, and this is targeted toward people with intellectual disabilities and this is another example of how captioning speed needs to be adjusted to a slower word-per-minute count.
So next slide. This is basically what it looks like. So let's imagine a point in the future where you have the deaf/blind person and you have an interface with a mobile application and they're reading pace is about 30 words per minute, so rather slow, and if a person is speaking too fast the deaf/blind person is not going to be able to read what they're saying using Braille, so they're going to have to -- there is going to have to be some type summization toal allow thedeaf/blind person to understand the message. Another example that I just mentioned is that some people just cannot read 180 words per minute for an extended amount of time and therefore information will be missed, so the AI will need to take the content, summarize it to a level which is more appropriate to the reader, and that in itself is a very powerful application of what AI can do.
The technology at the moment is not ready, mind you. I've experimented a little bit with it, and I can tell you personally, it's definitely not ready because there are a lot of mistakes and misunderstandings that happened throughout the process of summorization. Next slide.
The big issues here is that with summorization we have to have a back check to make sure the message is the same as the original message. The second thing I'd like to mention is that AI is not replacing humans. What we have -- what we need to make sure is that the original written text is clear and then AI can take that further for summarization, and we're also looking at the users and preferences. How do we decide the appropriate level of summarization that matches a person's need, and we don't have an answer for that right now so more research is needed.
Next slide.

The last area I'd like to touch on this morning, and this actually puts good fright into me, is the fact that web access for a lot of blind, for a lot of blind people relies on voice

assistance, and voice assistance, I'm afraid, is going to put L deaf and hard of hearing people into yesteryear. So because they're so prominent, one-third of all households have a voice system in their home, and as you know they've been very prolific, so that's on the one hand a very positive application of artificial intelligence because it helps people who are blind to become more independent in their homes, it helps people in wheelchairs to be able to increase their mobility, it improves their experience at home.

It also helps people who use argumentive communication and alternative communication, so I'll say AAC for argumentive and alternative communication. So it's absolutely wonderful, so don't get me wrong, but for Deaf and hard of hearing communities it's quite scary how much we're relying on voice interface. Next slide, please.

So if we look at this from a global perspective in the future, we know that voice assistance is not going away and it's only going to get bigger. Voice interface is going to become more and more familiar and more and more personalized and more and more natural in terms of its output. Some people are going to take advantage of that for people, and that's for people who can speak, it's very, very efficient.

On the other hand, if your speech is not clear, such as my speech is not as clear as others, so I don't know what to do when faced with a voice interface interaction. Some people would say oh, it's fine, just type, but it doesn't work. The reason being is that you can't type as fast as you can speak, so I would encourage all of you to experiment a little bit with trying to speak to Alexa, say Alexa, turn on the lights, and then try to type Alexa, turn on the lights -- you know, it's not the same effort. That's not where the future of technology is going and the future of AI is going.

So Gallaudet University has done a number of experiments and has researched gestural interfaces, signing interfaces, and typed interfaces, and people don't really like the gestural interface, but what they do like is to be able to interface with sign language, but the technology is not there yet for sign language, which means our current situation is that if you don't know how to make the voice -- is that we don't know how to make the voice interface equal to sign language users.

Next slide, please.

So, what do we do going forward? We have limited use cases, contained use cases to experiment with these alternative input methods. So, for example, if you're in the kitchen, what you often do is set a timer and you watch a video with instructions on how to cook something. So, this is a very limited-use situation and this is a great starting point for us to be able to investigate how and what options there are to engage with a voice assistant.

The second thing we need to do is really focus on sign language itself. We need to have large amounts of data to be

able to feed into these and that's very, very expensive, so when you're collecting data, you need to make sure the data is in the right format so that it's usable by the technology.

We also must have UI guidelines, User Interface Guidelines for how a visual, auditory, and tactile interface can work. And last, I really want to, and this was really kind of a painful lesson for Gallaudet University, is that when you're interfacing with a computer, you have to consider cultural factors because cultural factors impact the way that we communicate, it impacts the way that people receive communication, and that should be included in our guidelines.

I think my next slide says that I'm done, so with that, thank you very much. In summary, AI has a lot of promise, but at the moment, there are lots of things that can go wrong. Thank you.

(Applause).

>> YUNTAO WANG: Thank you, professor, for this wonderful speech. It also leads to several very interesting and very important questions. Any questions from the floor that we want to talk about it.

(terrible audio feedback)

>> This is Chris, it's vital that deaf people must be able to participate in society -- (audio feedback) -- because in the future we do not want to be left out so thank you very much for that very important presentation.

>> This is David speaking -- (feedback) -- so first of all, I'd like to comment, thank you again Mr. Vogler for your comments and presentation this morning.

Within the ISO, within the International Organization for Standardization, there has been a fair variety of work in the ergonomics particularly around user interfaces and tactile, somewhat inauditory spaces, so I certainly invite you to sit down with me and we'll find ways of seeing if we can find some answers to some of your questions.

Beyond that, I -- as a hard of hearing person, I also want to state that I agree with you. The hard of hearing voice is not well supported in the current AI systems today, in current voice recognition systems today, and I think that for those of us who are hard of hearing and want to live our lives as close to that as other hearing people as possible, it's vital that technology support the hard of hearing voice. Thank you again.

>> CHRISTIAN VOGLER: I completely agree with you. This is Christian speaking.

>> AUDIENCE MEMBER: Thank you, Mr. Chairman. I'm the Rapporteur of Question 26, Study Group 16. And Question 26 Study Group 16 is developing a guideline for artificial intelligence as well as automatic speak recognition, and it would be great if you can make some contributions regarding the points that you have just delineated today in your presentation. Thank you.

>> AUDIENCE MEMBER: Thank you, Mr. Chairman. I would like to thank Professor Christian for this presentation. My

question is concerning the AI engines. How much data do we need to train the engine to produce an efficient translation for sign language, and if the efficiency can be achieved currently in these days? Is it acceptable or it's beyond expectations? Thank you.

>> CHRISTIAN VOGLER: Thank you for your question. The short answer is right now we're not sure. Sign language recognition is a very complex issue. I've seen some work investigating sign language recognition and we're not even close to anything looking like natural sign language. The applications which have been created are extremely limited. At Gallaudet University, we have partnered with a company to collect some sign language data, and I'm trying to remember exactly how much data. It was well over 50,000 -- 50,000 examples, and we're still struggling.

So, yeah, we need a lot of data. My gut feeling around this says that if we focus on American Sign Language, we're going to need to set up a project to make this successful, and a minimum of 20-million dollars just -- a minimum of 10 to 20 million dollars just to set up the data collection. That's my initial feeling. Thank you.

>> AUDIENCE MEMBER: I don't have a question. I just want to comment. Okay. Thank you again for presenting this very valuable speech and let's move to the next speaker. (this is Yuntao), his topic will be impact of AI, blockchain, IOT, and centralization of future application. Let's welcome him.

>> MARCELO MORENO: Good morning, everybody. This is Marcelo speaking. I will talk about some technologies that are really in the computer science field and some of them are under study here at ITU-T and the idea is to talk about each one of these technologies and how they relate with each other and how they can change our interaction the way we see multimedia systems.

So there are some evolving technologies and approaches, and we want to discuss their impact in the human lives. So I want to talk about integrated broadcast-broadband, IBB, Blockchain in the Distributed Ledger Technologieses of DLT, Decentralized Apps and Services, Dapps, and Internet of Things, IoT, and Artificial Intelligence, not so much, but I'll talk a little bit about this.

So IBB, so Integrated Broadcast-Broadband is a system that supports the concepts of being delivered by multiple sources, so it allows for a new set of applications where multiple content can be related with each other, independently of their source. The idea is that you can have any combination of terrestrial TV, broadband services, OTT, IPTV, cable, satellite, and the content types can also be various, so you can have an audio/visual content, music.

And at the end of the day, what the user will see is -- the user doesn't know where the content is coming from because it will be a seamless experience. The user will switch from someone source of content to another, being recommended to do so by a recommending system and these recommending systems, they are also systems that now support metadata from multiple sources, the

systems are being embedded into catalogs, portals, and they are able to recommend not only ones like we have in the web-based TV, but also linear TV, so while a use certificate watching linear TV, he can recommend to start some music content and vice versa and can go back any time to linear TV if the programming is related and of his preference.

Okay. Content recommendation is also in realtime, so time notification or a pop-up may app indicating that the user may have content that is of his interest.

Okay. And this is controlled by the broadcasters, by the service providers, and the device has supports of the signaling of these kind of applications. And then now days we have some emerging technologies like hybrid Cast and HbbTV and Ginga and have the recommendation by 2075 that there will be assistance and that the technologies are listed there and explained. There are more specifications relating to integrated Broadcast-Broadband that are on the ITU IRG-IBB and ITU SG16 is wufts Study Groups of IRG.

Some examples of the system is a French channel will have the content and the summary of content with broadband and the content doesn't have to be on demand. It may be some other TV channel that can handle in realtime.

And another use case of IBB is the use of companion devices where the content may be synced -- synchronized with the main screen content. So in this example we see the TV program on the large screen and on the tablet. On the tablet you can see some interactive elements that explains better the content. So this can also be used to support -- and application. We are learning about I think --

Another use case is targeted advertisement, and the idea is that you have broadcast content, so linear TV, and during the break, the advertisement break, you can -- the broadcaster can decide to switch the advertisement according to the user preferences, and so the alternative advertisement must come from the broadband channel, right.

And for a perfect transition from the linear content to the broadband content, it's very difficult to achieve, so the IBB system must provide some functionalities where the alternative advertisement can be cached before being presented, so we can make sure that the quality of the video will not be impacted by the switching.

Then, as you can see, the video comes back or goes back to the broadcast. The user would receive one specific advertisement, and another user would receive another one.

We can also envision some content expansion applications where instead of being limited to HD or 4G video we can extend the video to greater resolutions or even to 360, just as example here, the user would be able to choose the viewpoint and have more immersion into the content.

So the users would be impacted with the new experiences, but also the broadcasters and service providers will be impacted by knowing the users better, like they will collect a lot of information from how users are interacting with the content

because now they have this return channel that was before the IBB systems.

So next technology is Blockchain. Blockchain in general we describe it as a DLT, right, a Distributed Ledger technology, and basically if there is a transaction to be done between users A and B or Systems A and B, for example, A wants to send content to B, the first transaction contains the content hash, ownership, so we build one block and this block is broadcasted to all users of the network for verification. And each node in the network can analyze this block and if approved by most of them, the block is validated and then can start into a chain of blocks, so the name of Blockchain.

So the history of transaction was added to the Blockchain and then it cannot be changed. And then also the transaction is validated into the Blockchain. The content that has been the target of this transaction.

Multimedia, we can see that we need some technologies that will embed some information into the media, so we have the original image that will be compressed, and for verification of the image, we need to add some invisible watermarking into the image, so the watermarking must match with the transaction that will be registered in the Blockchain. So the transaction stream contains ownership, transaction, and modification history represented as blocks, and the watermark must match with this workstation.

And then we will have the block and the watermark string, and we can generate the final image file as well as we can add the blocks to the chain. In the end we have the media database server with the media database registered to the Blockchain.

This I think is something that is being discussed right now, how to embed this kind of information in JPEG files.

So, the impact of this is Distributed Ledger Technology, we can introduce reliability and accountability for multimedia content, including user-generated content. We can -- we will be able to know which user generated the account and he would be responsible for that.

Another application that DLT is used for is the basis of user rewarding systems based on their engagement with a service. So we will compute for how long the user is interacting with the service, if he is contributing or not, and this can be returned to the user in work.

There is right now the focus group on DLT in ITU, and I think many of these use cases are being discussed.

With Blockchain, then a node technology is back into the discussion which is the decentralized applications. Decentralized or any application which files the tech, doesn't rely on a single point, so but the term, Decentralized Applications, are now very population because many of these applications are using Blockchain and Distributed Ledger Technology.

The desire is to come back with that re-decentralization that was the way the Internet was received. And the technology itself allows us to build applications with a low-cost

distributed infrastructure because of the peer-to-peer nature.

So now user-to-user, it's reliable and accountable multimedia services are possible with no central point or no middleman to provide for. So what we think about this is what if the decentralized apps meet ad hoc networks? So we can -- we'll be able to give the communities power to establish ad-hoc networks for their multimedia and Distributed Apps and based on digital inclusion platform.

We can bring all the ideas that DLT allows, or for example how to reward the participation of the user engagement, rewards, so the time and node is connected, the contributed storage, contributed content, media consumption, and we may make this happen with involving external stakeholders like government, advertisers, and contented service providers that may be interested in bringing their content, their structure, some computing resources, connectivity to this, and these will be just hoping to credit in this reward system that the users will be benefited.

So, the next one is Internet of Things, IoT. You see the IoT here but you see the very segmented market and we see some solutions for each kind of application that you are interested in. For example, the Smart Home industry, and there is no way you can just develop an application independently of the field, the domain. This is a single API, and there is no single API, so what you see is, okay, we have some IoT setups that are accessible with Blockchain, but there are some limitations and we will have to know each kind of sensor in that that you want to put forward.

But for multimedia systems, what would be very interesting to a multimedia system is, yes, what if we have a single way to develop any kind of IoT application? If we see IoT as a machine, where the sensors are input devices and actuators are output devices, and also devices are just a set of input and output frames. Lets the user to understand IoT as a machine and it may be easier to present to them. IoT would be interoperable and also would be a specific language or programming that would be at a higher level than the current programming language that we have. (Speaking off mic).

What kind of multimedia applications may be provided using IoT? This one is not new. In 10 years we discuss about Multiple Sensorial Media, Mulspmedia, you can add to the content like paste, and can jointly it demands manual altering, very much to create such a content. The idea is you have to aggregate the content into the video and treat a distal representation that would be encoded and transmitted and then on the user side the code should be decoded and rendered using special devices. That we can see as an IoT application, right. We are working with many actuators that can reproduce now audio, light, wind, these kind of systems, but if you want to create such an application, you have to create very specific source code related directly with these devices.

Then we can also talk about the Multimodal Interaction,

what is that? The user is able to at the same time use more than
one way of interaction. The user can point and also talk to give
a specific comment, and so it's voice input as well as gesture
together. This is a photograph from a paper in 1980, so Richard
Bolt was researching about such a Multimodal Interaction and he
"Put-that-there" paper which describes what interaction that
would be interested for multimedia. So the user here is just
pointing at a country on the map and giving a voice comment and
pointing at another part of the map.

        So, again, you have to create this kind of content with
knowledge of all of these transfers or image transfer or voice
and also specific layouts and that is really hard to program.

        On accessibility, we can think about using some actuators
to give some different lighting vibration. This is a setup
created by a company called Mspace and the setup is called
Sensory Nook and the idea is you give a sensory aspect to help
users with specific disabilities. In this case there is place
where the user sits, some different lighting and mirror, et
cetera, so again it's an effect of actuators that help the user
to acquire some kind of profit, right.

        So again, it should be modeled the same way. Everything
here is IoT. What we see is for each domain of application that
you have, a different way to program it. This should be easier,
right.

        E-health, another application of IoT, we have transfers and
the user has some wearables like the heart rate monitor, the
respiratory rate, motion, and cell phone that can provide the
application. We can capture it and upload it to a Cloud
application that could be accessed by health doctor.

        >> Hello.

         >> MARCELO MORENO: Health professionals and family might
use it and emergency services. So the information that the user
is sending, so this transfers through the Internet and if needed
some observation is provided by the professionals or the family
there.

        Again, you have to know what kind of environment, what kind
of application we have to develop and use a specific API specific
for that.

        And last up is Artificial Intelligence, I will not go deep
into this. Now days Artificial Intelligence crosses some
multiple application domains so I will just discuss some examples
of technology that we have seen in this presentation, how AI can
be used. So in IBB applications in the Integrated
Broadcast-broadband. A I can take the lead in multimedia based
on data and experiences and can decide better what kind of
content the user will need and what kind of advertisement or
targeted advertisement is in need.

        In Multimedia DApps AI can take the decision on the
distribution of content because everything is there, and so can
have an AI-powered control of how the application will be done.

        When the content must be fetched, so the user will not have
any discontinuity during consumption and then also other
autonomous actions. And IoT applications, multimedia, right, AI

recognizes voice, natural language, gestures, faces, and combination of those.

And also, AI can be used to adapt the data from the available sensors and also adapt the data that can be available, actuators, and take some autonomous actions.

So I think there are many other uses in cases to come and AI can be applied to multiple applications and this is one and especially for that -- (Speaking off mic). Thank you very much.

(Applause).

>> YUNTAO WANG: Thank you, Professor, for this wonderful speech. Any questions or comments from the floor?

>> Andrea, now, I don't know enough about Blockchain so I don't know if you can take it out. But I have some facts that the course can be traced. Now, how do we protect people when the government doesn't like the video that you put up or doesn't want you to access stuff like that, it's very easily breached. Do you have any thoughts on that? Thank you.

>> MARCELO MORENO: Thank you for that. This is Marcelo. Yeah. If you want to rely on Blockchain or this kind of system, users must be aware that they are given express information about their responsibility on the content they are providing, so users must be careful about that. I understand that if somebody doesn't like the kind of content that a certain user just uploaded, when you have this kind of system, and it works, they users get comfortable about it, you can't do anything about the privacy. There is no way -- but anyway, this is when you think that users are providing content and they're responsible for that, and they should think that if what they're expose something really appropriate or not, right. It may have some political issues in the content, et cetera, but anyway, we can also create -- we can rely on Blockchain still, but create some kind of anonymous posting. Just, we can have a system where we know somebody posted content, we know the content will not change, but we don't know who posted it.

It depends on how we want to work with -- (Speaking off mic).

>> AUDIENCE MEMBER: Morning, ladies and gentlemen, my name is Nalo and the Chairman, and I think this topic of AI, simulation to enhancement is quite interesting. I have some general observations because AI, machine learning, there is a large class of exciting technology coming. We are on the point of helping people, human beings to have an enhanced life, this enhanced life for normal human beings as well as for human beings with disabilities.

In this sense, I think AI and machine learning should have requirements, special requirements from people with accessibility issues. And understand that AI and this new way of AI the technologies mainly driven by machine learning, deep learning, all of these technologies achieve breakthroughs through one another based on learning from huge files of different datas, so they accept the performance of AI technologies on human beings (impact) on enhancement, likely depends on the data and which we're learning from.

I mean, in a sense the requirement for accessibility are different in the Working Group, different Task Force, and they need to if the first place contribute the special requirements for people with disabilities and also have to build up some data files from which the AI and machine learning technology can learn effectively. Then by doing this, we can help to build technologies which are equally well accepted for normal human beings and human beings with some sort of issues, and that's called empowerment, and I would like to challenge the status of accessibility and status of AI for multimedia, they can work close together from the level, maybe from the data-side level, and this is my comments for all blocks of people and experts as well (?) and user interaction and collaboration. Thank you very much. That's my comment.

>> YUNTAO WANG: Thank you for the comments and suggestions. We'll take note of that. Also, I think you've brought up a very interesting topic because to my understanding, my questions focusing on artificial intelligence and multimedia applications, but now days I think the problem lies here. People who are working on artificial intelligence, they don't understand the specific needs of different fields and those with accessibility issues and those with cross expertise, and who need AIs to facilitate their services and also their life and work, they don't know AI technologies. And so I think our study groups as well as our questions will be a very wonderful platform for those who are providing AI services as well as those who are utilizing AI services, put them together, and we could achieve something very meaningful to both sides. This is a blooming situation. Thank you.

>> YUNTAO WANG: So, any further comments or questions? Okay. I see none. Okay. I see none, so let's proceed to the next one. Mr. Jiro Nagao, Research Engineer and his topic is AI-based realtime Image Extraction for keep immersive Live Services. So let's welcome him.

>> JIRO NAGAO: Thank you, Mr. Chairman. My name is Jiro Nagao and I want to talk about AI-based realtime and Image Extraction with introduction and interaction for AI with examples of live experiences.

Here is my overview of my presentation. Especially I'll talk about the objectives of our work to overcome the limitations of TV. Next, I'll talk about how I've measured my experience, and then how entities are being researching and developing Kirari technology to real life experience. And most important in the AI-based realtime image extraction, and how it is used for image extraction.

Lastly, I'll show you some demos of Kirari! For Arena and examples based on my experience and user's based AI realtime extraction.

So the limitation of TV is that there are things that are full of experiences that TV can't broadcast. For example, if you are looking at a statue of Buddha on TV, you cannot tell how big the statute really is and you cannot see from the left side or from behind.

Actually, the Buddha is this big, it's actually 18 inches high, and what we're aiming at by immersive live experience is to that you feel the real size and real feeling of events. There are windows on the back and you cannot tell if you are looking at it from the front of it on TV, but again we're planning on providing the users with these views to let them experience the whole situation of the event, that's what we're aiming at by Immersive Live Experience.

So NTT has been researching and developing on Kirari Technology Suite to realize the Immersive Live Experience which includes from material acquisition to media presentation, and many technologies and includes realtime image extraction to provide media stitching and other technologies. It has Reality Reconstruction Technology as well.

Today, I'll talk something about how AI-based realtime image extraction. It has background and foreground by AI, and it removes the background. For a picture, so that the object -- the image of the object can be used for Immersive Live Services. And by the way Kirari means sparkling and twinkling in Chinese, so we seek to brighten your eyes by these text nolgs.

So AI-based realtime image extraction, it learns the color pairs of foreground and background by neural network, and the input is the pair of color information of the foreground and the color information of the background of the same position, can control the balance in the same position from the foreground and background and by neural network, and then the neural networks learn that the color pair is the foreground.

And the same goes for background as well so you learn how background color looks.

The experiment shows that our AI-based extraction method is better than the traditional background extraction or traditional SVM-based extraction, and you'll see in the next slide a video that has inputs and background extraction and XDM based extraction and our AI-based approach.

Here on the background extraction on the upper right side, there are some floor patches and on the left bottom picture the SVM, there are some holing in the players. Now I'll approach on the bottom right size, there are less patches and holes in the players.

This is -- I'll talk about Kirari for Arena which uses AI-based extraction technology and this is an example of Immersive Live Experience Services.

In this device, it shows an area or images with technology that actually shows all views, or all directions of these from front and rear and left and right, and this device must require headmount display, and you can see it by the eyes, and which also it works in realtime and it shows some depth perception as well. When you look at that picture of the player, you can naturally feel that the player stands further back or the player walks with you s.

This is the system configuration of Kirari for Arena. The full camera in audio action is around the player and it captures the full views of the players. Then the AI-based image

extraction, the background is extracted from the player and there is a positional sensor as well near it and it tracks the position of the player. And the AI -- the extraction image along with the tracking information transported by MMT which is being discussed in Question 8 or 16 as H.ILE-MMT and we had some presentation to extract the image to give you some depth perception, and this is the application reproduction with of our event inside.

This is demonstration video of Kirari for Arena. This is muted because the language is Japanese, so we'll show the demonstration now. This is the real site and that's the display. You can see the reproduction of the player, the camera, and the camera captures the player from different directions, and it extracts the player in realtime and shows the player by the technology, so you can see and walk around that player to see around the image, the left image, or even behind.

So the future developments may include remote surgery, e-education or adult care services to enhance people's lives and then their experiences.

A future challenge for AI may be to create back view without back camera. Although it seems impossible to create such an image with windows open at the back, but you know, if AI has enough knowledge, then maybe it would be possible to or the AI to know that there are windows at the back and maybe it can create the desired image from the required viewpoint.

We are discussing Immersive Live Experience in Question 9 in 16 and we have another session tomorrow as well, so if you're interested in this field, please join us in Question 8. Thanks for your kind attention.

(Applause).

>> YUNTAO WANG: Thank you for this very interesting platform. Any questions or comments from the floor?

>> AUDIENCE MEMBER: Good morning. Thank you again for your presentation. This is David Fourney speaking. I do have a question, and that is when you were describing the system, in addition to the cameras being for conical points, you also mentioned that you would have targeted microphones. You didn't discuss how you would use the targeted microphone, but from my understanding and experience, as a -- as you change the point of view of the viewer of a scene, what they are going to hear is going to be different, so what they will hear or how they will hear it will change. So one of the questions I have, and I recognize you may not have even started thinking about this, but one of the questions I have is, how will you prevent the auditory information, the difference in the perception based on point of view, to people who can't hear it? And in particular, to people who don't have stereo hearing?

So today, right now with modern television, where we use captioning and we just tap into one view. My concern is that we might have to have captioning for four or five different views, so it's a question/comment. You may not have an answer, but I thought I would at least ask. Thank you again for your time.

>> JIRO NAGAO: This is Nagao speaking. Thank you for your comment. Can you show the slide again. You mentioned the

sound reconstruction and the microphone. We haven't integrated the construction with Kirari technology yet, but we have sound reconstruction technology as well and it uses a microphone and it uses directional speakers, and that technology can reproduce. Thank you. The technology can reproduce the -- I think you're talking about the intelligent microphone at the left, bottom side, right? We have that sound reconstruction technology, and there was synchronous technology on the media presentation column and it creates wave fields or sound fields so that the users can feel that the sound really comes from the player or the object.

     So our technology, when this technology is integrated with Kirari for Arena, and the users with stereo hearing abilities, then is the sound naturalized and it can hear as if the sound comes from the player. And concerning the users with hearing disabilities, maybe there should be some sound-recognition technologies to add some captions from the imagery image playing, and Kirari for Arena is an emerging technology so it suits with AI -- I mean, augmented reality technology so that it can integrate with additional information like captions and we can show information with the players, the image of the players.

     >> Christopher Jones here. I'm listening and wondering whether it's possible to help to improve the three-dimensional elements when thinking of the sign language interpreter because that's the way we're using the background information, for example as we see the interpreters here now there is a background so they would then become isolated in space, which would be much clearer for me.

     Also, then I could potentially move myself around and I could have the three-dimensional experience which would allow me to relax much better when watching. Particularly, if you can figure people participating in a meeting remotely because watching a sign language interpreter on a television is difficult because it's a two-dimensional plain so I'm asking about the potential for that.

     >> JIRO NAGAO: Yes, your comment on extracting the interpreter is an interesting thing. It should be one application of the construction, and regarding showing the interpreters and the events at the same time, we have modern display device to show multiple players of constructed images so that it presents one image maybe with the image of the interpreter and another one with the image of the players, the events so that you can see the interpreter and event at the same time.

     >> AUDIENCE MEMBER: Thank you for the comments. Remote participation here. A question for Mr. Gagao on behalf of Phil Harper. Can windows for realtime captions and sign language be added, both obviously require human intervention/support.

     >> JIRO NAGAO: The remote surgery is just one prospect of the application of the immersive live experience technologies, and yes, intervention bias theory would allow latency, so maybe it would be used in practicing and planning of the surgery beforehand so that the surgery would succeed.

     And with our immersive technologies, you don't need on

display and you need multiple users can see one
three- dimensional image at the same time, sharing the image and
communicating with the real doctors as well, so there will be a
great application of this immersive technology.
        >> YUNTAO WANG: Any other questions? Okay. Let's
proceed to the next speaker. Let's welcome Sophie Treinen, the
Information Knowledge Management for the Agricultural Association
of the United Nations and she will be joining us remotely. Yeah.
        >> SOPHIE TREINEN: Good morning, everybody. I hope you
can hear me. My presentation will be PowerPoint, so a little
film. I will present not only Artificial Intelligence but also
what are the other information and communication technologies
that are used in agriculture.
        Before really going into the technology themselves, I would
like to introduce you in my next slide to the challenges that we
are confronted with in Europe and Central Asia and also achieving
Sustainable Development Goals.
        So my next slide. Can you move to the next slide, please.
Thank you.
        What is interesting is that 60% of the poor live in rural
areas and there are a lot of migration in rural areas to urban
areas.
        For the structure, can you go back to the previous slide,
for the structure if Europe, 97% of the farmers are smallholder
farmers and this is an important point especially when you're
going to talk about new technology.
        We are facing some challenges like land degradation and
increase of natural disof thers, and then regarding food and
nutrition, it's important to note that even in Europe we are
seeing a triple burden of malnutrition which means undernutrition
ability and macronutrient deficiency.
        For Agrifood trade we have a lot of potential for potential
export potential, implementation of trade agreements and capacity
development and this is meant to give you an overview of what are
the challenges, and so the next slide is explaining what is the
FAO Mandate. The FAO Mandate in which the World Summit of
Information Society and together with the ITU we're working
together on the action line on e-agriculture.
        So, the next slide is really focusing on how do the digital
technologies can support smallholders, and also because we have
co-existed side by side with large commercial farms and they may
be unprofitable smallholders and this is a point that we have to
put and take into account.
        I would like to now continue with a little video showing
the application of e-agriculture in Europe.
        >> SOPHIE TREINEN: Do you have the sound of the video?
        (silence).
        >> I'm afraid it has failed to load the sound.
        >> SOPHIE TREINEN: The sound has been downloaded
normally.
        >> I'm sorry. No sound here.
        >> SOPHIE TREINEN: So I am going to explain what's being
seen on this video. We are showing here a farm which is using

actually the for the cows. Can you continue the video?
        (silence).
        So in this video you're seeing the cows having specific
tags and these tags are going to send information to the farmer
who is going to identify with the movement of the cows when they
would actually be ready for artificial insemination.
        Here we have a presentation of the new technology being
used in a winery, and the lady is explaining how this is saving
time for other tasks.
        And here is the presentation of how the drone, the drones
are being used to actually oversee the fields. The measurements
will be able to have information regarding the soil, but also
improve the management. And therefore, that is also another
possibility where here we have an advisory subject provider using
also the technology with the agri information which will be quite
essential from the great points.
        The scientific perspective is explaining the importance of
knowledge sharing about the data and to be able to connect the
data and to have the interoperability of all the different data
being connected to all the different technologies.
        Therefore, in Hungary, we have informed a deputy which is
explaining that it's important to actually have a strategy and
this is what they have started doing to take into account what
the technology -- the technology-driven strategy to connect not
only smaller farmers but also small farmers with the private
sector and to have a government-approved strategy.
        So there are a few examples on how, if you've been involved
for several years, to actually develop these e-agriculture
strategy that comes with the vision and action plan and
monitoring an evaluation given the strategy that are being
conceived between FAO and ITU and which has been already used in
agri-countries, meaning Asia and the Pacific, but also now in
Europe.
        So what is important is that e-agriculture is there to
maximize the benefits but also to reduce the risk, and this is
why it's important to take into account all the different players
or in the area of agriculture.
        So with the brief video, this is showing the wide range of
different possibilities, and I would like to move to the next
slide, which is the new generation of ICTs, there are different
technologies, and it's important to take into account Big Data
with the large volumes of information that are coming from
different sources such as the telecom records, social media
centers, terminals, global positioning systems and so forth.
There is the machine-to-machine, the Internet of Things, the
Artificial Intelligence, and I will show a few examples, and
Cloud Computing, and so the next slide is showing a little bit of
how these different technologies can all be interconnected. So
as we've seen for the farmers with cows, the farmer is behind his
computer, but everything is being connected with, for example,
survey drones, you can have robots in the field, you can have
tractors related to the cows, and you have more robots connected,
for example, milking robot, moving in different places. Here we

don't have the greenhouse, but you can imagine you have a greenhouse which is automated with the windows that can open according to the temperature that there is in the greenhouse, so this is what can -- an example of how future farms could look like.

The next slide is looking at the spatial technologies and also looking at how satellite communication and remote sensing can have an influence in the coastal management, so this is what we are using for all the maritime aspects to have specific leaders, to have a bench owner, and so here again we have many different technologies that can be connected.

And the next slide is more about what we can do in forests because FAO is not only talking about agriculture but also fisheries and forestry, and FAO in this case has been working a lot with collecting information for the forest using spatial information, using Google Earth, and the next slide is giving you an example of how there is a new generation of geospatial tools using data online.

The next slide we go from satellite to a very more smaller insects and this is the case of the fall Armyworm which is devastating corn fields and other crops, and therefore there was a top message that was done and being shown in my next slide, and between FAO and another they developed Nuru, an application, a mobile phone application, using artificial intelligence to have a more interactive app because you can actually use it offline and it will have pest regular nation and it's information given within this application.

The next slide is about plant disease diagnosis app. This is also using mobile phones, and here it's how you have diseases that have been already recognized, but using the mobile phone and looking at the different patterns, the artificial intelligence image technician enables in this case, it enables to recognize the different plant and then here it's also a mobile application that is being used in the community, and therefore all the information is being generated by the community.

The next slide, the next slide is here showing intelligent -- artificial intelligence for autonomous machining, and here the example is of a weed killer robot. I thought it was quite interesting to also see this robot that enables to automatically recognize the weeds and to remove them.

And the next slide is about the drones. I've used also the image of a eagle because very often drones when they're in the territory of eagles are being taken away, but here also humans are taking control of allowed drones, but what I want to show on this picture is how drones can help them with the management of farms knowing exactly the quality of the soils and also to know where to intervene with agriculture to reduce the amount of agriculture inputs and to have a more sustainable use of these agriculture inputs.

The next slide is another example of a way to monitor the soil and meteo and irrigation, so it really uses plenty of different technologies in order to actually measure the soil moisture to know exactly when to irrigate or not, but also to use

satellite data to have sensors.

So here we have the integration of several technologies.

So now that you have seen a few examples and they could be -- there could be many more, I think it's important to see why and we can go to the next slide. We can see what we have to pay attention to because technologies exist, but we are facing a true divide which is digital, rural, and gender. Not everywhere has digital technology available. Rural areas have less connectivity than urban areas, and when you can see who can actually access and use the technologies, men and women are very unequal.

We have been highlighting 7 factors to make these technology work properly so that the content is available in local languages and localized in the content. And it's important that there is the capacity not only from the private certificate, the smallorder farmers, and also being the environment.

The third factor is about gender and diversity to make sure that we are thinking not only of men and women but also the younger generation, the older generation, and to have a direct group of people adding access.

And that's why our fourth factor is focusing on getting the real access and have participatory modals to include the different users and the end users. And a few factors that if you are in a real partnership between private sector, public sector, Civil Society, there will be a lot more chance of success.

And the technologies should not be -- are meant for the users and it's very important that these technologies are also sustainable -- sustainable at the social point of view, environmental point of view, and economical point of view.

So these factors going with the principles of digital development, but to make things a bit easier, the next slide is actually using the A's questions because whenever we are using these new technologies, whether it is artificial intelligence or not, the question is is it available? Is it available? Is the connectivity available? Is the quality of the connectivity available? Is the infrastructure available? Is it accessible, meaning that do people have access to that equipment, is it known, can they get access to the device or advice, and is it affordable? I have shown the MP Read machine that is very nice, however, can a smallorder farmer afford such technology, and this will be true for any of the technologies that have been presented.

And is it affordable for young farmers with not a lot of money, for women with less access to credit than others? Is it appropriate, adapted for just the example of the mobile phone, just last week I was meeting with farmers and they had two phones. One small phone that they were keeping at home and the professional phone, which was just a phone to call. Because the small phones are too (?), so would he have to intest in more appropriate technology such as mobile phones, smartphones to be more resistant to dust, to water, to sharp, and also to enable people with bigger fingers to also use them properly, and also people who don't have their glasses to be able to use them properly, so these are all little things which are important.

And now why did I put allowed? Because if you're using drones, can you use the drone? What are the regulations? Is it possible? And also it was just for these technologies, if it's socially admitted, can women and men have the same access with the permission? And then another very important aspect, which is the question of the ability -- do they have the skills? Do they have the confidence in using these technologies?

And I write last April, a diction, of course it's not an addiction, of course it can be an addiction to the mobile phones and games, but it's to bedepend to much of the technology, so that's also very important to artificial intelligence, it's how much humans will then be dependent or not on these technologies.

And this enables me to actually show you the next slide, and to show and get input on all of these new technologies that are being here, in July also at ITU meeting showing all the different applications that you have for milking the cow, feeding with the robot, to have information to, have the tractor, to have the drones, to have information for the bank, to have advisory research, to have research, advisory resources, agency, accountant, government, from at work and from home and from the farm on the market, so all of these will plenty of information which are not specifically connected, and this is why in the next slide you see what is the challenge of all of these data because the data is the building blocks of artificial intelligence, and we have to see then to whom do -- who owns the data?

So we have these questions about the data. The data ownership, does it belong to the farmer? Does it belong to the private sector? Does it belong to the government? And the data sovereignty, so it means what is the governance behind the data. If the data are being generated by machines, who is governing these data? So at the moment we are not -- there are not a lot of legislation, neither regulation for this or it's important to take this into account.

The data security to make sure that, of course, or data are secure, especially when we are talking about financial transactions. But for farmers, it's also whether they are reliable, if it's a trusted source of information, if there is no error in the system.

Then and you could see from the previous slide, it's the data interoperability, and all of these different applications, whether they're artificial intelligence or not, how do they relate to each other? How can they be exchanged? How can they be shared? So we need also -- the data is becoming also more and more important.

And the last point I make is the open data. Are we going to have this data truly accessible to the public, can we detail it, localize it, so to me the need of smallorder farmers, and so to have all of these data available, to be able to do the connection between all the data, will show all the challenges that we're facing with the new technologies.

The next slide is actually recapping a little bit what we had with the digital technologies, and these digital technologies, they are knowledge-intense technologies, they have

a great potential to bring digital in the agriculture sectors for spreading the benefits, the benefits of inclusion, efficiency, innovation, and for reducing the risk of --

>> YUNTAO WANG: Sophie, because we have running a little bit short on time, so can you please finish your presentation. Thank you.

>> SOPHIE TREINEN: Yes. Thank you. So we want to show what will be or how we can reduce the risk for the control, inequalities, and concentration, and this leads to the importance of having a digital strategy.

So my next slide is one where and I will keep a little bit of this information, but it's just to mention that in the region of policy and government, has asked for policy and good practices for smallholders and family farmers regarding the agriculture.

The next slide is actually where this information can be found. The next slide is about the fund that we have developed, the e-agriculture guide with ITU to tackle this problem and to actually involve all the different actors around the table.

The next slide has all the issues and you can click several times to actually see all of these issues appearing like the duplication redundancy, re-inventing the wheel, high-cost of scaling up, non-interoperable, limited/no re-use no building on each other, unchord natured, ICT is ad hoc and not strategic tool, and therefore it's actually important to have governance and organization addressing all the SDGs and how can these be done. It's in developing, in the next slide, the National E-agriculture Strategy including not only the telecom sector but also the Ministry of Agriculture.

The next slide is repeating what was shown in the video that, unfortunately, there was no sound with the different path of this e-agriculture strategy.

And the next slide is showing how we should address the key building blocks for such a strategy. And here again, there are different points that are mentioned of infrastructure, interoperability, the reliable data, the data sharing and the privacy, the policies and the regulation, and the skills are the challenge of digital literacy, the gender digital divide, the data analysis, and support of it,.

You can go to the next slide, and I'll just show where some of the publications where this information can be found out, and I would like to finish with the future slide, which is under code for Digital Innovation. We are regularly trying to understand what is happening in the region and not only in the region, and we are having a call for Digital Innovation which is now available until the 8th of April and I would welcome people to join us and maybe share their digital innovation with us. Thank you very much.

>> YUNTAO WANG: Thank you very much, Sophie, for your presentation. Because we're really running out of time, so maybe for the questions, could be directed to her email and discussed later.

So let's welcome the next speaker, Mr. Lucie Berger the EU Focal Point for Transport and Digitalization from Belgium.

Welcome.

>> LUCIE BERGER: Thank you very much, Mr. Chairman, and I'm mindful of the time and I will try to be as concise as possible, especially after all the presentations coming from the European Union, maybe I do not have that much impressive AI to share, but whether I will share what's in the European Union what we actually do to promote artificial intelligence development and also cooperation with our Member States.

I don't actually have slides, so I will get to the website as you see on the screen a little bit later. I just want to focus actually on two points. As you can imagine, most of the artificial intelligence, cooperation, and development in the European Union, at least from our perspective at the EU has happened quite recently, so the history of cooperation is not extremely long.

I will only point out at the key events, notably, we actually have an agreement with our Member States from April last year, from April 2018, to try to enhance artificial intelligence development in the European Union, having understood that, of course, if we work together, we can actually do much more than if each Member State works in silos.

And to that effect, we also published a communication on artificial intelligence in April of 2018. Following that, we established the European Union High Level Expert Group on Artificial Intelligence, which actually is working on two important documents. The first one is Ethics Guidelines and that's the document that I will try to focus on in my intervention the most. And then we are also expecting them to publish Policy Recommendations around May of this year.

So the Ethics Guidelines, the final document has not been shared yet. It's actually due this month, so any day now, but the draft has already been put online and if you're interested in more details than what I will present here today, I then I invite you to consult our website.

So the Guidelines, it's not just a document that actually presents what are the fundamental rights, for example, that need to be respected by artificial intelligence, but it's really a document that should enable, for example, the private sector to, maximize benefits of artificial intelligence while minimizing the risks, and I would say that the key principle of the guidelines is promoting human-centric approach to artificial intelligence.

So it's not artificial intelligence as a tool for itself, but to increase human well-being, that's basically what would be the purpose.

So the Ethics Guidelines, there are two -- or three chapters. The first chapter explains what the ethical purpose would be, and kind of lays down the framework for ethical purpose of artificial intelligence.

Then the second chapter includes guidance on realization of trustworthy artificial intelligence, whereas we provide a list of requirements for trustworthy artificial intelligence and offer a list of technical but also null technical methods that can be used for the implementation of trustworthy artificial

intelligence, and if you can imagine, artificial intelligence to be successful, any development or any tool to be successful, it has to be trustworthy for people to actually use it and benefit from it.

And the final third chapter, which we call the operationalization chapter, it's basically providing a non-exhausting list of or assessment of the trustworthiness of the artificial intelligence, so it's a list where you can actually check whether all of the elements that we consider important for the artificial intelligence to be trusteeworthy has been tackled and of course the list is adapted to specific use cases because there are so many different areas where artificial intelligence can be used, so there cannot be just one list or for all of the areas.

And this brings me to the second project that I wanted to raise in your view, and that is our website corresponding to the project, which is www.ar4eu.eu, and it's just a platform, a European artificial intelligence on-demand platform which this project is bringing together knowledge, algorithms, tools, and resources available and making it a compelling solution for users. We have over 75 so far in this project from 21 countries and this project, which is worth was launched in January of this year and so it's very new. I'm sharing this with you because we obviously want as big of participation in this project as possible, and this is the right time, actually, to share all the solutions that I've seen in the presentation but also I'm sure there are many other solutions that you have within this project that can actually trigger more development and cooperation.

What is noteworthy is that this project will officially be launched in Paris on 18th of April, so those who are interested are invited to participate in this event. Apart interest this on-demand platform, this project is also going to develop an ethics observatory to ensure what I just underlined, the development of human-centered artificial intelligence. It will also provide -- or funding will be funding of the million Euros which is essentially European Union funding for startups and for their projects developing innovative solutions.

So I tried to be brief, and if you have any questions, you can either address them to me directly or also a lot of is actually available online on either the Ethics Guidelines or also this new project. Thank you.

>> YUNTAO WANG: Thank you. And also thank you for this very informative and meaning of presentation. Let's go to the last speaker, Mr. Draffan, member from ICT Disability Expert Group and Digital Accessibility Standards, New Frontiers. Welcome.

>> E.A. DRAFFAN: Hello I'm speak quickly but will go over the slides very quickly. I'm sorry I can't see anything on the screen. Oh, yes. Basically, most of what you have has been covered in many ways in this slide, and I'm going to go very briefly, and note very beginning when we looked at this issue at the institute, we found that many people were looking at AI and accessibility and were thinking of accessibility in a different

way, in that they were thinking of it as a way it's easy to use, we can get AI, it's all over the place. But we think of it as accessibility for those who have disability with disabilities, and in many ways what really upset us is there was still this view of the medical model rather than the barriers that possibly AI was 'causing those with disabilities.

And in our institute, we had wonderful medical research that was going on but very little on inclusion or ICT accessibility. We've already talked this morning about the lack of data, and this is very true within the disability community. There is very little data. And the problem about that is that we don't have bias and we don't necessarily have all the other ethical issues that have already been mentioned.

I think one of our major, major challenges is to make those algorithms work first. They can. It's a very exciting place to be, but we have to understand that disability is hugely diverse. It is not the same as with many other protective characteristics, and most of us have acts and laws that show us how we can support those protective characteristics, but very often in terms of disability, they are not necessarily very helpful, and in particular with AI.

So one of the feelings that we have is that we need to consider this idea of design for all. We need to look outside of our own countries, and I'm saying this with my heart here as a British person, and network as much as we can to build that Big Data, to get together on this subject.

And I have to say working with several organizations in Europe, I can see this is beginning to happen, but we need to -- it needs to happen more quickly. So, we have already got lots of exciting apps, but not everybody can use the apps, as has already been said with our first speaker this morning. Speech recognition is hugely important, but we are beginning now to make acts where it recognizes those who have different speech or poor articulate laition may not be able to speak clearly. We have acts for those who cannot communicate, who have complex communication needs, and need to use symbols. Those apps are beginning to have better prediction method ses now. AI that Microsoft spoke about in many conferences is helping us to see images if our vision is poor and to tell us who is in front of us.

We have Kaspar a robot for those who have Autism and the wonderful there is that it's helping with social behavior difficulties. Lexplore is looking at reading assessment and is something that AI does very well sometimes but we need to be careful if there is a human involved as well and in this case it's using eye tracking and looking at how someone is reading and then being able to give a diagnosis. The wayband, which is allowing people to draw visual impairments to run and feel a vibe laition and exploring individual technology. We're looking at captioning already being mentioned, and we're also looking at automated voice creation processes where we can make a voice so much more quickly for someone who has motorneutron disease or ALS and they're losing their voice and ability to speak, so these

actions are all being sped up and it's very exciting.

But as we said before, the future, we need to make the most of it and one of the things we'll be talking about this afternoon is the fact that we might be able to automatically check the difficulties someone has on the web because someone designed a website very poorly. At the moment the automatic checks are not always accurate, they can have false-positives or false-negatives and we need to improve that because otherwise the computations of how we're developing the web in a dynamic manner is going to be really hard to check in the future.

One of the fields I'm interested in as a speech and language therapist, and I'm admitting I'm not a computer scientist, is that when I'm working with those with communication difficulties, how we want to introduce symbols for them to be able to communicate. At the moment, it's extremely difficult for someone who uses symbols to communicate with somebody else across the world who also uses different symbols. Just as within talking about where we have sign language and other languages, we have the same for all symbol users and we need to be able to do the automatic translations and do it ease easer.

Finally going back to the ethics, those challenges of AI's automated judgments. We know we need to be careful with that. It's so important, so I just want to end by saying that here is an example of two young children using an. A AC or Argumentive and Alternative Communication app being able to communicate with each other. I don't think we need to be negative, I just think we need to be really careful. Thank you.

(Applause).

>> YUNTAO WANG: Thank you for this wonderful sharing and also presentations, and finally we are coming to the end of the session and I hate to see this, and I thought it would be negotiable to end at 13:30P so I think I failed, so I didn't control the time appropriately. And again, thank you for our expert's great speeches and thank you to everyone who has participated in the workshop. And we just see that from this morning's discussion, there are demands trying to work together toward the ultimate goals of human life and e-services and workshop and Study Group 16 acting work and I'm sure more achievements will be made in the very near future.

So after the lunch break, the workshop will continue with Session 2 on Addressing New Frontiers to Accessible e-Services so please come back at 14:30 p.m. and enjoy your lunch. Thank you very much.

>> And thank you to the captioners and the sign language interpreters who worked overtime without warning. You really deserve an applause.

(Applause).

And the girls at the desk who control the mechanisms. Thank you. Thank you.

(session completed at 6:45 a.m. CST)

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