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BREAKTHROUGH GROUPS ON SOCIAL CHALLENGES  
FUTURE WORK

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>> MARIE-JOSE BAHNAM: All right. Good morning. So good morning, everyone. And welcome to the future of work breakthrough group. My name is Marie-Jose Bahnam. And I am honored to be moderating this critically important session today. This is the first of four breakthrough sessions that will take place today and tomorrow. We will focus on the timely, fascinating and personal topic of the future of work.

Are the slides up? Thank you. Next slide. Perfect. Thank you. Yep. Okay. It is widely believed that AI will eventually be able to take on not only tasks that are simple repetition, engineering and teaching. As we heard in the last Plenary, we have become concerned with what may become of us if machines will take over our work. How will we earn a living? Will we need to earn a living? How will we make contributions to society and to our world? What if we as we are today are not qualified to compete with machines? This can be quite a frightening topic. But it does not need to be.

We are here this week to determine how to shape the development of AI for good. At this Summit we are doing the critical work of producing guidelines that will help us achieve

this goal of shaping the development of AI for good. In this session specifically we will paint the picture of our preferred future state of work and determine how we get there and identify the challenges we must address along the way to ensure that we reached this preferred future state. Most importantly we will spend the majority of our time leveraging this vision to develop a set of guidelines that shape the way we move forward from today. The future of work is an unknown quantity and it could be terrifying but it could be good.

Because of the urgency around this topic this is not a session for sharing opinions. It is a (audio cutting out) tall order for a 90-minute session but quite achievable given the group of experts with us today.

To identify our lofty goals in just 90 minutes we will begin with two lightning talks three minutes each to set the context followed by a panel discussion and will create draft guidelines. We will open the discussion towards the end for comment to the broader audience. And we will recap the output of today's session. This format is intended to capture expert opinions to formulate guidelines. However we do not want -- we do not -- excuse me, we do plan to collect everyone's input. What is not shown on the slide is after the Summit we will be publishing a report that we will include everyone's feedback. There is space in the app to provide feedback once the proposed guidelines are drafted and your ideas will be considered when formulating the AI for good guidelines report after the Summit.

We would also like to include in the report the extensive work of the panelists and that others have done in this area.

Now I would like to introduce our first of the two lightning talks which will be presented by Barmak Heshmat, a research scientist and cofounder of the Imaginarium of Technology. Please welcome Barmak.

(Applause.)

>> BARMAK HESHMAT: About the future of work you have to ask, you know, what are the industries of the future and, you know, ask some fundamental questions like who are the people of futures and what are they doing right now. So let's take a look at some of the visions of what are the industries of the future. If you may proceed to the next slide. So, of course, autonomous cars and autonomous transportation is going to grow more and more. And this vision shows actually, for example, an autonomous car that provides certain types of service. So the world of transportation basically will collide with the service providing businesses. So you may have autonomous cars that serves food in it as well. You may have a McDonald's car or Starbucks car. And this will create new types of job. Who is going to maintain and refuel the refridge in these cars?

A lot of things in the lab they will come to industry with the help of machine learning. For example, in the field of chemistry and biology there is experiments that can be made much more faster and much more efficient with AI. This design shows a device that can, you know -- very rare in production kind of process. But because it can scan these particles very quickly and uses machine learning it can actually tune in to very, very specific type of particle. Let's say a long carbonite and generate those in larger masses. You can find more details. You can read the details outside the poster session.

Another thing that you have to ask is who are the -- these people of the future. These people of the future are mostly younger. If you are talking about us we are going to be relatively old at that time and probably out of the job market. So these younger generation that will have notably different education system and education researches they might be assisted with kind of nursing robots that you can see, for example, on the left, that will amplify the learning process of a kid and the kid might have very highly specialized skills in a certain field but not skilled at all in other fields because he relies on the computers to compensate for that.

And this kid grows up their whole industry, of course, has changed. The idea of putting people in to buildings to do certain things has changed as well. So there is scattered offices around the world kind of following the model of Uber where they can go and work and have potentially paid subscribers around the world. So this whole idea of having a constant or kind of very safe and secure employment might be completely blurred in the future.

Now I don't have more than three minutes. So I'm going to close it with this which I call Maslow's shadowing effect. By looking in to industries and technologies I realize that a lot of the, you know, the technologies on top of it. So if you look at, for example, the shelf access which provided the whole resolution of Internet, all these apps and Internet websites they pretty well match the triangle of Maslow which is human needs. So you have physiological apps for food and then safety apps and then you have belonging apps like dating and Facebook. And as you keep, you know, having more and more advancements you can have more of advanced and complex apps for these kind of sectors of technology.

And AI is going to be no different. So you have another shelf that would add to these Maslow's triangle that would also have a shadow of this triangle on top of it. Right now we are at the age of autonomy. So we have a lot of industries being autotomized but after some time we will have more machine learning algorithms collaborating around the world on the

Internet. And we will have to develop the communication protocols of these algorithms. And so these are what I call AI crystals which means that these pieces of algorithms they cohesively collaborate together. And as we go further in to the future, we have something that I call AI organics which are similar to organic chemicals in chemistry. They are highly reactive and basically distributed -- distribute and solve more complex tasks. And after this, as you can see now we are going to -- of algorithms and softwares that survival skills. And if you keep going further and further up this triangle the probability will actually decrease notably.

So I believe there is this barrier which I call Rave on barrier or barrier of spirit. If a program basically goes beyond that barrier it will go toward being a super intelligent beam. The possibility is ridiculously low. What I am telling you here you either have microbes or microorganisms of AI and you have super intelligence. And most likely you will just have very specific microorganisms that survive for decades and serving humans, you know, good. So I'm going to wrap it up with that and go to the next speaker.

(Applause.)

>> BARMAT HESHMAT: Thank you so much.

>> MARIE-JOSE BAHNAM: Thank you. So thank you, Barmak. Could we have the slides back? Perfect. Thank you. All right. Our second lightning talk will be presented by Ekkehard Ernst. He is the chief in ILO. He will present on the implications of AI on the future of talent and management. And I will challenge you to maintain the three-minute lightning talk time. Thank you.

>> EKKEHARD ERNST: The title of the conference which is AI for Good and AI for good in terms of how can we make use of AI in practice in putting it in for benefits to develop -- I first wanted to start with the very simple statistics to show you where we should actually focus our attention. Can just put up the slides? Yeah. Thank you.

Now the point is that we are actually looking at the wrong place if you look at job destruction and job losses. What we should be more concerned about is the inequality that has been rising over the last 20 years. And it will continue to grow if you don't manage our talent properly. Now the idea of talent management is that, first of all, we have to anticipate the right skills that we need. And we have to see where we bring the skills together at the right place which means that we have to solve skills mismatches. For that we need a lot of data. Now in principle the data is actually available. We have a lot of data out there in the labor markets. ILO is collecting all types of publicly available statistics. They evolve constantly and they are using AI tools to collect information and process it. Much

of this information is not available for Governments unfortunately to access it and process it for talent management purposes. And this is the first issue that we need to tackle and that hopefully in the panel discussion we will find some ways of trying to come up with guidelines on how to regulate, how to manage these type of data pool that is available.

A lot of the data is actually available in forms that cannot be easily understood. It is not like an unemployment rate or a rate of how many people are in the labor market or the workforce. How many people are -- I have just shown you some really basic tools that even like people like me can use without any kind of special skills for that. But in order to be able to process this huge amount of unstructured data, we need AI tools that are currently being developed or under continuous development. A lot of these tools are not necessarily available for Governments easily. And private sector companies helping here to develop these tools more broadly. The point is that we need the data but we also need the tools to process them. Both of them are not necessarily available easily. That brings me to my -- sorry. I was a bit too fast.

Brings me to my last point. So we have to bounce some information but who can own the data. As you know a lot of us producing every time data by just consuming, by taking public transportation, et cetera. So we actually produce constantly data that is being somehow collected by private sector entities but not necessarily available for talent management and economic development purposes. In order to be able to have access to this type of data we need to find a way of incentivizing people to be continuously producing them but having public access to at least part -- talent planning and anticipation. Again for Governments are trying to put in place the National Academy of Science in the U.S. It has to be a collaboration between Governments and industries.

In addition to that these tools, these AI tools, these Big Data tools have the potential also to help us monitor and develop certain standards. As you know in our developed economies here we have a certain number of labor standards that are being implemented in a lot of Developing Countries and these are not yet available. And these tools help us to monitor, constantly progress that is being made and help us to implement and sanctify these standards. In terms of future work what is essential in bringing these tools up to a public use we can prevent skills shortage. And we can make sure that we anticipate properly that Governments especially in countries where resources are available, have the means to anticipate the skills that are needed and where they are needed. Not only in terms of broad competencies but specific skills for certain industries,

for certain occupations that will arise in the future. For that the important thing I believe is we need to have a public AI infrastructure that is publicly available for Governments but also for people. We need to have these tools. You need to come in to, for instance, the public employment sector services and have the possibility to actually use these type of tools to anticipate for yourself what kind of skills are needed in the future. A lot of infrastructure is available in developed economies, but for Developing Countries this infrastructure needs to be -- (no audio)

(Applause.)

>> MARIE-JOSE BAHNAM: Thank you, Ekkehard. All right. So we have got a lot of work to do in the next 60 minutes. So it is now time to begin formulating the important guidelines for AI for good. So please welcome our panelists. So we have got Ekkehard who just spoke, Irmgard Nubler, Olga Memedovic, Ratika Jain, Manuela Veloso and Dimitri and Stuart Russell. And we have our Rapporteur Alex Cadain. This will be different from a traditional panel. And I will be posing a question to each of you. You take one minute to respond and a few minutes of discussion and then we will develop a guideline to propose to the broader group. So without further ado let us get started.

Okay. So the first question -- the first question is to Ratika. So the new industrial revolution and progress in AI specifically will initially disrupt existing employment patterns as roles are redefined and redistributed between humans and machines. And this is leading to displacement of workers by machines and elimination of certain types of jobs. And it offers the potential for job creation which frees up valuable time and for higher and repetitive -- will not only translate in to machine versus human labor but increasingly in to machine and human labor. It will create new roles for people working alongside machines who are managing intelligent systems for maximum productivity.

Ratika, could you please paint a picture of what the best case scenario for the future of work could look like where humans are comfortable with the rise of machines?

>> RATIKA JAIN: Good morning. Thanks, Jo Jo. Change is that really in what I call the A cubed age, which is assisted augmented autonomous. And, you know, today these systems are really endemic to our existence to various degrees and all of which have opened a whole new realm of possibilities for society. And so the question is will this lead to dystopia or utopia for the future of work. It is not a 0 system game and not man versus machine. And there are a host of areas where we need to be able to develop solutions and quickly define a cure for cancer or to solve global warming. And that's only going to be

possible if we combine human cognition and intuition, human experience with machine memory.

So additionally the opportunity lies in new jobs that will get created with new solutions being byproducts of this process. We are already seeing this on the shop floor, in the health care space, where you are seeing, you know, assisted surgeries, assisted production techniques, precision engineering happening. You are seeing it -- that has managed to register more than a billion people, you know, and which is now being used to actually render welfare schemes to the intended recipients as opposed to it getting lost.

So the possibilities are really endless. I think undoubtedly the nature of work will change in this process. In India we see umpteen examples that people at the bottom of the pyramid are able to identify unmet needs and bridging this gap by providing a host of personalized offerings and creating scale. We have seen telecom was one area within a decade we saw telephone density going from less than 1% to 60%. And new services being provided where fishermen used their mobile phones while at sea to understand which is the most remunerative landing point to sell their haul. We are seeing companies today using -- this change that is really before us. And, you know, I would say we need innovators, inventors, industry, think tanks, Government, academia. Agree on what is the ideal state that we want and ensure readiness for the new society that it is emerging. I think fostering adaptability in our society is going to be key. And this is where in AI the opportunities, the challenges learn from each other so we don't make the same mistakes individually. And, you know, I will end by saying and I am kind of reminded about what is alluded to Charles Darwin in species, it is not the strongest that survives but the species that survives is the one that is best able to adapt and adjust to the changing environment in which it finds itself. Thank you.

>> MARIE-JOSE BAHNAM: Thank you.

(Applause.)

>> MARIE-JOSE BAHNAM: I would like to ask does anybody on the panel want to respond to that? Have another comment? Yes, please. Mr. Dimitri.

>> Dimitri from Bulgaria. Just to make some additional points. Yes, there are a lot of jobs that I believe will be lost but also there are jobs that will be shifts in a way. And also new jobs that will be created and I don't know what is the real sum of that. What is the visual -- it seems to me that it is a lot of forecasts going differently. For example, the Oxford University 2013 focus for medical labor market showing that 47% is under danger. And other surveys are 9 to 10%. It is clear that the new jobs will appear. And I will mention three

categories of three jobs. Trainers, this is one of the new brand let's say, new cluster. The people have to teach the AI systems how to show compassion. And for those guys that don't need a college degree the forecasts shows that this actually Amazon Alexa. Next new set of jobs will be people, will be explainers between the technologies and the business leaders. To understand what is going -- what is happening actually and the nature of sophisticated machine learning algorithms. And the third one is going to be sustainers. A kind of complaint managers will act as watchdogs and Ombudsman for upholding norms and values. And this is going to require a very high valued -- sorry, advanced degree. Just to end up, one and two I think mean the trainers and explainers is going to evolve from the blue collar workers to the new collar workers that they name it already. Is that the real future that we are going to see? When I come to my panel I will talk about the (inaudible) not only rosy future.

>> MARIE-JOSE BAHNAM: Thank you for that perspective. I would like to ask Ratika if you wouldn't mind providing us based on this discussion, I know you had thought about what guideline would be proposed, but based on subsequent discussion what would you propose as a guideline that we should be thinking about as we develop AI?

>> RATIKA JAIN: Yeah. As I said, Jo Jo, I think what we need to look at is creating a shared understanding of what our end state is going to be. We need to look at -- and based on that really determine what are the elements that we need to then work towards. Otherwise what's happening is that we can probably really get lost in the possibilities and I think just -- (audio cut out).

>> MARIE-JOSE BAHNAM: Thank you.

>> (Off microphone).

>> Press the button.

>> It is off.

>> It is blinking. I was thinking about these breakouts, how is this going to be productive in 90 minutes and -- (audio cut out).

On a timeline tell me, these are the jobs that you expect will be disrupted by AI and these are the new jobs that will be created by AI. And if we settled on that and it had geographic implications it is for certain regions of the world this is what you should plan for, because then at least educational systems can build a curriculum towards that, right? And the world could at least start to have a knowledge and exposure to understand and to start to telegraph what's the training they need because I don't think that people really understand that. And there is no authority to source on that topic.

>> RATIKA JAIN: I would say I am partially alluding to



that, but I would not like to predetermine what those jobs could be. One thing one sees there are a lot of individuals who would create new opportunities. And I think therefore it is important that our societal ecosystems create kind of an enabling framework. One thing that comes across consistently we need to create constant learning platforms and just creating and embedding that in to how societies are evolving would prepare communities to -- and these are the opportunities. You will see -- people tend to become fairly focused and some of the other opportunities get lost. And the sweet spot is in some of those other opportunities. That's the only concern I have and defining specifically, but undoubtedly I think having, you know, the UN and its agencies kind of come together with the stakeholder group to try and say this is what the trend seems to be. Let people also kind of assimilate and make some sense of what that noise is.

>> MARIE-JOSE BAHNAM: I believe that Irmgard would like to comment.

>> IRMGARD NUBLER: I cannot resist. I'm sorry. I think what you expressed is a rather deterministic perspective. You know, when we talk about the impact of new technologies and jobs we are always quite clear about the fact that jobs will be destroyed. And then we have a whole bunch of studies which tell us yes, you know, these famous, which is a technical study, what could be feasible. They don't discuss the economic impact. The jobs will not be destroyed when wages are low enough because the new technologies is not built up.

So -- studies on which jobs are destroyed and when. I think the real interesting question what about the creation of jobs and where will these jobs be created and will be the process. And I'm proud to say I just published a paper on that. And I did a major effort to look in to different economic theories and like the evolutionary economics. There is a wealth of information about how change processes are nonlinear, dynamic processes and there you see that in the -- you can learn a very important lesson from the -- from the past from history. Whenever you have these major waves of technological change and we are currently in such a major wave of change then you can see that after phase of job destruction, which is large and driven by process innovations, you are coming to a phase where, you know, because these -- this phase creates many intended consequences, like productivity increase and job loss because this is how we increase productivity, but we have many unintended consequences.

Inequality, disruptive -- disruption of societies and disruption of our environment and societies respond to that. We tolerate such effects for awhile but at one point societies just

don't accept to be destroyed. So at one point they respond. New social demand and new political demand. And this has always created a phase of development of fundamentally new products, new industries, new consumption structures. And that was achieved by major movements, social debates. The trade union movement in the 19th Century was because economies, the German Economic Association was created as a result of that debate how can we improve the situation, working condition of workers in the 19th Century. Academics took initiative and the Catholic church we have -- and when you look at the debate now then you see we have COP21 and we had in 2015 encyclica of Pope Francis with major, major messages on technologies.

The role of the state in shaping the future, in shaping innovation, so what I want to say is I think the idea that we can foresee what will emerge, this is -- I mean it is -- I don't think it is feasible. But what we have to develop a huge trust in societies that we -- that these jobs will be created and think about how Governments and societies can support this process of shifting in to a new phase of innovations and product innovations, but I don't think it makes a lot of sense to try to forecast, foresee where these new jobs are created and what skills they will need. That I think it is very deterministic. And I think this whole idea of skills anticipation in a time of rapid technological changes, anticipate fading skills needs, I don't know. Thank you. I'm sorry.

>> MARIE-JOSE BAHNAM: Thank you. One more comment and then I would like to actually circle back on something you just said, Irmgard.

>> STUART RUSSELL: I like to sort of maybe chart a middle road between what Mark is saying and Irmgard are saying. I think there is elements in both. If we have at least a qualitative high level vision of what's the desirable future that we aim for, then there are policy steps we can take now. I think it is going to be hard to predict the nature of jobs but you can see clearly that the physical labor of humans has already largely been eliminated.

The routine mental labor of humans is going to be eliminated. So what's left is primarily what do people have to sell if they don't sell physical and mental labor. We have revolutions before and everyone is fully employed afterwards. There is only a finite number of things that humans are capable of. I think what's probably going to be left is we are humans and as humans we desire the presence of others. If you had to predict what are the jobs going to be in 30 years' time it is not going to be a billion data scientists or a billion robots. It is probably going to be a million of each. And that's a completely different kind of education system. It is a completely different kind of

economy where most people are self-employed and will require very different skills from, you know, just more STEM training which is what most Governments seem to be thinking about.

>> MARIE-JOSE BAHNAM: Thank you. So given that, Irmgard, I wanted to turn to talking about preparation now. In your research how do we make sure that humans will be prepared for what we think might be the future of work?

>> IRMGARD NUBLER: Thank you. I gave part of the answer already. So I maybe not need so much time. First of all, I would like to take this opportunity to talk very briefly about the future of work initiative of the ILO.

I think this is very interesting to maybe share this information with you. The ILO is -- is having its Centennial in 2019. And in preparing for this event the DG of the ILO decided three years ago to launch an initiative on the future of work in order to start a global dialogue on how this future of work should look like and how Governments, social partners, academics, enterprises can contribute to shaping this future. And we see this event in that context.

About your question, as I mentioned I think we know -- we have a very good idea of how -- what kind of jobs will be lost. And it is much more complicated to identify the skills which we need for the future. And I think that is -- that is one important element of preparing for the future of work. We are trying to identify what kind of skills would be needed. And I don't think that -- as you said I don't think it is trying to forecast technical skills. Because that may well depend on the type of industries that will develop. I think what is -- we have some idea about these type of skills we would need in the future. For example, one is workers and professionals working with Artificial Intelligence with machines. Machines will eventually take the -- have a high level of tolerance for ambiguity. Because you would then have to be able to accept the decisions which machines may take. So managers in the future they will tell them the algorithms, the level of risk they want to take.

But the machines will then take decisions. Other important insights I think is in the future we will have many more hybrid occupations. Occupations which combine very different skills and competencies from many different knowledge domains. When you are, for example, developing algorithms in the law, in industry you need to know about software, coding, the law business, about the data architecture. So we -- I think that is something we have to think of what kind of new hybrid occupations may we need in the future. And there is something else -- attitudes of a society. The shared belief and knowledge system of a society are very important for the dynamics of structured transformation and development of new industries. And the shared knowledge systems

are very important also to -- they need to change if societies want to move in to new industries. For example, we are talking about the green economy and -- that we need to develop new industries, new demand structures, and new consumption structures. And that requires, of course, a change in mindsets of people. And in that sense that is for me also a social collective competence.

So I think it is important not when we talk about skills and competences. Not all talk about the technical skills of an individual. So I think that is something policymakers -- policymakers need to understand an inference in to shape if they want to promote the adoption and the capacity of a society to absorb Artificial Intelligence technologies. Thank you.

>> MARIE-JOSE BAHNAM: Thank you. Professor Manuela Veloso, would you mind commenting as well? I know you can bring a different perspective to this.

>> MANUELA VELOSO: Yes. So I think that following up on the excellent presentations of these optimistic view of what's coming up, I really think that what we should think is that if we enable humans to understand more of their round discoveries in the sense that this is an eye and this is robotics did not come from the sky. It was actually invented by us, by humans, that there are no limits in what humans can imagine that they can do with these discoveries. From walls that can move by themselves and new architectural kind of way of thinking about life, from data that can be collected and used for all sorts of like things that humans may need, from simulating the human body so we can actually do Alpha Go to cure cancer one day. So what I think is that going back is that I trust so much the human mind to actually create these amazing new ways of looking at what technology that they invented can change the world. And I believe that it is not just going to be about your personalized kind of like talents and make them valued for the societies.

That we are going to be able to work together on redesigning maybe the physical space. Data space. So I really think that we are well enabled to foresee what these humans can imagine. But so this is my first point is that I am extremely confident that the number of jobs, the type of jobs, creativity humans will have with respect to their technology is going to be fascinating. And our role today is to enable people to know that the technology exists and to form more and more children to form more and more Ph.D.s on really enhancing these technologies from a hardware point of view, from a software point of view, from an algorithm point of view, from technologies rather than just using the technology to really mail or just using the technology to do a Google search. There is much more that this technology

will enable humankind to do.

The second thing I want to briefly mention is like this. Imagine when the cars were invented or imagine with any technology was invented look at the infrastructure that comes with the technology. The mechanical cars, the ones that invent new types of rubber for the tires and I believe our technology will enable jobs. There are for maintaining these computers, maintaining these hardware, inventing the new sensors and coming up with new ways of actually having our materials, our design coming up, it is all about creativity now with another level. When I look at this room, because I'm in this mobile robot point of view I always think why -- and that takes a lot of work and a lot of jobs to make that thing happen. We should actually have a way, we all stand up and leave and we press a button and the chairs magically would all go to their right position next to the tables or maybe all disappear and go somewhere else. We are going through these technologies to enable the creativity of humankind to be well beyond what we can imagine today.

And that will mean many jobs.

>> MARIE-JOSE BAHNAM: Thank you very much for that perspective. I appreciate very much the optimism. It is important. It is important. So Ekkehard, I'd very much like for you to comment if you wouldn't mind on the opportunities of risk and on human talent as we move forward.

>> EKKEHARD ERNST: Thank you. I wanted to make a quick comment on what was said before. I would be very -- more very -- for technological change rather than too much. For the moment that's why I showed the picture at the beginning. The job destruction rate is falling. The change on the labor market towards new opportunities is falling. That's what my point was we need to match new skills and the emerging possibilities with existing people. Just to put this in perspective maybe, one point on the current labor market we educate, most other people are doing regular jobs and for these people we need to -- arguing for us that we need to -- we need to have all the information that is available on -- currently out there. Public -- public statistics, officially available statistics are not sufficient for that. We need to have access to a lot more information.

So my argument was and I think the challenge currently is that how do we get access to that information. How do we see what's happening on the shop floor, not only in Google but at Wal-Mart. If we don't get that information, it will be hard for us to anticipate skills but reorient the other 60% of the workforce. So I think if anything what UN -- what UN agencies should do, should argue in favor of, for instance, setting -- helping private entities to set certain standards in how do we classify

jobs and advertise our jobs and then helping or promoting regulation that would at least give access to a basic infrastructure both in terms of data but also to -- process this data so that these other 60% of the population can actually also have access to information and to the possibility to reorient themselves because that's what's going to happen. If we have these rapid changes we need to make sure that the -- these other 60% have that information, can reorient throughout their lifetime and career and maybe go in to personalized services rather than trying to find another job in retail or in hotel.

I think that's the important challenge to get access to the information and to have some kind of basic tool for Artificial Intelligence so that the public entities, public institutions can help and support that transition. That is for me the most important challenge that I think especially in international bodies like ITU and ILO can work together and promote certain standards.

>> MARIE-JOSE BAHNAM: Thank you. I'm going to keep moving us forward as we have got 25 minutes left if I am going to try to end on time. So Olga, just to get to the question. How do we mitigate the risks that we have been hearing about, completely -- I mean completely replacing humans with machines?

>> OLGA MEMEDOVIC: I think -- does it work? Okay. Thank you very much and happy to be with you today and this afternoon in this panel. And I enjoyed the presentation of today. What can be an action plan for the future? As of now ten months ahead and to understand what is going to happen in terms of future work by sectors and by activities in sectors and by countries, location in countries and what we can do about it. So let me put Artificial Intelligence in the context of global industry today. As we all know globalization of industries is an ongoing process since the 1980s. And Artificial Intelligence is no excuse. The Artificial Intelligence value chain is also global. And it is based on global innovation network. On research and development is also global. And we have witnessed the research and development innovation network in semi-conductors and microchips and super computers. So what will happen with the countries which are not participating in these processes? So let's say that the Developing Countries are not taking part in the Artificial Intelligence value chain production.

That's one dilemma for Developing Countries but also for global community. Whether these countries will be able to achieve Sustainable Development Goals. If we are going to witness Artificial Intelligence adoption in globalized industries and in traditional industries particularly like we heard the automotive industry but also industries such as a letter, textile and clothing and food processing and if

Artificial Intelligence is taking place in these several activities or all activities in the value chain on these traditional industries what Developing Countries will witness, particularly those that are integrated in these global production systems. So they will witness loss of some jobs in some certain tasks of this production value chain because this let's say low skill intensive task or jobs as we heard they will move back to the countries, Developed Countries and increased demand for the skills, high skills and they will be demand for those jobs in Developed Countries.

So what Developing Countries should do under the circumstances? This very much depends on their knowledge skill base, digital knowledge particularly. Then also their infrastructure capabilities and connectivity, digital connectivity. Then also their regulatory aspects, that means they are capable to collect all these data Big Data system and to analyze them, do they have a statistical knowledge base and capabilities. And the third one is to also understand these processes and how to adapt very quickly to these situations that some tasks will be let's say in short to develop some countries but some tasks still performed in Developing Countries but they need to be retrained and who is going to have them. I think the best -- (no audio)

Countries can really be marginalized. And we can face a lot of big challenges that means more migration from Africa. For example, which have a lot of demographic issues. That means the young population is growing fast. And if these labor intensive jobs are going to move again to the Developed Countries they will be really marginalized.

And the third aspect that I would also like to mention that it is, of course, the challenges how to do this scaling or improve your skill base but the other one is how to leverage these new technologies and if possible, help the countries participate in the industrialization processes at a global scale. We could see again premature industrialization in some countries will lead to higher poverty, not realizing SDGs. And we have to help these countries and how are we going to help them. To understand fragmentation of production value chains even in Artificial Intelligence what task requires what knowledge base and whether this knowledge base existing in different countries. And if it does not exist and then what we should do to improve their knowledge base. And with the help of Artificial Intelligence, this global knowledge base will be restructured. So which means that we will see that more knowledge base embedded in machines will be concentrated in Developed Countries. No knowledge base whatsoever. What we are going to do as you mentioned earlier if you are going to do mapping of industrialization -- because

production value chain is very fragmented today. And if it is fragmented based on division of labor and how you are going to integrate this, distribute the knowledge base and this is the critical issue.

I will give one example. This is China and also Artificial Intelligence in China. China is trying to catch up very fast in Artificial Intelligence. So some -- on some task in Artificial Intelligence they are very import dependent and then want to be independent on that. So they are investing a lot and creating systems and incentives to invest and do task of Artificial Intelligence value chains so that they are independent. And this is super computers and semi-conductors and graphic design processing and who are leading in this task in artificial and who are investing in upstream work. China, United States, Germany, United Kingdom they are dominating.

Where is the place of others? So I think we should also think along these lines when we are thinking about future work. So what will be the task for the global community to contribute to the creation of Artificial Intelligence and also how to leverage opportunities of Artificial Intelligence for the benefits of all. Thank you.

>> MARIE-JOSE BAHNAM: Thank you. Mr. Dimitri, I would like to ask you to also comment on this and in addition to sort of how do we make sure that we do -- that we mitigate the risk of inequality generally speaking, not just necessarily in developing versus Developed Countries.

>> Dimitri: Yes. The nature of this -- (audio cut out) especially in the developing world as mentioned already, and the more displaced and discouraged people ever before. This is my focus as I said.

(Audio cut out)

>> Dimitri: Jobs, but meanwhile we have to think about how it is going to share this around the globe. And my first question that we have to ask ourselves who owns the machines and algorithms and data. So all these technologies are owned by few people. And I'm not against private sector, not at all. But it seems to me we have to speak about something much more in deep transparent. So -- and that second question who will be the winner and loser. We see that the winner describing 'til now the loser start to appear from the developing world but also loser in traditional part of the world as well. For me it is really important to address the key issue in that. It is the governance issue. The governance issue across the world is global governance infrastructure and international organization delivering trust and transparency and equalness through dialogue. For me I am not so aware about the human wisdom. As was said here that the human wisdom will lead to the eventual



limits of those Artificial Intelligence development that would harm in a way humankind. A certain extent of the development of the future.

So it seems to me that we have to impose these limits through collective globally agreed framework and, of course, this is the political job for all political leaders across the globe.

The second issue that I said the guidelines would be transparent and democratic shareholder structure of those that own the technologies, data and algorithms. So I really need this to be discussed here. And I believe it is a crucial one. Maybe the last one, fair distribution of all these profits of gains that we will experience and will foresee, and after all this productivity moving in Artificial Intelligence but also the technological revolution outcomes that we are going to share. In this respect the institutions, strong public institutions, public authorities at the national level but also the strong constituents. Business and workers should be going with academia and public authority to shape up the future of work, and all this uncertain jobs that we have to describe for the developed world and to fix up the dilemma of the fairness of the investments and also the distribution of wealth among the developed and developing world. And more public sectors jobs have minimum wage and (inaudible). And the last point maybe which is discussed a lot during the last 20 years, universal basic incomes. Different schemes that could be secure as substantive incomes for all of the humans in this new era. So it seems to me that it is achievable but not as a panacea for curing all the problems that we describe now but as a first step to secure all these distributed profits will reach everyone in this planet with universal basic income. It is a good result and then to free the opportunity for all of those guys to short creativity and to do what they want and not necessarily produce market but to produce for human asset or going in deep in the human nature. Psychological start to study ourselves. We don't know what's here in our brains. A lot of challenges that have to be addressed if the people don't think every day how much they should work to make a living. Thank you.

>> MARIE-JOSE BAHNAM: Thank you very much.

>> Dimitri: Last point, the juxtaposition strategy in this line is especially important and there are a lot of discussions between the employers and unions at the global level how to put this juxtaposition funds, to manage all these outcomes or let's say challenges including the universal basic numbers or issues set for distribution.

>> MARIE-JOSE BAHNAM: I want to make sure we take two questions from the audience before we summarize our findings today. And then from that we will be able to formulate the

guidelines that we will propose for the broader publication. Thank you for all of your input today. I see a number of hands. So up here. Yes.

>> Hi. My name is Amerca. I am from the Czech Republic for good AI. I am an advisor to the Prime Minister's office and an advisor to the secretary of education. I have a comment. We discussed with Markus after the dinner yesterday that the technologies and businesses they might be very fast. They might be disruptive really. But for the societies it takes much longer to adjust. So this is a fact we know that there are people in it. There are institutions involved. They have lots of vested interest, et cetera, et cetera. So this takes much longer to adjust to any technologically enabled economic and business disruptions. What we can do in the short term is I think very much what Ekkehard is suggesting, make available the data. So make sure that everyone not just the governments, but every individual globally has the data available. As we discussed yesterday there will be much higher connectedness of individuals.

So we will have maybe 7, 8 billion people connected to the Internet. If the data is available and it is free of charge, the people can take the advantage and adjust themselves quicker at the individual level.

In terms of this takes me to the second point is I think we need to distinguish the time periods. We kind of discussing several time periods here which are -- which often are not very useful to do. So I said in the short term we can do the information, availability, in the longer and very much agree with -- we should be thinking about the future that we wish. So about thinking about different -- about the future what we would like to have and this in the longer run. We don't need to distinguish the time periods quantitatively. No one wants to make the guesses and we want to maybe distinguish them qualitatively in terms of technology changes. And we should be thinking not just one future but kind of in scenario planning. And this takes me to the last point. This will help to increase trust and credibility of both businesses.

>> Thank you. My name is Anshu. I'm from C Step, a think tank based in India. My question is regarding the -- yesterday we heard a lot about the exponential growth and how businesses and governments will struggle to cope. In a country like India with a population of more than 1.2 billion and 40% of that is below the age of 18. Imagine a half billion kids will be in the job markets, 10, 15 years from now. What would you advise for the policymakers for the kind of job market that will be ready for 10, 20 years from now? And the education system in India today is towards a certain kind of manufacturing jobs and also

jobs in the IT sector. How should the education system respond to this, to what lies ahead? Is there a need for as Markus mentioned some very high level studies which either qualitatively or quantitatively try to pin a future of what might unfold ahead?

>> I think the last two questions, scenario planning definitely for people that know scenario planning as a profession, scenario planning is what is happening. I do think that you can predict those jobs. You can work with CEOs of the organizations. They look at AI and how to go through the attrition rate on the labor force to not have to replenish the workforce. A big retailer they are premeditating the job loss that is going to happen when they automate those jobs. The UN can take a role to start looking at those business plans because they are already being put in place. And you don't need retail. And training retail you need to start -- if you want those future jobs get in to virtual reality.

In India a lot of young people do retail. You can put together a map of what is going to happen to that industry which is currently a major employer globally and with AI you can look at what jobs are going to go away. Those business plans are actually being put in place. The UN could be the aggregator of that to have some understanding of job loss that will take place to replace those jobs with AI.

My son is in college and he is taking virtual reality classes because I told him that's what he needs to learn. You can start to put together these are the types of jobs that will go away based on what is it going to happen with industry. I think a little bit can get done by the UN chunk by chunk and you -- it is a crawl, walk, run in to what the UN can do. And I think they could have a role to convene that dialogue to try to put a map and do scenario planning in the future of retail, the future of education, the future of learning. That's happening already. Nobody has exposure to them. I think that would be extremely helpful at least as an initial step was my original point.

>> MARIE-JOSE BAHNAM: Thank you. We have time for one more. So I'm going to go --

>> I am a professor of AI at the University of New South Wales in Australia. Something that Stuart said, there is almost an infinite number of jobs in health care, aged care, and education and support them. Are you willing to share the benefits that are coming from technologies around our societies to support those sorts of jobs? There is never going to be a lack of jobs. It is just whether we are going to adjust our society in the right way for them.

>> STUART RUSSELL: Yes, so I think there is a question of distribution, but there is also a question of productivity in

those sectors. The quality of work that's produced. So take, for example, the care of very young children. This is potentially incredibly important to the quality of life of human beings. If you have a childhood that's stimulating and emotionally supportive and your life could be much, much better but we have no idea how to do that. I tried -- I have four kids and I am a complete failure. You can buy 100 books and they all tell you different things. There is no science base for how to do many of these tasks. Until there is it is unlikely that we are going to want to allocate a large part of our GDP and pay high hourly wages to a sector that's producing very poor quality outputs. So this is a very important thing that we need to invest in right now.

>> (Off microphone).

>> STUART RUSSELL: Right, but until we do it well as I say we -- right now we have elder care workers and we pay them minimum wage in most countries. It is not a high --

>> We can make a better choice. There will be more of us getting older.

>> STUART RUSSELL: It is not just a choice. You might say well, we just choose to pay management consultants \$500 an hour. It is not a choice. Presumably in some theory or sense they are worth it. And that's the important point. You have to improve the quality of output, the value generated before you are going to see those kinds of jobs having high wages.

>> MARIE-JOSE BAHNAM: All right. Thank you very much. So we are going to take this last minute Alex who is going to summarize for us what we heard today and then we will break for lunch.

>> Alex: I will try to sum up what we just heard and maybe it can open to a final question on the different guidelines that we will have to present this afternoon. So we have had the chance beyond let's say the usual fears and dreams that we have regarding the future of work. To have today let's say a realistic view of what's going to happen and, of course, we have been talking about jobs that are going to be replaced by machines in repetitive tasks but also in let's say higher intellectual tasks and creation of new jobs. I will be quoting some. I'm sorry I will try to go fast. I won't mention you. About trainers, explainers, sustainers and the idea that us humans have to actually work on this creativity, that we have to imagine future jobs and we understood what the future is about is not a 0 sum game. It shouldn't be man versus machine competition.

There is an opportunity to design new ways for collaboration and address challenges. This is the reason that we are all here together today. The main reason I feel most of us are actually

optimist about the future we tend to believe that humans have the capacity to adapt to new changes. And so the truth is that if we want to adapt to this new context, we want to make sure that the new generation is able to get the new -- these new competencies and skills.

We mentioned tolerance for ambiguity and adapt to the hybrid occupations we have and this idea of facing inequality within countries and in between countries from the developing and the developed -- seeing that for now private users have an advantage in making use of this data for HI and business planning strategies but still potential benefits in policy making and implementation that remains underexploited and guidelines towards institution that could help private actors to set standards and how we can clarify and advertise these new jobs. And then an idea again on how we can actually help those Developing Countries to make sure that they, too, benefit this actual revolution. And we have had this idea to think, make sure that they can access digital infrastructure, maybe that the private sector could actually help and train on different job forces. And the idea of creating incentive to business, so that they can actually train those local populations.

Then we went to the idea and maybe finally of making sure that we are not actually going in a world that is getting to further divisions. And how we could actually mitigate these risks. So smart machines as we also today are indeed able to perform an increasing number of tasks but the question remains who owns actually these machines. If we look closer they actually belong to few people is true. And how will we make sure that we can actually distribute this kind of benefits. So there was mention of the idea of having like a global social gala that is instrumental on the national and global level to help managing this transition that we live in and also we heard from the audience the idea of making sure we have strategy on short term. And we can adapt and the long term that the future we are building is the one that we want. So I guess now what we have to do for the beginning of this afternoon is to try and tackle three main guidelines out of this. So we will be working on this during lunch. And if some of you want to just come and tell us what you didn't have time to do it would be an honor to have your advice. Thank you very much.

>> MARIE-JOSE BAHNAM: Thank you, Alex. Thank you, everyone. Bon appetite.

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