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WSIS FORUM 2017
JUNE 15, 2017
9:15 A.M. CET
SPECIAL SDG9 SESSION

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>> Good morning, Ladies and Gentlemen. If I can please ask you to take your seats, we will be starting in the next two to three minutes. Thank you.

Dear guests, Excellencies, Ladies and Gentlemen thank you very much for joining us here this morning. On April the 25 just seven weeks ago ITU and UNIDO signed a Joint Declaration on the advancement of 2030 Agenda for sustainable development with a particular focus on SDG 9 which looks at industry, innovation and infrastructure. This is intended to be an action oriented partnership leverage the complimentary capacities and mandates of ITU and UNIDO with an emphasis on concrete contributions to country levels towards achieving SDG 9. This new partnership was directly led to ITU and UNIDO co-organizing this special session at WSIS focuses on SDG 9. This will look at a variety of interrelated teams linked with SDG 9 and will include high level representation. The different segments of this special session will cover themes such as new investment and strengthening partnerships, ledge digital transformation for sustainable development preparing for the fourth industrial revolution and how to ensure success at country level including the essential steps for successful action. In brief we are looking at many words beginning with the letter I. Investment, infrastructure, industrialization,

and innovation. So without further ado to get us under way it is my great pleasure to introduce the Secretary-General of ITU Mr. Houlin Zhao to deliver his keynote address.

>> HOULIN ZHAO: Good morning, dear colleagues. It is really a great pleasure for me to join this session. It is not the first session for me today. It is the third session. I already joined breakfast session, one of sessions in between and now this is my third one. I'm glad to see many of you here with us. So on behalf of ITU and UNIDO and all WSIS partners I would like to welcome you to this session focusing on the key pillars of SDG 9, infrastructure, industrialization and innovation. The WSIS Forum consistently highlights the contributions of ICTs in achieving the SDGs. I think we heard voice everywhere. And without ICTs none of this SDGs could be achieved. So this is an idea, please, to have our first collaboration for the new ITU and the UNIDO partnership. I highlighted the public collaborations, things we have some coverage not to the public yet but anyhow, let me give you a one example. That at the World Economic Forum in January of this year ITU organized together with WSIS a special session of broadband commission, sustainable development and I invited a few of my UN colleagues to join me. And Secretary-General of UNIDO Mr. Lee young came to our session, particularly came to our session and he came to our session just two hours before he landed at airport. And then after our session left back to Vienna. He came particularly to join us to support the broadband commission's activities for Sustainable Development Goals. So we are very happy to have him, of course, together with some other UN agency heads putting the head of UKU, head of UNDP, the head of UNESCO, the head of UNWOMEN. And we are very pleased that that session focused on ICT, the other sectors to achieve our SDGs.

However this session at this WSIS Forum 2017 is the public collaboration to work together to address the important issues on SDG 9. So UNIDO is expertise in industrial innovation policy and ITU with expertise in ICT, innovation policy at the real energies for developing ICT ecosystems and already have a long-standing relationship. My dear friends, Mr. Lee young the DG of UNIDO signed on the 25th of April a Joint Declaration with the focus on the 2030 Agenda for sustainable development, especially SDG 9. Suppose ITU and UNIDO SDG 9 is of paramount importance that we leverage our core competencies to maximize our unique contributions to the UN's efforts to achieve the SDGs. The partnership between ITU and UNIDO has the goal of developing innovative business models for collaboration, leveraging multi-stakeholder resources for

concrete contributions and Mr. Lee and myself would like to see concrete results. And to see concrete results soon. Sooner rather than later. The aim of this partnership is also to engage all stakeholders so that together we can advise achieving SDG 9 and contribute towards achieving the other SDGs. SDG 9 connects between ICTs as endeavor to all SDGs and SDG 9 an enabler to ICTs. To ICTs are already empowering feelings of industry individuals around the world. But more than half of the world's unfortunately still offline. So developing infrastructure is essential to meeting this challenge. Access to ICTs is development indicator and aspiration. And UN Georgia Resolution A/70/125. ITU is the facilitator of action line C2 of information and communication infrastructure. Innovation can accelerate the achievement of the SDGs. And I am very pleased to share with you that new Secretary-General of United Nations Anthony Guterres his own interest and support to the innovation. And he consider innovations and new technologies as a frontier for United Nations. And he himself called me several times to discuss how can United Nations to work with the industry to facilitate the inknow voigs, facilitate the new technology development. Last week here in this room, I mean in Geneva organized our first Artificial Intelligence Summit. And I have 20 UN agencies come to join us. United Nations Anthony Guterres give us video message. I am pleased to note that UNIDO was one of those active contributors to the Artificial Intelligence. We organized together a session at that Summit.

And indeed innovation is quite important. But today the innovation is not necessary to come from the big companies. We note that many SMEs, small medium size entrepreneurs they are full of innovations and the SMEs are everywhere. So we worked together with our Member States to facilitate development of SMEs and with United Nations I myself talked several times with Mr. Lee young of UNIDO to see how can we work together, to facilitate the development of innovation, development of SMEs and we will further discuss the areas we can pick up such as some areas, some regions, some countries as our yesterdays and we go together to these countries to look for opportunities to facilitate industrialization of the nations, facilitate SME development and some other opportunities.

I'm very pleased that such kind of cooperation ITU and other UN agencies -- developed our cooperation with FAO, UNESCO, with WHO, and we are also working very hard to try to use our cooperation with the World Bank and any other UN agencies. In particular those agencies based in Geneva which help us to

facilitate the agreement and action. And in addition we also strengthen our cooperation with the World Economic Forum and other organizations to how can we work together to facilitate achievement on ICT and how can we encourage mobilize our partners to join forces to work on the ICT for SDGs. The role of ICT at SDGs is much more focused by our WSIS process. So ITU has been developing a roadmap of how the activities in all our three sectors, radio sector, innovation sector and development sector may contribute to the achievement of SDGs. We are linking our activities closely to our ITU strategic time and strategic budget that Connect 2020 agenda. And to the WSIS Action Lines. So WSIS Forum is the world that's leading ICTs for development event and we started this Forum from 2006 to 2015 United Nations review process to see if we should continue this process and ITU closely worked with the other UN agencies to convince our United Nations members to let us continue. And I was very pleased that at their view process in New York December 2015 United Nations General Assembly made a decision to encourage us to continue the process for another ten years. So I am very pleased that this WSIS Forum is able to continue. And I firmly believe that this process will help us reach ICT as an enabler and to encourage the multi-stakeholders to focus on ICT infrastructure development, innovation development and business development.

So Ladies and Gentlemen, I would like to conclude my remarks to once more again to thank UNIDO to come to join us to organize this event. And to thank all of you to come to this session, to address the SDG 9 and we should try to work together to train the opportunities to reality, that the full potential for our ICTs be achieved and the people in the world will be beneficial for the new technologies of ICT that bring to us. I wish you very successful session and unfortunately I have to leave you now and I think that my dear colleagues from UNIDO and the other organizers will bring this session to its conclusion. I thank you very much.

(Applause.)

>> Thank you very much Mr. Houlin Zhao for those very comprehensive remarks in your opening keynote address and for setting the scene for the special SDG 9 session for us here today. So central to any discussion about building out infrastructure ar narrowing the dinl tal divide is a topic of investment. Who pays? What new models of investments or partnerships are needed to deliver the infrastructure for the 21 century Digital Economy? Few organizations are better placed to shet light on this question than the World Bank.

Ladies and Gentlemen, please join me in welcoming our guest speaker Mr. Jos Verbeek the World Bank Special Representative to the UN and the WTO in Geneva.

(Applause.)

>> JOS VERBEEK: Thank you very much. I would like to thank ITU and, of course, UNIDO for this initiative and for inviting the bank to contribute to this timely reflection on the relation between technology innovation and sustainable industrialization. And its impact on economic growth and social prosperity of countries around the world. It might be good to remember what SDGs actually about. Maybe I talk here to the converted and the people who already know but I very often find out that people realize what a particular SDG is but they don't know what the detail is all about. So SDG 9 focuses on building resilient infrastructure, promoting inclusive and sustainable industrialization and foster innovation.

Consequently SDG 9 encompasses three important aspects of sustainable development, infrastructure, industrialization and innovation. Infrastructure provides the basic physical systems and structures essential to the operation of a society or enterprise and industrialization drives economic growth. Recites jobs opportunities and reduces poverty, advanced technological capacity of industrial second tore and prompts new development of skills. I will try to focus on the -- and discuss some initiallingtives the World Bank Group has taken and the imporngs of partnerships to deliver on the SDGs in general and on SDG 9 in particular.

A few words about the importance of digital technologies. I might be talking to the converted but it might be nice to put some of these things in perspective. Digital dividends that is the broader development benefits from using these technologies that lag behind. In many instances digital technologies have pushed growth, expanded opportunities and improved service delivery. Yet aggregate impact has fallen short and seems unevenly distributed around the world or even within countries. But digital technologies to benefit everyone everywhere it requires closing the remaining digital divied. Especially in Internet access, and significant investments. But greater digital adoption will not be enough. Get the most out of the digital revolution countries also need to work on the analog compliments by strengthening regulations, that ensure competition among businesses, by adopting workers skills to the demands of the new economy and by ensuring that institutions deliver and are accountable. Digital development strategies need to be much broader than

ICT strategies. Connectivity for all remains an important goal and a tremendous challenge. But to bring the largest benefits countries also need to create the right environment for technology. We are closely following the emerging frontiers of industry 4.0 as we like to call it and implication of multi player SDGs. We are looking at how Governments and businesses can best engage to maximize potential impact and minimize potential negative ones. The digital revolution has brought many benefits. End at much higher rate than previous technological innovations. In Developing Countries yet Internet remains unavailable, inaccessible or inaffordible to most of the world's population. ICTs are playing an ever increasing role that are becomes per vea stif, biometrics, cloud computing. As well as cross sectors including environment, echo technology, medical technology, and energy to name just a few or maybe to name them all. Strategically, ICTs are transforming across services. Virtual circle of innovation itself resulting in greater efficiencies. Strategically -- okay. Policy implications, what are some of the policy implications for Developing Countries aiming to achieve the SDGs. We need a better understanding of how Developing Countries adopt new technologies and ideas and how to fa sill Tate labor mobility. By focusing on perspective of workers and consumers and lay suppliers, industry 4.0 is probably a good development. Everything else constant as we economists like to say. Consumers all the worned the world will be probably be better off and benefit SDGs by reducing transaction costs and increasing variety of goods and services being delivered. Industry 4.0 is probably a big challenge. Most of our relate to technological dris diss ruPtions that are associated to products, particularly the facts on labor markets. The good news is pessimism is likely overblown as new technologies also create new opportunities. However clearly some labors will see their jobs being taken over by robots. Important to invest in training workers to adopt to new technologies and new realities. I attended actually last night the G20 labor ministerial melt meeting at ILO and I can tell you this issue of adopt ability of workers was right there at the forefront. From a policy standpoint countries may need to look in to training programs to assist workers to adopt new reality as social safety net as a serious alternative. The poorest countries have massive investment needs for infrastructure. To close the diblg taldy individual -- and to close the digital divied. That can only be met when the public and private sector works together. The 2015addis abba action

agenda, catalyze the trillions of dollars of investment needed to achieve SDGs. The task at hadn't is to make development projects attractive to the private sector and to finance and appropriate to implement. The event is rethinking it's proech to development finance, especially to infrastructure of finance adopting what we call a cascading approach to financing development projects. Starting point for development decisions under this cascading approach is that every development project or program can be financed on commercial terms without Government guarantees while remaining affordable and offering money for value. The role of international financing institutions like the World Bank Group should be on facilitating such projects by the private sector but not putting the money up itself. Private sector finance is not cost effective or viable to the perceived risks or market failures including social or environmental externalities, focus support on addressing these through reforms to strengthen and sector policies regulation institutions would be a role for international financial and multilateral development banks. There are risks remain high and raise the cost of private finance beyond what could be afforded by project revenue generation, we need to explore the potential for lower the financing cost by deploying concession and public resources and risk sharing mitigation. The private sector is not cost effective and viable. Public and concession resources should be applied. So the cascading objective is really trying to look at what is really we can leave to the private sector and it is telling our staff and other multilateral banks that we should not engage in easy to finance projects. If doing a report in middle income countries can be financed in a sense by the private sector it should not use public resources to do so. It might be engaged in derisking these type of projects or in project preparation so that the private sector can be interested in putting the financing out but we should not be engaged in the financing itself and this a real shift for the bank and it will real a real shift in incense sensitives within the institution. We really are can pushed more and more to go to the more difficult part in the world to finance projects and to implement projects and leave the more easy ones to the private sector finance ing for all us to do. Help in partnership with the private sector to generate the trillions of dollars needed to invest in resilient infrastructure and to promote sustainable industrialization. Mobilize resources alone will not be enough to deliver on the SDGs, and in general and SDG in particular. Open and transparent partnerships among all

parties Governments, private sector, NGOs, multilateral development bank the UN agencies and so forth involved in assisting countries to implement the 2030 Agenda are needed to deliver on the SDGs and SDG 9 in particular. No one can deliver this agenda or even one SDG on its own. The partnerships are a requirement in a sense for delivering on the SDGs. And we need to combine our knowledge and look for areas of complimentarity for each organization can pri bri expertise and solutions combining constraints to development. On SDG 9 we have engaged in a very fruitful partnership with UNIDO. UNIDO and the World Bank have identified quality infrastructure development. Pilot countries like Ethiopia, Senegal and Peru are identified and work together to promote resilience in infrastructure where we rely on one another's comparative advantage to ensure positive outcomes. Practicalically in June 2016 UNIDO and the World Bank sew lid fived their partnership through signing of a MoU. You heard the Secretary-General Houlin Zhao also talk about the MoU that is signed between UNIDO and ITU. The world bank is also very busy in signing MoU with various UN agencies and practicallior oriented MoUs that we are sure that we take away a lot of bottlenecks. Conclude, new sources of innovation and partnerships and finance are opening new opportunities for Developing Countries. Con stront complex challenges, close collaboration between public and private sectors in order to maximize the positive impact that a digital transformation and afford industrialization can have on the attainment of SDGs in general and SDG 9 in particular. I would like to thank you again for the opportunity to speak to you. Thank you.

(Applause.)

>> Thank you very much Mr. Jos Verbeek for those excellent insights which included I think the breaking news that the World Bank is shifting its emphasis to hard to reach areas or hard to finance areas I guess is very good news for the 3 billion plus people that that still remain unconnected and remain offline. Which sets unperfectly for our first panel discussion of the day. This will tackle the critical issue of sustaining -- Mr. Tim Unwin who will lead proceedings. Tim is a long-time friend of WSIS and UNESCO Chair of ICT and emeritus Professor of Royal HOlloway university of London.

>> TIM UNWIN: Thank you. Very helpful introduction to this session. Thank you all for being here. I know there are many competing interests and I think some of us on the panel are wondering whether we are going to be 6 people or 600 here this morning. Our job is to make this a lively interaction

and discussion. We don't come together just to listen to things we could read. So my task as Moderator is to get these amazing guys to inspire you to have a conversation and if we have time and rest assured I will finish in time for the tea break, we will catch up a little bit. So I'm going to be tough on them. We hope we can involve you in that discussion as well. I would like to recognize Ms. Hidra who is MD policy and support for UNIDO. Thank you for being here. Thank you ITU for working collaboratively together. We can't deliver any of these SDGs by ourselves and just as reminder. How many of people here know what SDG 9's title is? I don't -- don't show your hands but my reading of it off the UN site and this is the focus for our in our discussions this morning is to build resill yebt infrastructure and build industrialization and foster innovation. Without more ado I would like the panelists to each introduce themselves. Those who know me I have yellow and red cards and yellow means to kindly come to an end and red card means that audience gets up and shouts and tells them to move on. Two minutes each. So the panel consists of far left, but Elsie Kanza who is head of Africa world ghik Forum.

(Applause.)

>> TIM UNWIN: Constance Bommelaer who is senior head of the Internet Society.

(Applause.)

>> TIM UNWIN:

>> CHRISTOPHER YOO: University of Pennsylvania CTU director. And Michael Pittelkow who is general manager of public services Africa, SAP Civil Society. So let's go to Constance, two minutes yourself, why this issue is important.

>> CONSTANCE BOMMELAER: Thank you for the opportunity to speak to you today. A quick word about the Internet Society, we were founded 25 years ago by one of the inventors of the Internet, Vince Cerf to lead an Internet policy and development and technology and we happen to be the home of the IETF the Internet Engineering Task Force which produces some of the standards of the internet. When the World Summit on the information society the ten-year review happened and also the Summit on Sustainable Development Goals adopted am bishoulds goals for the next decade, we were very excited to see that infrastructure development and specifically ICTs and Internet access were listed as priorities. Beyond the simple goal of infrastructure development Sustainable Development Goal No. 9 we also see that the use of ICTs and Internet access can be used as a catalyst across all of these goals, whether we are talking about health, education, elevating

poverty. So we took that very seriously at the Internet Society and we decided to have a specific focus area on access to contribute to reaching those Sustainable Development Goals.

>> TIM UNWIN: Brilliant and that was only one minute and 19 seconds. So we have caught up on time already. Michael, the Government of Internet Civil Society, we moved to private sector, a little about what SAP is doing and why this SDG 9 is so important.

>> MICHAEL PITTELKOW: Thank you for the opportunity to speak to this distinguished audience this morning. I have a second role and this might lead to the second one. I own the relationships to the development partners SAP to development partners and this tells you that we as a company take the SDGs and sustainable inclusive development very serious, also as a business opportunity. We consider this to be key. And this -- so we engage with the German Government, the European Commission, USAIDU name it, not only on the implementation asking for finance but we start already in the dialogue phase to ideation and then to implementation. We are the front runner in terms of public sector, private sector, corporation and development. We found out that corporate social responsibility is important, no doubt. But not enough to support our business model. And then we found out that there is an intersection between the private sector goal to maximize revenue. And the public sector goal to maximize welfare and there is intersection where these two things come together. As a corporate socially responsible corporate we engage in this area and we consider ourselves to be an enabler of the SDGs and we list them ourselves as well because everyone has to contribute.

>> TIM UNWIN: So much in that and we can start discussing and debating. Christopher Yoo the ITU is eager to involve academia. No idea why. Maybe we will discover. We move to academia.

>> CHRISTOPHER YOO: I think there is a very good reason why. We can bring anl lit kal methods to bear, few a different levels and what other Governments can often pull together and we also can sign, for example, we have certain independence we can sign nondisclosure agreements to get commercially sensitive data, what we don't need to disclosure publicly the commercially sensitive parts and academics play a role, and the nasty is he secret of can a dem mic. We are leading an initiative one role connected which is built on commitment and idea that we need more solid data in the world. In talking with Ministers they find themselves sdsh they made the transition from having to be convinced that connectivity

is a good thing to being baffled by the number of options presented. Advocates and companies fall in love with one technology and begin to try to advocate to say this is the solution you should adopt it everywhere. And what we discover is the Ministers are having trouble sorting out what is right for their country, and what they dispritly a hard concrete evidence from real world experiences. We gathered over 500 case studies. We will have a hundred of them done by the next IGF and about 40, 50 of them in the can right now. And make quantitative evaluations of what works and what doesn't. We are doing control trials to show impact on education and other aspects to mobilize not communication ministries but other parts of Government to get the kind of broad based support that these projects need to implement themselves at the scale they need to.

>> TIM UNWIN: Brilliant. I never know when the World Economic Forum is private sector or Civil Society or it brings Governments together. We began with Civil Society and we come back.

>> ELSIE KANZA: The World Economic Forum is an institution for public private cooperation and it is an umbrella that brings together all the multi-stakeholders to cooperate and collaborate together to solve a number of complex challenges that individual stakeholder groups cannot solve on their own. And in particular the in the context of the theme of this particular session, complex sessions is digital society. I wear two hats. One is managing and curating the foreign strategy for Africa, Sub-Saharan African and the second is directly manager relationship with Governments. In the context of connecting the unconnected we have an initiative called Internet for all which seeks to connect the billions tho are unconnected but in this case focused on Sub-Saharan Africa and one hand it is one of the lessons that we can learn globally that we can put in to practice but also helping the Governments navigate the many options that are out there and helping to collect data about what important this could have both positive and negative.

>> TIM UNWIN: Brilliant. Thank you very much. We have heard from them the broad background and the format we are going to adopt I am going to have three questions that I will ask and each of them will respond and we will have a little discussion. If they are good there will be an opportunity for you to interact and come back with some questions and then we will try and pull it together with two final questions at the end. So beginning with -- let's begin this side. Michael what do you think the most important conditions are required

to ensure that the ICT sector, the industrial sector can actually contribute to sustainable development particularly sort of through the notion of SDG 9? Two or three things.

>> MICHAEL PITTELKOW: There are more than two or three.

>> TIM UNWIN: I thought. You can maybe get through more very quickly.

>> MICHAEL PITTELKOW: We heard from before that it is not only about technology. I think that's -- that might be a surprise from a technology provider. But top of the list is that we understand that the analog aspects of it are equally important. And we not only as players but Governments decision makers but also companies in Developing Countries that want to embark on the I40M journey. So that's the first thing. This means a wholistic approach capacity is important. SAP I mentioned before we do an Africa code week. We do a skill -- various programs but we cannot borrow the ocean and we teamed up with public sectors and entities and that. And capacity and then that's No. 3 and you have to understand what you want to achieve. It was very interesting to hear, there is a lot of technology out there and everyone comes with technology and says here is a piece of technology. Let's see what we can do with it. So ask absolutely wrong approach. First you have to understand what do you want to achieve. What is it that you want to do and then probably you can select the right technology and there is also I think speaks to Elsie. Let's advise. It is not about technology but it is about purpose.

>> TIM UNWIN: Elsie come to you on the same question. What are the two or three things that need to be in place to enable the technology to deliver?

>> ELSIE KANZA: Ground zero I will echo what was said earlier this morning which is the context, the operating environment in particular the context of again Sub-Saharan Africa where we are lagging behind in terms of competitiveness and this is important on many fronts. Technology has to be applied in a particular environment if we are talking about scaling for work, you know how easy is it to create the jobs. So that needs to be addressed in general. But one particular aspect that I would like to focus on that I think deserves a little bit more attention is the users themselves. We are in the process of rolling out Internet for all in South Africa and there are some hard questions being asked, 1, why is this relevant to me. They don't even have water, for example. Second is --

>> TIM UNWIN: Can I interrupt? That is often said. I do have an answer for why they should care?

>> ELSIE KANZA: There is an investment that needs to be made to make the case for why they should care about connectivity. And not just providing the supply. But actually figuring out walking in their you shoes so to speak. What are the needs in that space and what technological solutionses or innovative solutions make sense in that context. The challenge from a supply side if you allow me to use that term you talk about millions of people. So are we going to individually interview millions of people to help them understand what they should desire but don't appreciate yet.

>> TIM UNWIN: Okay. It is a tough -- because supposed to go first, take the answers that other people will give. I have a difficult question who to go next. Constance we will let Christopher have the last one.

>> CONSTANCE BOMMELAER: It is a very good question. We are able to say today we know that, for instance, the use of ICTs can be extremely important in monitoring water supplies and thinking about how we distribute the supplies and this has become obviously in many fields beyond environmental issues. And coming back also to what Michael was saying, what is it we want to achieve here. I think there is also, you know, conceptual work thinking about how we can use ICTs with a wholistic approach. Thinking about all these new Sustainable Development Goals we have adopted. There is work to understand and make the intellectual connection between elevating poverty and using ICTs between health, and we have good health conditions everywhere and using ICTs. And we are learning on all of these fronts. Here I would point to the excellent matrix that the ITU has developed with many, many partners which allows to enlighten the map and give some indication on how we can go forward. How we can build partnerships beyond the ITU, beyond the community that is here and reach out to the banking industry to reach out to pharmaceutical industry. And at the Internet Society it gives me an opportunity to mention that we have developed and launched a report on how to use ICTs for educational purposes and it is beyond digital literacy. It is also about having cheaper access to information and educational resources. Resources that will be available everywhere. Resources that will be updated much more easily. So I think this wholistic approach really is absolutely critical to set the strategy and also think about what kind of new partnerships we need to develop.

>> TIM UNWIN: Brilliant. So what are these guys left out Christopher? What are the most important conditions that

will enable the ICT sector to contribute?

>> CHRISTOPHER YOO: The first part I would make is Governments need to create an environment of policy flexibility. What we are covering is -- tremendous innovation and business models and people are finding brilliant solutions to existing problems. If we create a regulatory regime which thinks it knows what the right answer is, it becomes much, much too narrow. It is not one solution. We are going to do different technical solutions in different areas and what are the dimensions of when a particular solution is the right answer and to try to get traction on that and that is our goal. The second side I would say is something that both Constance and Elsi touched op which is the demand side is critical. We have a tendency in the telecom to focus on availability and price. Every survey from the developing world and the developed world identify relevance and digital literacy as much more significant barriers and that fact Minister of from Rwanda this morning said access to devices. Developing country is 2G shifting to 3G and other parts of world we are focused on legacy devices that are very different. So I would say in those two things if we can really created a flexible world and address the demand side as well we will have a complete solution as opposed to just a supply side solution when you are trying to figure out we have built it, why aren't they coming.

>> TIM UNWIN: Thank you very much. Let's reverse the order a little bit. Michael I'm afraid you are going to be last on this one. Let's move now to the actual technical industrial side. We hear a lot about connecting the unconnected. And in doing that the ICT sector industry has a crucial crucial role to play. So Constance can we begin with you, what we most need to have to ensure the infrastructure particularly broadband is build to connect the unconnected.

>> CONSTANCE BOMMELAER: That's a very good question and the WSIS Forum this week is a good opportunity to take stock on where we are in connectivity. Mr. Houlin Zhao mentioned we still have half of the population that remains unconnected and this emphasizes the importance for us to find ways to work together to reach these accessibility and connectivity goals. And it is also a good opportunity to assess the future work that we still have to do. In this regard we know that it is better to have a blended approach in terms of policies and capacity building and the experience in the field shows that it is very important to not just have incentives for the industry to develop infrastructure but also think about the policy environment and this is what we call at the Internet

Society creating an enabling environment for access development. So again a wholistic approach in thinking about how we lead the development of connectivity and development of access again I think is very important.

>> TIM UNWIN: And Christopher the same question to you. What needs in place to enable industry to roll out broadband to everyone?

>> CHRISTOPHER YOO: Appropriately for a venue at ITU we need actually an idea of how big the problem is and more specifically where the problem is. A mapping study of different kinds, connectivity coverage studies would be essential. We turn to the ITU data now. They are all about subscription data not availability which is a problem. They are of uneven quality and because of the way they are collected relying on nation states. And it is an area where if the -- an organization like the ITU could do a convening power to find out where if nothing elsewhere cell towers are located, that information is available. It is generally held by proprietary information gathering, organizations that sell it. It is public information. It is something that can be gathered. And those are roles I think that could really tell us in a world of limited resources where do we need to put the dollars in a way that the World Bank speaker said earlier to really try to make sure they have the most important.

>> TIM UNWIN: Let me push you a little bit. If we knew where all the cell towers were we would find some dark areas. Should we be filling those areas? Is reaching 100% geographical coverage something we want to do or should we be yet getting a cost benefit analysis in terms of numbers of people and spatial area?

>> CHRISTOPHER YOO: I would answer your question two ways. If I had the access for cell tower information we would overlay it with population density and tare rin and find out what things could be fulfilled with commercial technologies and which ones were on the border and which are going to have heroic intervention. Should we get 100% coverage? . No. The most expensive line in the U.S. is $50,000 for a single line every year. Every broadband plan that I know recognizes the last 2% will be served probably by satellite. Not because the quality is as good. We know that it is not. It is because from a cost benefit analysis there is not enough population density it is not feasible to supply them in a different way.

>> TIM UNWIN: Okay. Elsie the came question to you.

>> ELSIE KANZA: I will start off from point about satellites. I concur as well that for some broadband is not the solution but when you look at what is happening in the

satellite space and game-changers nanosatellite s that are Democratizing. Not a concerted effort to think about that solution for the last mile. With respect to the business case for broadband where that is applicable our theory of change through the Internet for all is that you need to consider four things in tandem, infrastructure, affordability, local content and skills development. You can build infrastructure but if nobody uses it it is a waste of time simply because it is not relevant to them. If you are developing skills but you are not sure there will be access that doesn't work either. So that -- the only to be dealt with in tandem using a dashboard so to speak and then the other complimentary part is for hard infrastructure which is a broadband itself, where the business case is mixed, it doesn't make sense as a pure private sector play. We need to think about what the alternative solutions might be to make it work. And with the Forum we have an initiative called the sustainable development investment partnership which brings together different Actors to create blended finance solutions and this to some extent builds on what we heard earlier about the World Bank's approach that can enable the funding to take place at that level. But last but not least, right, without energy, there is no technologies. So we need to think about that too and in the energy play the regulatory framework at least in Sub-Saharan Africa is a major obstacle.

>> TIM UNWIN: Brilliant and it is quite good that we kwo come to the private sector last. If private sector has a key role to play in rolling out broadband and connectivity more widely. What do you need that yeah, we are going to go and do that.

>> MICHAEL PITTELKOW: I'm not in a position to add something value inl on top. But look at this from a private sector perspective I under -- we understand that accessibility is a human right and these things but what we do is we look for business opportunities. Investments follow business. Business opportunities from our perspective. And that leads to what else is said before, explain South Africa why should care in a rural area about the Internet. What is it in it for me. I will give an example to make it concrete. In Ghana we have created a digital solutions for in the rural area for Cashew nut collectors and we have connected them to the global market. They produce really very, very rural areas and that's a business case for them. And they grow in business. It is a business case for us because we position solutions. Grow it, and then accessibility will follow and infrastructure will follow I'm pretty sure. There will be some areas left behind.

That's what public sector needs to get in. I said business opportunities. And it needs access and it needs illiteracy and it requires a new definition of what infrastructure means. And when I listen to and read what infrastructure we are talking about broadband and actually we are talking about cables and satellites and things like that. I'm a firm believer there is also something like a virtual infrastructure. Cloud infrastructure or platform approaches, don't reinvent, don't -- you all know this map. Uganda mHealth projects with 80 pilot projects in one country on the same subject, this is not only a waste of money but it doesn't give a business case of private sector. So I would advise to think when you talk about infrastructure to think about virtual infrastructure, platform cloud, things like that.

>> TIM UNWIN: And governments can play a key role in terms of regulatory environment.

>> MICHAEL PITTELKOW: I agree.

>> ELSIE KANZA: The challenge is that the financing instruments that we have and our risk assessment make it difficult for traditional financial institutions to invest in cloud computing, right? Virtual infrastructure. So there is a gap there where we need to play catch up to be able to raise the investments that we need.

>> MICHAEL PITTELKOW: That's where trillions of private sector comes in. If we find a business case of a health platform in a country we would do that.

>> TIM UNWIN: Okay. Third question and come up with your comments and questions and we will have short interventions from the floor. The ITU is the body that helps get general global standards and I'm sure UNIDO does similar things in terms of standards. So what are the suggestions that you might have for UN agencies in terms of setting standards global standards that will enable the benefits of ICTs to be rolled out to everyone? And yeah, let's begin with Christopher.

>> CHRISTOPHER YOO: So the ITU is in a key position to gather information and oddly without information you can't get decisions. So already I mentioned improving the data gathering. There is some vul ner able populations beyond what we talked about that have not been addressed. There stakeholder gender gap. There is a disability access gap. Refugee populations, senior citizens, and not just about digital literacy, outright literacy what do we do with illiterate populations because large numbers are there. I think the ITU could begin a huge convening function to collect data and localize them. There are agencies that require, for

example, all projects funded by them or associated with them to report data separately based on gender.

>> TIM UNWIN: And 10% of the world's population has some kind of disability. Thank you for raising some of the most poorest and most marginalized.

>> MICHAEL PITTELKOW: Whom am I to advise ITU? What I see in day-to-day operations is indeed very basic stuff like data exchange standards, knowledge what is out there. What is required. Very simple things. This leads to education. Also government. It is about the awareness, what is possible. So in preparing this session I read a pretty interesting come from UNIDO on industry 4.0 and there are examples for industry 4.0 in emerging countries but what it means to think out of a box to enter 4.0 that is not well-known. This is something where I think information sharing, information gathering and sharing could be a key role. And I'm not talking about best practices because I don't believe in best practices. Every solution has to serve, has to address the specific problems but examples I think it is about examples, what can be done and what others have done so that you can learn.

>> TIM UNWIN: I get to pick up on that. How many people in this room use the term best practice? We should never ever use the term best practice. There are lots of good practices out there that people can choose from and localize to their own context. So a plea from the Moderator, one take away for me never use the term best practice again. Thank you for introducing that. Constance.

>> CONSTANCE BOMMELAER: Many things have already been said but think the participation this week shows that the ITU can play a leading role in raising awareness on the importance of Internet access for broader development goals. I would also echo what Christopher has said. I think the organization is in a very good position to gather data and the best way to convince policymakers and the industry to make the right investments is really by demonstrating that it is rational and it makes sense and it is in everyone's interests. We know, for instance, looking at data from the SIVs that the impact of ICTs on growth now in 75% of the cases is not simply in the field of ICTs. So this means the Internet is actually playing a role of engine for growth beyond the traditional ICT field for all sorts of industries in those countries and I think it is by demonstrating and putting forward some facts some data that policymakers and the industry can have a hard look at we will be able to steer the efforts in the right direction.

>> TIM UNWIN: Elsie om concluding thoughts on standards and maybe not just ITU but UNIDO as well.

>> ELSIE KANZA: I was going to say ITU and the other relevant UN bodies in particular. One is in the context of industry 4.0 is helping with the creating standardized certification. Even without subindustry 4.0 getting registered by regulatory bodies in one country when you have a regional framework and then having to do it in every other country, just in the single continent, let alone the rest of the world creates unnecessary friction. So facilitating that exercise of being able to set common standards for certifying new products and services would be helpful to strengthening bureaus of standards. The second is aligning also on a much harder front but nontariff barriers. So we are seeing new barriers pop up with respect to e-commerce. So you could be a producer in Africa who will find it very difficult even now to meet the standards of exporting in to Europe. What's the point of having the connectivity if you cannot trade easily and on the back of that you have the payment system needing to speak to each other. Right now people circumvent the standards we have. It is easy to lodge your goods and carry your own personal baggage and it is mainly the regulatory backbone where they are not quite speaking to each other and we need to take in to account SMEs. Not the perspective of big businesses but small businesses, individuals who we thought would be empowered with connectivity and being -- becoming digital citizens and last but not least, particularly in the digital literacy space what is a minimum standard for being digitally literate and I think the convening role and organization role that ITU can play can help us agree on what is minimum digital lit raysy is. Regardless of who certifying the solution we all understand what it means and facilitate countries with educational policies. S.

>> TIM UNWIN: You mention one of the SMEs which is one of the top priorities here.

>> CHRISTOPHER YOO: I would be remiss, my friend who is involved in the equals project ITU has been a leader. There are still remains much to be done. The other dimension might be taxation. We have a nice example from Ghana and other countries I countries look at them to empower population. One area where the ITU could be helpful is gathering information on how Universal Service Funds are being present. There is actually remarkably few resources to try to catalog that. So if we understand where the need is and what's working that would be instrumental in helping us understand that better.

>> TIM UNWIN: One message that I am getting from y'all the way that UN agencies are beginning and making some

approach in working together. Equals although championed by Doreen here in the ITU is also linked with UNWOMEN and UN University. And Elsie on e-commerce and trade, UNCTAD. I think the panel has done a great job in encouraging us to think creatively around this. We have got five minutes. Keep them very brief and succinct. You can introduce yourself and name and organization. And if you dare to be come up more than one question, you will be taken out and something will happen. Yes, please madam.

>> My name is Catherine Hagen with the global social observatory. I have spent quite a bit of time at the Human Rights Council on digital aspects. Human Rights aspects of the challenges that you are facing.

>> TIM UNWIN: Somebody think about the Human Rights answer, maybe Constance or we will come back to. We will take two or three questions and one of you respond on each. Human Rights question. Next question, comment. Yes, sorry. Didn't see you there.

>> I'm Vanessa gray. I am in large of LDCs and emergency telecommunication. I had a question. There was very important I think you mentioned the importance of data and, for example, the information on cell towers. We know that that is difficult to get from some countries. We were actually looking at that. ITU was looking at that. Not every country is prepared to provide this kind of information. And so just one thing that we are increasingly looking at now is using Big Data to get better information. Information on cell towers if you look at people's phone records call detail records this is information you could get. You could actually get not just information whether there is a cell tower or not but the quality of the connection and if and how often people are using this information. And obviously is there is a huge debate about privacy and security issues and was just interesting this week there was also a session on accessibility and people with disabilities and the need to create profiles for them in the case of emergencies so that if there is an emergencies we can have a special alerting messages for people with disabilities which is wonderful. But it seems there is sort of seems to be a different standard that in some cases we can use Big Data and we can even have personalized information that we are using when it is really necessary and other cases there is really a great reluctance to use Big Data and this information. My question is what can this community do to really push for the use of new technologies of new applications and services that can really help us then to get that data, better data make better

policies and to push for this to say how can we, you know, find a balance between the privacy issue and the usage.

>> TIM UNWIN: That might be for you Michael and one more comment, question, observation? Yes, in the back.

>> Thank you very much. And thank you to all panelists for a brilliant conversation so far. My name is Christan. I would like to get more views on the taxation point that you just raise. I support that idea but I would like to hear more what we can tell Governments if you are losing these taxation revenues here are more measurable ways that you can get more money out of that in the ind.

>> TIM UNWIN: Thank you very much. So let's go to those -- there is HR data and taxation, Human Rights.

>> I think it is critical and very important. Especially because we know Human Rights are embedded in the work of the entire United Nations system. And all the partners that work with the UN. And we are starting to understand the extent to which ICTs can be used to enable the enjoyment of Human Rights whether it is to share ideas to communicate freely, to -- to support press freedom. All sorts of Human Rights fundamental rights that can be empowered, enabled by the use of ICTs. So I would say that this really helps us build the case on the importance of access overall, the fact that Human Rights should be, of course, the basis of our work and because Human Rights are enabled by access to the Internet again this is helpful to build the case on the importance of connectivity.

>> TIM UNWIN: Thank you. And data, Christopher you want to lead on that, Michael do you want to say something on that as well?

>> CHRISTOPHER YOO: In response to the question on taxation since I brought it up.

>> TIM UNWIN: Big Data and the disability linkage and different qualities of data and --

>> CHRISTOPHER YOO: It is kind of fascinating. A lot of very interesting research is not being done on Big Data but try to use satellite mapping and details from that. It is sometimes little data. The probably lem is big ka that aspects I wouldn't be surprised if those algorithms are happening now but they are being held proprietarily won companies and what happened unfortunately some of the best research moved from publicly accessible to private. Whenever I here Governments they ask me how did we get data I say you are the people in the best position to get it. What strikes me an organization like the ITU and the Member States that comprise the ITU, spectrum access seems to be publicly license and authorized for particular power levels this is deeply

publicly link information that is Government were to determined to do so they might be able to make it publicly available but as you note they are not always willing to do so.

>> TIM UNWIN: Would you like to add something?

>> MICHAEL PITTELKOW: What is important on Big Data from a technology perspective. I'm afraid I have to share you with you, almost every analysis is possible if the data is there. It require s a good regulatory framework around it. That's one aspect I want to add.

>> TIM UNWIN: And I would like to pick up on small data. You may know that United Nations university computing and society initiative has a special initiative on small data and mentioned GSMAs sort of coleags of private sector data which is rich and useful. Elsie.

>> ELSIE KANZA: Thank you. Two comments. One coming back to what Constance said, I agree and I also agree that access to the Internet can be used to violate Human Rights. And I think this is an area where ITU can play a role particularly when Governments choose to switch off access to the Internet at will. The gray areas of Internet, so safety is an issue that needs to be addressed as well. And abuse of other forms. So I think that the dark side of technology is something that we shouldn't shy away from, similar to the analog world. We need controls and balances and social agreements to be able to use it in a positive way. To society. With respect to taxation, just cite example of a Minister from East Africa who heard of an example from India, the Minister was able to show evidence that by foregoing taxes on devices over a couple of months are able to recover the taxes from usage. So I think the more we have evidence that can be put forward to Ministers of finance the easier it becomes for them to buy the idea that it is not worth taxing devices as a form of building up their tax base.

>> TIM UNWIN: Thank you very much for reminding us of the darker side. We tend to always upload and praise the good side but we also need to limit the dark side. But let's follow the taxation Christopher and then Michael.

>> CHRISTOPHER YOO: This is an important theme the World Bank had mentioned this is a major priority of the World Bank. I wear another hat by I am on the steering Committee for Internet for all initiative and I Chair the data Working Group. And our goal is to create success story and the taxation story is one of them. We are having a session at 4:15 today. We are soliciting specific case study partners to help us find the ones and we are boiling them down and we are

going to create the kinds of tangible evidence that Elsie is talking about that you can show to a Minister here is how it happened in Ghana. Here is the total impact on economic connectivity and we can make the data case for it and we are trying to do this in taxation spectrum policy to encourage policymakers to think more flexibly and liberally about what's going on.

>> TIM UNWIN: This session is at 4:15 on floor 2 of Monday brilliant.

>> CHRISTOPHER YOO: Yes.

>> TIM UNWIN: Final thoughts on taxation?

>> MICHAEL PITTELKOW: My world is gray and that means I am a big fan of finding mutual interest. One of the key problems I see in countries in Africa that's where I work is domestic revenue mobilization, resources are there but Governments are not but financed properly. Why is this? To make it simple, very much because of the dom nans of the cash economy. So you don't get access. You don't know. Syntax solutions, but also tieing the registration of a mobile phone or of a SIM card to a tax number to make sure that people are on the system who will help to mobilize this domestic revenue. This does not mean everyone has to pay taxes but it means that everyone is on the system and Government is aware. And for me this leads to equation -- equal taxation which is also something very important. It is rule of law. And it might also lead by broudenning the basis to less tax for everyone. So there is also benefit in that.

>> TIM UNWIN: Thank you. We are drawing to close. So let's think forward. Let's be creative. Let' be daring and although we can't be quite chattum rules but looking forward what do you think is the most needed ICT innovation remembering SDG 9 about resill yent infrastructure, promoting inclusive and sustainable industrialization and fostering innovation. What's the most needed ICT innovation. No one will blame you if you are wrong. Let's have some fun in this final session.

>> ELSIE KANZA: Speaking to my sister from UNIDO in particular I found myself in a remote part of northern Kenya a couple of months ago where all you could see around you was land and animals. We were getting some insights from a local Civil Society group that had managed to convince the Sambura households to use family planning methods but there is no shops. There is no -- there is no supermarkets. There is no supply. And it struck me then that we need to invest in makers and how can we leverage technologies like 3D printing to dem cratize small manufacture soing that sudden solutions

that are basic to households on a daily basis can be innovated and manufactured locally and do not need to wait for supplies to come from some urban center. If we can create a grassroots movement and it is happening. India has a very good national Institute is that rewards these grassroots kind of innovation and grassroots. And to address the needs of our rural and remote based populations.

>> TIM UNWIN: Can I be naughty? Do they have Coca Cola in the villages?

>> ELSIE KANZA: In many villages you do have Coca Cola.

>> TIM UNWIN: Cola live is one way that we can make this happen. Many we are talking about mini drones that can deliver family planning.

>> CONSTANCE BOMMELAER: It is a very difficult question.

>> TIM UNWIN: It is your chance to change the world.

>> CONSTANCE BOMMELAER: I am looking forward to seeing the impact of innovation when you think about applications Artificial Intelligence applications in the health environments. Deep learning is making tremendous progress and in terms of, you know, Big Data analytics we know that the innovations ahead us can be really incredible. So I think that would be my choice.

>> TIM UNWIN: Christopher.

>> CHRISTOPHER YOO: I'm going to fight the question. I think that the big promise isn't the big innovations it is deploying the old ones. Ethernet wireless in Zimbabwe are providing Ethernet toe off grid using diesel generators attached to cell sites and they are providing not only connectivity but they have surplus power that they are selling, power 4LCD whites. Courtesy of the World Bank and gaets Foundation they are using the pou towers to power refrigerators and distribute vaccines to this part of the world for the first time. These are very old technologies. Cellular see diesel generation and vaccines but in many ways leveraging the -- making the most of plain old vanilla old technologies I think will create for more radical benefits.

>> MICHAEL PITTELKOW: Who has thought of block chain or about Internet of Things. Focus on day-to-day operations, making things happen rather than looking ten years ahead. My biggest wish would be the better adoption of what is out there. Just use it in this -- and doesn't necessarily have to be cutting edge. Diesel is not what I would prefer first hand.

>> CHRISTOPHER YOO: They are working on solar.

>> MICHAEL PITTELKOW: That's one thing and bring together various streams. There is ICT and there is health

care but actually what it is it is ICT in health care. There is -- there is agriculture and there is digital. Digital in agriculture. So bring together various things. And link it to, for example, solar power, it is a small households I have seen that in Tanzania and they now charge drones with the electricity that is produced in these households and they use it for delivery. It will lead to African Friday 4.0, that would be my vision.

>> TIM UNWIN: Ladies and Gentlemen I can listen to these guys all day but we have come to the refreshments break. For those who are fasting in Ramadan. Sorry it is coffee and tea but you can relax and take a break from the intellectual discussion. Will you please join me in thanking this amazing panel and from my side I didn't have to use a red card but we have had such a rich dialogue for this morning. Please thank them in the usual way. I think my take-aways are very much this is meant to be an industry innovation sector and we scarcely spoek about the technology and we spoke about lots of other things that need to be in place to ensure this amazing kit and ideas do have the impact on delivering SDGs. I heard the need for a wholistic I approach and not only academia, private sector Civil Society and Governments to work together. But for UN agencies to work more collaboratively. And it is brilliant to have UNIDO and ITU working collaboratively in taking forward this initiative and I heard third that we need these guys showed this, in plenty, passion and drive and commitment to ensure that we do use this technology to deliver on the SDGs. So thank you for being here. Thank you for those three important additional questions. We couldn't cover everything. But I do hope you enjoy the rest of the day and other sessions tomorrow. Thank you.

(Applause.)

>> Thank you very much for the excellent panel. I think digital transformation is really been brought to life in that discussion. And thank you Tim for the best practice in moderation. And just to say we have a short break, 15 minutes to allow you to talk together and for us to mobilize for the next panel discussion which, of course, leads nicely in to the topic of preparing for industry 4.0. So please get back in to the room by 11 a.m. sharp. We will be starting at 11 a.m. sharp and I hope to see you all back here in 15 minutes. Please join in a round of applause for that essential panel discussion. Thank you.

(Applause.)

(Coffee break).

>> Welcome back Ladies and Gentlemen for the second part

of the special SDG 9 session. Thank you all for coming back. I hope you had a good break and a chance to discuss and chat with each other. Just wanted to thank before we start again the slenlt panel on digital transformation. I thought it was a grailt session and it sets the theme for the next segment which is preparing for the fourth industrial revolution, industry 4.0. I would like to join me in welcoming our panel of representatives to be Moderator by Mr. Frank Van Rompaey.

(Applause.)

>> FRANK VAN ROMPAEY: Thank you very much Paul. I would like to -- best practice. I am not sure that this is true (audio cutting out)

But it is really a privilege for me in any case. It will be (audio cutting out).

We have -- immediately next to me -- who is professor Mr. Sebastian Diaz. Industry 4.0 who is you all know. (Audio cutting out). Know industry 4.0 session on -- globally -- we will opening remarks by UNIDO and Ms. Ratika Jain can we ask you to come to the pulpit?

>> RATIKA JAIN: Good morning. It is a great pleasure for me to be opening the session at the occasion of the WSIS. During this session we will discuss how Developing Countries can best prepare for the inevitable advancement of industry 4.0. There is no doubt that industry 4.0 will have a profound impact on all of us. Be it on the factory floor, at the level of the household, or the public sector. It will impact advanced economies, as well as Developing Countries and economies in transition. Industry 4.0 being a possible game-changer makes today's discussion even more important.

So what are some of the implications of adopting industry 4.0? We know on the positive side it will base productivity and compestiveness on resources and promote the economy which are crucial for enhanced welfare. However there are several other issues including the impact on income distribution jobs and environments which are less well understood. Thus far analysis and discussion are focused on the implications of industry 4.0 for advanced economies. This is to be expected because they are leading the development adoption of these technologies. Today we'll be focusing on Developing Countries and economies in transition. Sure this is a large and highway ter row genous group of countries. As such some of them have already started implementing aspects of industry 4.0, others are preparing themselves to embark on the journey of implementation, while others still need to prepare themselves for the consequences of older countries implementation. Without wishing to preempt the ensuing discussions, UNIDO and

ITU will need to review it's proech and supply of technical assistance. In order to simultaneously wosh with all countries at vary levels of preparedness. Many Developing Countries have missed earlier technology waves due to the high cost of technology lack of absorbity and capacity and weak infrastructure and skills and information gaps. This has resulted in large GDP and productivity gaps. And hence why the differentials. Vis-a-vi OECD countries. Failing to take advantage of industry 4.0 which accentuates such gaps further. Ladies and Gentlemen, to enable Developing Countries and economies in transition to respond to the challenges and maximize the benefits of industry 4.0, and minimize its less digital outcomes the international communities through collective actions has to tn dlifing and strengthening its portfolio of services. More concretely the multi-dimensional and multi facetted challenges involved in transferring the benefits of industry 4.0 to Developing Countries and economies in transition require now approaches in delivering our services on the ground. To this end I am particularly delighted that UNIDO and ITU are successfully partnering on preparing Developing Countries for its implementation. I believe today's join event at WSIS is a small but important step for both organizations to platforms like these this we can advance the discussion and open up dialogue on how countries can prepare themselves. The opportunities it brings but also challenges involved. And importantly the crucial role that international organizations such as UNIDO and ITU play in hars rnenning the power of industry 4.0. So without further ado I would like to thank you and thank our distinguished panel for the contribution to this discussion and I will I'm sure that you will all enjoy the debate. Now I will hand offer the floor to my colleague Frank to continue the discussion (harkening) thank you.

(Applause.)

>> FRANK VAN ROMPAEY: Thank you very much Ms. Sami Haddadin, director managing director at UNIDO for policy and program support. And as Ms. Sami Haddadin right ly underscored this is first step to convene debates and discussing latest technological trends and implications on particularly Developing Countries. We will have a few key themes as highlighted on the flyer that was distributed for this session. First main theme is the policy challenges related to the adoption of industry 4.0 and I will start with that in a moment. And next important theme is the impact of industry 4.0 on employment generation and attendant skills requirements. And another important theme is the importance

of the knowledge base and the related support infrastructure, particularly for France innovation and productivity and the last theme toll relate it back to what Sami Haddadin just referred to what is the role of development agencies, ITU World Bank, UNIDO and many others in basically supporting Developing Countries to adopt industry 4.0 in an effective manner. So let me start with the panel discussion by discussing the preparedness for industry 4.0 from a policy and strategy perspective. And I would like to direct my first question to professor Sami Haddadin, so Sami. Sami given your wide experience in Germany in particular but also more broadly your wide experience in academia, in Government, in the private sector, how you see that Governments should be preparing for adoption of industry 4.0, how should they be preparing the private sector to be ready and to implement in an effective manner industry 4.0 because this is an inevitable transition. You coming from a leading country, Germany in industry 4.0. What is your perspective on matters?

>> SAMI HADDADIN: I think it is one of the first kind of roles that Governments should really take, take care of this and to be proactive. To take the role of leadership, to inform decision makers through the understand that this is a transformative change that will disrupt the entire industries that there change the business models and give new opportunities for small and medium enterprises and transform industry from the classical especially in Germany and other developed countries, towards flexibility highly integrated highly connected industry. And manufacturing kind of technology. And I think it is really important that these decision makers are also to be informed in industry. So not only the policymakers and innovators but say the decision makers in industry who are in their classical role of being leaders of entire industries, we heard about disrupt ions and AI learning and what is generating misunderstandings on what is possible and not possible. These technologies and potentials are made aware for all the decision makers across the board and I also was extremely important was to bring together all the stakeholders. Not only the innoit veators, technology leaders but also the small medium enterprises, the guy who manufacture lots of the things that provide the backbone to the large industrial players, especially the large OEMs, for example, the automotive companies. We need to inform the SMEs. We try to bring them together to krooe Kate a kind of ecosystem in making them understand what are the potentials, technologies that are available, what is the roadmap of potentials that you can put together to create new

business model to create also new transformations within your own companies, especially what is it that changes from yesterday to tomorrow in our own company. How can you also give template solutions. They want to call it good examples and how classical and very old P cans which we have a lot of in Germany, (companies) how can they can transform themselves in to industry 4.0 companies and this is a very important aspect to bring together. And we also heard lots of questions about standardization, to really make the markets ready to make technology compat ibl and another important aspects that Governments have to take a leadership role to push this forward. We see this in autonomous cars happening at the moment and especially in important in industry 4.0 because we talk about connected automation and there obviously a role of standardization and prime and crucial and determines if you are successful and universal and could be overcome if you don't deal with this early in the beginning and make this very kind of the core of your quality of automation.

>> FRANK VAN ROMPAEY: That very much. This leads me directly to turn to Ratika. You set out a number of important aspects, aspects that seem to require a longer term strategy to bring together, you know, the approach in a coherent manner. You as an industry decision maker important country like India, what is your take on the need for coherent strategy with longitudinal dimension? How do you see matters?

>> RATIKA JAIN: Frank I think to the extent possible there is need for coherence. If you look at a country like India, you will see that different sectors are adopting technology solutions to different degrees. I mean in India specifically you have sectors like the auto motive sector, defense, aerospace, electronics and elements of engineering who really are a the cutting edge and needs to be at the cutting edge just to be globally competitive. And it is absolutely critical that they are, you know, at par with the global peers if they wanted to compete in the space. Now therefore what does a country -- I mean how can a country kind of support this. I mean one option is to let, you know, institutions figure out this journey on their own. And, you know, I think we don't have the luxury of time to say that we will be able to let individual stakeholders figure this out and be it industry, be it the institutional support ecosystem. I think it is important that one tries to bring some sort of shared understanding as to what -- where we are going with these kinds of technologies and what are the possibilities and create an enabling institutional ecosystem that supports it. They will have technological dimensions that will have other

dimensions with respect to skilling which is a huge aspect which these industry 4.0 revolution is bringing in. How do we create ready, you know, workforce that is adaptive to these kind of technologies. And in the last session we also heard the need for governance models, you know, how are we looking at intraoperability issues, standards overall governance and these are dimension that a coherent strategy would help.

>> FRANK VAN ROMPAEY: Thank you very much. Creating a shared understanding in a country like India with a multitude of companies at different stages of adopting industry 4.0 must be a challenge.

Sami, can I turn back to you again? You are also an innovator. In your view what factors make an environment conducive for adoption and implementation of industry 4.0? What are the necessary preconditions?

>> SAMI HADDADIN: Yeah, I think it kind of connects over to the first part that I was trying to answer in which kind of connects the dots which is entrepreneurship. The ones who really know what technologies is what is possible, what is lead to and I think this really boils down to the fact that we need not only experts, highly trained experts which have obviously vast industry experience, they are well trained. They know their job. But we also need talents. We need the best talents that we can kind of educate, we need to really take it very serious that is this is a change in the way we want to do technology, the change that we want to fuse especially in Germany we have very classical let's engineering country. So we really need to take it very serious how can we get together engineering and computer science. These kind of classical templates where we are need to fuse the way of engineering and computer science. And this is extremely important also for the kind of transformation we see from classical computer science that disruptive Silicon Valley. We need the perfect fusion in engineering and computer science. And this kind of also influences a lot of what kind of entrepreneurs we will have in the future and are currently being educated and coming to the market. A very important aspect also is because this is such a huge hurdle and kind of the way that we do industry nowadays or that we will do industry in the next decade is also the financial aspects. So in order to really bring these cutting edge ideas towards the market we need to have much better access to venture capital, to large capital resources that we can really bring very complex technological solutions from basic research and technology towards products. That's another thing that's really important and it is a very hard thing in industry

because the standards are much higher towards the fact that you can bring it to market. You cannot -- there are safety and regulations and there are compatibility issues. So we need to take care of these aspects and coming back to education research aspect it is entanglement between research, education and industry and how can we gsh we all talk about digital natives worldwide. So the young guys who know how to program how to use apps to develop, develop app systems but we also need robotics automation natives, industry 4.0 natives. You call it whatever you like. But we need to make young people and also we need to work on really integrating also and making young women and children with aware of the fact that this is a very interesting career opportunity for them and make them aware that this is a very, very interesting way of realizing yourself and realizing something that is truly unique and special. If I look at the Developing Countries there is also a lot that has to be taken care which we have nowadays in Germany. How can we educate workforces and make them aware of how you use the tools and how can you become a worker in the last industrial phase and how can you make them aware how to use it, how to make very efficient and not be afraid of that. So the education part is a very important aspect there. So it is a whole bunch of things that we need to take care of and I think this is what drives innovation. Getting all the classical engineering people onboard with having the disrupt ion that is coming from computer science and ICT technology to the next generation of industry.

>> FRANK VAN ROMPAEY: Innovation startups that are closely linked. This brings me to Sebastien. How do you see industry 40 affording the industrial refr lugs impacting on technology startups?

>> SEBASTIAN DIAZ: Thank you. So first of all if we understand that a startup is a new business that was just born, I'll say that in startup is a part of revolution 4.0. So I believe that the main challenges are not for startups but for the big corporations. Right now as Sami was saying if you want to bring innovation, you need to bring more enreprenurs in to your company and ecosystem to make those changes in big corporations. Small analogy, if ask the six-year-old child how to use the Internet he is probably going to teach us all how to navigate and in to different websites. The same with startups. The big challenge is for the big corporations and how they are going to incorporate those startups in to the programs that they have inside their companies. So right now in Chile and in mainly in Latin America we are seeing an interesting phenomenon in the market. Right now we are moving

if we see all the startups that we have, especially in Chile, I'm going to take a couple of numbers out of startup Chile program because in Chile I will say that we are the program bringing more start ups in to our ecosystem. We are moving and we are seeing now different startups coming to Chile with a B to B model. And that's telling you that the big corporations are opening down there in Chile to see those startups to solve their problems. If you understand the Latin America market you will see that big corporation has traditional. It is hard to innovate from coming from inside this big companies. So the things that the startups are doing down there in Latin America are not only bringing new businesses and new solutions and more innovative solutions. They are changing the whole court we have in the country. As I was telling you we are seeing in the portfolio close to 30% of our startups are with that B to B model. People around the world that are creating new business they are seeing a huge opportunity in the Latin American market to bring their startups and offer those solutions to the big corporations. So say that startups should be mindful about the huge opportunity that we have and big corporations should be mindful about that opportunity to work with that startup in particular. If they don't do that, they are probably going to lose the chance to join this new revolution.

>> FRANK VAN ROMPAEY: Thank you. I have a follow-up question later on and I will come back to you later on out of respect to, you know, these B to B models. But let me first go to Ratika with respect to the impact that the 4.0 industrial revolution has, bringing it to the higher level. Ratika in a country like inld India how do you see the risk that industry 4.0 might pose on creating a dual structure, a dual economy? You have a developments regional level in Bangalore that everyone is aware of. On the other hand, you also have the developments or, you know, best dynamic developments in places like Orissa. Earlier on you referred to industry 4.0 and its co-existence with lower forms of industry if you so wish. But how do you see the impact of industry -- of this new industrial revolution on the economy at large in India? And the risks that it brings?

>> RATIKA JAIN: I'm somewhat of an optimistic and I think that inequality is an issue that India has been dealing with for long. And at the same time technologies probably the one catalyst that has helped create leap frog opportunities for the economy and therefore there is a fundamental view that technology can actually help India to achieve its developmental objectives. And I think the most compelling

point example I can share is if I look at what's happened with the mobile revolution in India, the late 1990s telephone density in India used to be less than 1 and in a span of a decade it has gone up to 60% and it has just changed the entire life and economic model for a host of people, especially at the prover beual bottom of the peer ra mid. A fisher man out at sea knows which part to land his ship so he can maximize the monetization of his haul which was not something he could do prior to these technologies. So we see, you know, despite ill lit ratesy existing many connecting technologies coming together to help people bridge some of the gaps that they were traditionally facing and if I look from an industry 4.0 perspective I would say that it is important that we don't look tat it as binary. That, you know, it is either good or bad or that we get in to 4.0 or no 4.0. I think we need to look at it as continuum. As long as we are able to improve the welfare of the society that it is impacting we are all collectively better off. So, you know, if I were to be look at it in India we are going to see clearly and we have many discussions on this we will see the co-existence of industry 1.0, 2.0 and 3.0 and 4.0 and economics will really decide how and when industry will actually get on to this journey. I see a situation where a lot of larger companies will drive their supply chains to come on this bandwagon and we are seeing a new, you know, sense of entrepreneurship kicking in. The Government of India has actually launched something called a startup India program. It is to encourage many more startups because I think one thing that the Government is extremely concerned about and naturally so is that annually we have 12 million people entering the workforce and that's a large number. You need to create adequate opportunities and therefore, you know, one of the things that's also coming out is these are technologies which will be completely disruptive in nature. How do we create new economic opportunities, new models of growth and therefore we are -- see many entrepreneurs using some of these technologies, using 3D printers and using robotics to create customized solutions and I think one of the disruptions that industry 4.0 is bringing in is something called mass customization and it is more biassed in that sense towards a smaller entrepreneur as opposed to an additional large scale enterprise. So I think we will see a tremendous change in the economic and the manufacturing landscape globally as we go along. That's my sense.

>> FRANK VAN ROMPAEY: We will come to you in a moment. So basically try to think of some interesting questions to the

panel. There will be a moment for Q and A. But before we come to you, I would like to have a follow-up with Sebastien. I told you I had a follow-up question. Global knowledge that works our crucial part of industry 4.0 and the innovation process. Now how can this -- the -- how can everyone has benefitting from a more agile and more innovative. Given the likely disrupt ions and the possibility of reshoring manufacturing operations. How could industry 4.0 negatively affect this global knowledge networks? How do you see that? Earlier on you mentioned that an important part of your business is, you know, this B to B startups. How do you see the likely impact?

>> SEBASTIAN DIAZ: There is a huge opportunity. Collaboration is the key of the industrial world revolution 4.0. We can see that every day. As I was telling you before startups are the center of this revolution from our Point of View and if we see where our startups are born we can see that they are born in cowork spaces. You can see different start ups, different industries and cultures working in a different place. In strtup Chile we have more than 80 countries represented in our portfolio and you can see that somebody from Germany sit with another person from India. You have right next to you the person that's going to help you to do that. So in terms of collaboration I would say that it is going to be the key for the next revolution. Startup Chile, if we take a startup Chile of an example of a public policy regarding collaboration was born exactly to do that. Startup Chile is a great example of public policy made with a little bit of money. The whole acceleration program we have for startups are made with 0 budget. We don't have any money to pay for that. The entire system that we built in Chile is based on collaboration. That's what we call it -- you are probably familiar with the open innovation concept. If you want to bring more innovation in to the companies or Government whatever, you need to go out there to bring more people diversity, different cultures otherwise it is going to be impossible to innovate in that institution or company or whatever. So in order to do that the Chilean Government created to start to collaborate with other countries and that way we start to connect all the key Actors around the world to start making that open innovation model in our country. Take startup Chile as an example, we have that open acceleration model. We don't pay anybody to be part of our program. So the entire system is based on collaboration. Another example of knowledge transfer and collaboration taken as an example of big corporation and our Government is Amazon. Amazon is based

in Latin America and Brazil that's the biggest country we have down there. But right now they are going to open a huge office in Chile. And why they are going to do that because they understand that Chile is it going to work as a platform as a technological platform to go to the next countries in Latin America and then to the rest of the world but obviously we don't have enough workforce to work on those kind of industries or companies like Amazon. So in order to create more people that are going to be able to work in those areas, we need to connect people working in Amazon with people that is in Chile. We need to connect workers in Amazon with Universities, they need to teach our people how to work in those areas. So that's the only way that we are going to have workforce that is going to be able to work in these next revolution. So here we see a huge opportunity of collaboration between the private sector and Amazon and our Government and also a key role that Universities are going have in the next years. Universities also are going to need to prepare the students or people for this revolution or for the next industries that are going to be born in the next couple of years.

>> FRANK VAN ROMPAEY: Thank you. Very interesting and I am not too familiar with Chile but very enticing what you are all saying. Certainly it is not a best practice and very good practice. So it leads me to the following questions, shifting gears but tieing it all together at the same time, what are good practices out there. And that's starting first with Sami. What is being done by Germany and perhaps you could refer to also other countries in Europe in terms of preparing industry, Germany is known for its industry industry 4.0 approach led by the Government with the involvement of all stakeholders. So perhaps could you share with us some good practices?

>> SAMI HADDADIN: Very nicely connected to what Sebastien was saying a minute ago about putting entrepreneurships and startups in the center of this whole development. This is one of the core parts where Europe had to catch up a lot and still catching up to be honest, but I think what was really going on in Europe really not only in Germany I think is a European movement has been the framework programs for research that kind of made it possible that we had huge innovation between the countries I mean myself researcher as well I have the pleasure of working with outstanding people all across Europe. And opening these borders to research made tremendous things possible. And I think that one of the core aspects that this made possible was

that we could share our views and technologies and know how and bring together industry community all over Europe that turned in to industry 4.0 movement and it made it possible that we can have track records and startups all across Europe. In Italy, in Spain, in Germany. Many, many start ups are being born and there are lots of things going on in Germany and in north of Germany and they are being teamed up with lots of incubators and team them up with classical OEMs to learn from each other and not just to absorb each other one way. And I think this was one of the main things what was developing over the last ten to 15 years and another and I believe very crucial factor was that we developed all across Europe a very, very intensively collaborating community in the field of robotics. So I think that one of the core technologies that will drive industry 4.0 and is driving industry 4.0 and we heard about the mass customization, the core of this will be the intelligent robotics systems that are being able to do things that were not -- that could not be automated before such as Assembly. So things that had to be manual before. And now we are creating a new type of tool that really enables humans to work more efficiently than before and to work more flexibly than before and at the core of robotics which is relating to what I said before how can we fuse engineering and computer science robotics is the perfect example for that and this is taking the legacy of Europe and in this case even Germany and the future of industry 4.0 meaning the connectivity to ICT topics and fuse them together to a new type of automation systems that really can Democratize automation far beyond Europe and Germany because we can see the cost of these systems dropping down dramatically and we what are also pushing a lot is education of young people. So we are, for example, now robotic native programs we educate children in robotics and not in legal mind storm robotics. So we have children program robotic systems which one year ago you would have needed experts with training of years and doing things that were not possible before and there is a tremendous change that is happening now. And I think this is the kind of take home message I can give from the experiences we have in Europe and in Germany over the last years.

>> FRANK VAN ROMPAEY: Thank you. I hope that this message gets broadcast widely. Let me turn again to Sebastien. This is currently leading edge and bright and sunny but at times some is taking to a fast and dynamic part. How is the situation in Chile to preparing industry 4.0? Does the governments have a strategy? How do you see in?

>> SEBASTIAN DIAZ: I am going to highlight a couple of actions that our Government is taking now. I would like to say that we were late to the last revolution and we cannot be late for the next refr lugs. Our government is investing a lot on startups and a lot of knowledge also. Startup Chile as an example, the Government was creating this kind of experiment to bring people everywhere around the world. Chile is not isolated from the world but isolated from the rest of the Latin America. We have the driest desert of the north and so the Chilean culture is special if we compare it with the rest of Latin America. So in order to change that they create a startup Chile to bring different pooechel from around the world in order to invest in knowledge and have somebody to look up to start new businesses. Another action that the Government took a couple of months ago it was launched by the President on March I believe, it is a visa for people that is working in the technological industry. So, for example, if you want to go to Chile and you want to develop your startup or you want to working technological company you can get a working visa in only a couple of days. If you want to sget a very is a to work in a traditional area it is going to take you six months. Of course, that we cannot compete outside developing country against developed countries that have the industrial revolution as a center of their economy you know. So that's why we have to invest in knowledge and all the people that we are bringing. As I was saying before the Government also needs to work closely not only with the private sector but also with the Universities because is the place where the new talented peep sell going to be born. The main challenge that the Government is having is connecting the private sector with the Universities where the knowledge is and all the public policies that are happening right now in Chile.

>> FRANK VAN ROMPAEY: Thank you. Very interesting and fascinating and I am sure we can hear fascinating news from Ratka as well. What are the policy challenges and issues in India Ratika and how well do you see the Indian Government being prepared for the industrial revolution?

>> RATIKA JAIN: The last three years have seen a very interesting transition in India's economic journey and we are seeing a new vision for the country being rolled out. We have today a host of what I would call national converging missions which are trying to get the country moving forward across a whole host of development al issues from manufacturing to digitalization. We have a 100 million program to digitally connect the country. 20% of that would come from the

Government. And the rest would be from the private sector. And I mean -- and that's just the publicly stated figure. I think as things start rolling out you will see much, much more activity because of the vastness both in terms of numbers as well as the gee, Ogg graphy that need to be covered, 4.0 it means different things to different people in India and I think when we speak with industry many companies feel that they are already on this journey and therefore it is important that we are able to give a sense of what exactly is the true potential. Because these are evolving technologies so you kind of being asked to define infinity which is slightly a complex piece thing to do. So, you know, but having said that, it is probably -- it is important that at least to have a sense of what is the next milestone going to look like for different industries. And I think that is certainly going to be a big piece that how do we get, you know, various stakeholders to under stand what that next milestone is going to be and understand what needs to be done by the various players to actually achieve that kind of, you know, journey and transition. So I think awareness building is a very basic but very critical first step that is, you know, being done currently. There is a massive outreach program which various departments of the Government are actually already undertaking. Just to get various, you know, companies and a lot of them are focused on SMEs to have a better sense of what these technologies mean and is there scope for entrepreneurs to get on to this bandwagon so to speak. Sami spoke quite a bit about education and research and the skilling dimension and as I said that's again a big, big piece that, you know, traditionally India we turn out millions and millions of engineers. We turn out millions and millions of IT programmers. It is going back to what Sami said, industrial 4.0 at the cusp of these technologies. We have talking about cyber physical systems. Hypothetically it is a great sweet spot for India and its capability but the whole idea is getting it all to come together, converge and actually have the right skilling to actually make something of it. So that's going be a huge challenge but also huge opportunity that how does India take advantage of that situation as it is we are seeing a certain piece of traditional ICT technology industry in terms of the traditional offshoring model is Petering down compared to the heavy days of growth in the early parts of the century. So there is a need for reinvention and therefore give en the fact that these are disruptive technologies we will see that kicking in and how do you make that transition for the industry. Some other

challenges that are also kind of on the radar screen is, you know, access to capital, how do you deal with issues related to cyber security which is becoming and I creasing dlet in over walk of life that we are living in, IPR, protection and availability of digital infrastructure, standards and regulatory mechanisms. As we speak the Government has recognized that we perhaps need a new paradigm to address these challenges so the Government is actually in the process of formulating a new future ready industrial policy which will actually try and capture some of these dimensions and put it in to a coherent policy framework.

>> FRANK VAN ROMPAEY: Thank you. Very interesting. Can I ask you a question Ratika,last question before we open up for Q and A to the floor. We have about ten minutes left. I was asked to pose you this question, he is working on India, the persons who put this panel together. What role do you see for multilateral organizations not only UNIDO. Clearly what role is there?

>> RATIKA JAIN: As said it is an extremely exciting time. I think where we are and therefore perhaps more than I can certainly remember I see a situation where multilateral organizations specifically UNIDO given the fact that it sits at the heart of industrial development for Developing Countries is really helping and create an informed understanding of where we are going. I think that really becomes the base and the root of taking this forward as a technological platform. And, you know, and therefore capacity building of small and medium enterprises will be a big, big piece in this journey. Similarly of institutions that will support this across countries and national frameworks. I also know that, you know, organizations like the ILO have initiated work on something called the future of work. And I think a lot of say what perhaps UNIDO could do based on its shall we say understanding of its translation of this new industrial blueprint is actually pass that understanding on to an ILO type of situation to say okay, what does this mean for labor policies and what is the kind of international labor framework that we need to have because very honestly, you know, the paradigm of work that was universally kind of accepted a century ago five days a week, eight hours a day, 9 to 5 is changing. And therefore -- and that's changing because of the kind of technology industry 4.0 brings to the table. ITU would play a huge role in terms of what interoperability standards that machine-to-machine kind of framework would need to enable. So these are just I think some of the examples but it is a tremendous opportunity I would say for really the

global multilateral community to kind of support the global transition for this process.

>> FRANK VAN ROMPAEY: Thank you very much. We have taken good note of this and will be keenly working with and with others. Would Sami, Sebastien have some particular comments to make on this question of what is the role, what do you see as a role for multilateral organizations.

>> SAMI HADDADIN: This is the core of it and I think I can only add on top of very little comment, that maybe comes from technological viewpoint and that I think it was really important is to transfer knowledge to transfer technology from the places in the world where we have certain advantage at the moment but really the open their distribute the knowledge, distribute the technology, make it accessible, make people aware of what is there, what is not there. What is possible. And what is not possible. That's also very important because they can be very vast investments in to things that might not be ready yet despite we have the impression they could. I think it is real little important there is connecting the dots in terms of getting information flows back and forth around understanding what concepts could be transferred, what could not be transfer pretechnological wise and really understand what is there that could be made use of as early as possible and what is the further down the road for, for example. This is what I would like to add on a very short notice.

>> FRANK VAN ROMPAEY: That's a little challenge. But looking forward to working with you and others in this field leading to basically bridge that existing divied at present. So thank you. Sebastien.

>> SEBASTIAN DIAZ: Some of the same knowledge transfer is important. Multilateral organizations should work as a connectors. Take this event. Bringing people together from different kind -- different countries, different cultures realities, et cetera. So these organizations not only should connect, but they should transfer what they are learning making those connections. Again let's take Amazon as an example. Since I took that example they should -- Amazon is everywhere. Not in Latin America. You can find offices everywhere and the entire knowledge that they have in those particular industries where Amazon is working and they have the knowledge and they can have to transfer the knowledge to the societies where they are in order to create more knowledge and collaborate with those organizations.

>> FRANK VAN ROMPAEY: Thank you very much. Time for you. Not that much. But we still have five minutes if I'm correct. Questions. I will start with the gentleman. Please

identify yourself and also inform who the question is directed to.

>> Thank you for interesting session. My name is (inaudible). I'm representing company consulting company. Future laboratory Georgia. The first industrial revolution is not only machines and processes but also the revolution of mindsets. What are you doing a honor you are supporting the changing of mindsets in your countries because people from the processes they are working for someone. They are becoming salespeople and that they are starting the new process by themselves. What you are doing for this issue and how you are supporting that the people becoming ready for the industrial revolution 4.0? . Yeah, thank you.

>> FRANK VAN ROMPAEY: We will take two more questions. If there are any. So perhaps -- this gentleman.

>> My name is Hadi. I'm the advisor to the Minister of education from the United Arab Emirates. Can you hear me? Yes.

>> Some irk us with the sound. Please continue.

>> Okay now?

>> FRANK VAN ROMPAEY: Please continue.

>> It is good, the industrial revolution 4.0 is accelerating much faster. Are we informing the education sector to pop up the new world that's going to bring in ten year's time the world will not be the same for our young generation. Are there any reform on the learning outcomes and the way we teach? Is anybody working that area?

>> FRANK VAN ROMPAEY: Thank you. I had some difficulties with the sound for both speakers. Did you properly understand the questions? Yeah. If there is one more question I would allow one more question and then turn to the panel for responses. Is there anybody with a burning question? I don't see any. Sorry. Please.

>> Thank you very much Frank. Ambassador for lesuto. The key thing is financing. Change of education system, that transformation from institutional to governance to the Civil Society as a sole what model in particular for Developing Countries could try to emulate in addressing these multi facetted issues that are going to be change everything in the next ten years? Particularly also as linked with the ILO as changing all the current workforce in to the new future work. Thank you.

>> FRANK VAN ROMPAEY: Thank you Mr. Ambassador. I will turn now to the panel. They will respond to the questions and I would invite you at the same time perhaps also to make any concluding remarks. Who would like to start?

>> RATIKA JAIN: Okay. So I kind of taken the questions one is relating to mindset and education and one is relating to financing dimension. The first two questions with respect to mindset and education are somewhat related. If I look at the case of India what we are seeing is a different stakeholders today are recognizing whether they like it or not that industry 4.0 as a revolution is here to stay. And, you know, I think industry certainly needs kind of becomes the shall we say the main proponent of but even trade unions is an entity that gets threatened by the onslot of technology and what it may mean recognize these are realities that they need to accept and they also recognize that if they don't accept it, companies will be out of business which anyway means that the workforce which was perhaps there in the past would not exist. So I think from shall we say the key players it is a being understood that this is -- this is here to stay and therefore how do we make the most of it and one thing we often do see in India which I think is an interesting cultural phenomenon is once a change is given, people very quickly make that transition and say okay, we have to take this as a given. How do we make the most of the situation and we see this across the -- I think it is just a societal construct. So I am not too concerned about the embracing of the mindset in a country like India because we will also see -- I think as you see shall we say early adopters seeing success you will see followers coming through and coming to the education system one of the interesting models that India started is something called tinkering labs in school. Where we get schools to work with companies to start tinkering with technologies and tinkering with machines and that's actually changing a lot of the way because I mean the Indian traditional Indian educational system has been fairly structured and slightly antiquated I would say and therefore there has always been a challenge that people coming out of the educational system are not as ready as they need to be for contemporary technologies and I think creating these tinkering labs across the country is changing the way that students are able to look at these technologies and start accepting them, you know, right from the beginning. So I -- again I say it is an interesting model of how do you get that adaptation and the transition happening. Coming to financing, would simply say, you know, economics will always be the biggest driver to where money flows. And once you will have early adopters of these technologies, people will adopt these technologies because there is a competitive and a business rational for doing so and my suspicion is you will have financial institutions also

then supporting, you know, deployment of these technologies because it will be integral to companies being part of global value chains. Economic cycles will shift perhaps with a lab but they will shift over time. So I see the financing also coming through. I don't have any further words to say. I think we have actually nicely captured and I want to echo this piece he connecting the dots internationally. I think that becomes a critical aspect of how I think collectively we are able going to be able to leverage these technologies I mean across stakeholder groups and getting the research communities integrated in to industry will be a critical aspect.

>> FRANK VAN ROMPAEY: Brilliant.

>> SAMI HADDADIN: So I will try to go one below abstraction to maybe envision a little bit the question. I will try to answer the questions from a bit different standpoint. And I think it kind of boils down to one thing, industry 4.0 is not a technology. It is a paradigm. So and I think lots of the questions that I always hear and I'm being part of this discussions then we -- always the question of what is industry 4.0 and what does it mean. How do we take this from an extra concept and to concrete action and they concern very concrete actions and so what we came to conclusion to certain extent was if you think about all industrial revolution they were entangled with certain end devices. I grew up with the PC. When I was in school we had one PC per school and weep could go to a certain extent with the PC technology. The recent device were the Smartphones and app technologies that we saw there and think we need to ask the question what are the next gv ne end devices that caned kind of give us concrete meaning, what industry 4.0 means on the next steps and if I may take the freedom to say what the next end device I would say it is the robotic devices. Smart industrial systems that Act like a tool and that can anyone can program and anyone can use and they can then ask very concrete questions regarding -- give concrete answers to the questions we heard ranging from how do we deal with people hol are workforce. How do we educate them. We need to make them understand how to use how to operate robot and take this as a tool. So I mean how do you operate the screwdriver. You teach them to you who operate a screwdriver and why teach them how do we operate robotic systems and this is something that has not been done in Germany at all. And we work together with unions and societies that try -- that cover education of workforce in Germany in order to make them aware that is new type of end device that you need to know and under stand what is coming next and look for the children. As I grew up with

PC get access to robotic systems for children. I think educate them. Get them to chance. Get the end devices and make them experience the whole thing and let them explore. They are the ones who define what will happen. It will not be us anymore. There is next generation coming. So give them the freedom to operate very freely there and from the financial standpoint I believe if you have a very concrete end device which in an infrastructure ecosystem can evolve and it might be different systems. Maybe also virtual ecosystem around AI technologies and so on and so forth and then it is about finding the right business cases and getting the right hot startups add value and really get it case by case and I think it has to be value driven. It has to be very concrete and help on a very bay have daily basis and executive spaces in some sense.

>> FRANK VAN ROMPAEY: Brilliant and fantastic illustration of your point what you did at 50th anniversary, your robots at display. Finally, not least, last but not least is Sebastien.

>> SEBASTIAN DIAZ: I will keep it short. I am trying to answer three questions at the same time. Basically, for example, what weigh are doing in Chile is that our Government is in vesting a lot in knowledge but there are other key Actors that need to read what the government is doing in our market. If our government is investing a lot of knowledge entrepreneurships and startups and Universities to read that and to get involved in to those new industries. In terms of financial things it is only smart money. You don't need to create new found and you need to use the resources that have right now and try to move the resources to the traditional industries and to the new technologies and new industries that are born right now.

>> FRANK VAN ROMPAEY: Thank you very much. This has been from my perspective a very insightful session. This is truly an expert panel. So I would like to thank you. I am not going to attempt to wrap up and we are over time and we will be preparing a report on in and thank you for having given the multi-national organizations a tall order. Can I you ask dear distinguished participants to put your hands together to give a round of applause.

(Applause.)

>> Thank you very much Frank for moderating an excellent session and thank you very much to our panelists for shedding I think a lot of light on the phrase industry 4.0 and injecting a lot of meaning. But that brings us to the crux of the matter. Our next segment which is about achieving success

at the country level which is really what concerns all of us. So here in this segment we can gP some instructive use cases and concrete case studies that will help to ensure success in achieving SDG 9 at the country level. So please allow me to introduce your Moderator for this session Mr. Filipe Miguel Antunes Batista, second general for ARCTEL-CPLP. Of the Portuguese speaking countries. Over to you Filipe to introduce the session and the panel. Thank you.

>> FILIPE MIGUEL ANTUNES BATISTA: Good morning, everyone and thank you for the introduction. With no further delay let me welcome on the stage Mr. First of all Mr. Joy Tan. Mr. Mohamed Ba who is head of innovation division last but not least Her Excellency, Irini Reljin. Please make yourself comfortable wherever you want to sit. We are in a panel of industry revolution. So let's do it a little bit more -- I'm going to excuse everyone. I have to be seated because my knee is hurt. I am going to do this short presentation and try to hit up a little bit this discussion because we are talking about innovation. We are talking about industry revolution but the things are a little bit quiet here. And from the point I am standing and this -- it will be a challenge for Mr. Ba who will be our keynote speaker who will make a short presentation of a case study. What I look and what I see is that we are all in the same boat. Basically the different stakeholders we are all in the same boat and I believe that every one of you has saw the picture. And we are all running the same boat but every single one of us in our institutions in our functions we are looking in different directions. And the only thing we are seeing by ourselves is our own tip of the iceberg. And we are driving if a huge ocean with several tips on top but we are not communicating to each other. So I think this session is particularly important because that's where we all come together. How to achieve success. And to achieve success is in the only to see the tips of the iceberg. We have to look beneath the sea and see what is beneath that tip. Because the challenges are huge. And the different variables on this equation to achieve the success are huge as well and very right. That's why we are trying to understand now. For I will that I will invite Mr. Ba to make his presentation and we will take it from there.

>> MOHAMED BA: Thank you very much Filipe and thanks to my Distinguished Guests for their presence here and everyone in the audience. This has been an interesting journey na ITU has been undertaking for the past year and a half with UNIDO. Two country studies that I will present we have been working on it in a multi-stakeholder partnership of UNIDO as well as

some support from UNCTAD. I I want to talk go the story of Rwanda. About a year ago we were in front of his Minister and his office. I want to create 50 million -- that's a 5 billion dollar industry you want to create in digital. And the current economy size of Rwanda is 5 billion dollars and I say well, that's probably doable but you will need to do it in five years and ten years and everyone in the cabinet said what you are doing now and you should not be talking about. Fast forward a year after that we have generated and developed a very specific program in digital innovation framework for Rwanda where we went in and started talking to stakeholders and trying to understand what are the challenges and how can we drive digital industries that will be worth 5 billion dollars in the next five years. And this report was launched two days ago by the Minister and this is his statement. So one of the key things to note here talks about innovation and entrepreneurship coming together and he is talking about how all of it integrates in to the various sectors of the economy. Now I have been to many other Ministers and they are different stories. Sometimes I hear one success story and sometimes I hear if you fix my IT problem everything will be solved and sometimes I have to step back Your Excellency I ay gre. When you talk to the young people and they are actual stakeholders. One is middle income country and one is low income country and one side you have a youth who has totally been demoralized and has all the technologies that we need. It is a beautiful town and you have a young girl there named Ina and she is totally lost in terms of what she thinks she can achieve in life and if you know the story about that particular country I think 30% of the people have migrated since the fall of the Berlin wall. You have a huge migration and in the previous panel we did have a conversation about Thailand. But in this case not only migrating from a region or a subregion of the country to the capital city but also migrate the out. So you have people who have the technologies but they have completely lost. So on the other hand, we have a young guy in Rwanda John and he is an entrepreneur. He got his funding from Silicon Valley and he ends up taking it. Now you have a lot of countries investing in their ecosystem. So many countries also talk about well, we want to be Silicon Valley. It is not necessarily about we want to develop our economy. Or we want to very specifically focus on economies in various sectors that will create jobs for the people in that country. This is a background story want to start with. And I want to step back a little bit and say okay, why are we talking about innovation. Why innovation and entrepreneurship. OECD

definition of innovation says any product and service. How they create jobs, is how they transform processes. ICT has a critical role to play in this and with the new technologies coming in with ICT all of this industry 4.#0 Don -- countries need to understand how everything works together and how they will make it create specific jobs for their economies and for me I'm very afraid when I go to countries and there is a very -- there is a sort of a lack of understanding not necessarily from the leadership but from all the stakeholders that need to come together. So people want to be one of this high tech companies or high tech cities and but for that to happen they are spending a lot of money to train entrepreneurs. We heard from Chile that the Government is spending a lot of money to educate and train and create startups. We heard from our previous speakers about India doing the same. But at the end of the day there is potential that there is leakages to these big global tech ecosystem. And the question is at the end of the day we have one global ecosystems. We have very little trade barriers between countries and ICT connects everything. Once you startup or software company you instantly you a glo global company. You are not local anymore. So what all the stakeholders doing? I think is this is the question we need to ask ourselves. And the previous slide I just mentioned briefly about the different economies and how they sort of work. We have several sort of segment of the economy. We have factor driven economy and middle economy countries and but everyone wants to move to this knowledge economy. But at the end of the day every country has a mix of them. But depending what industry and what opportunities you have you will fine-tune your ecosystem and make sure you are connected at globe ecosystem. This is what they are telling us. Entrepreneurs always have very nice stories about how they are not getting the opportunity, the venture capital and the finance sectors are always saying the government is not giving them the right opportunity but at the same time they want Government to give them facilities and tax breaks or they want them to stay out. And in some countries they go as far they don't want any kind of risk capital from government at all because they don't understand that. The problem is much bigger for the country than the actually look at it. And Filipe said this earlier we are look ing at the tip of iceberg. Academia in we know there is a huge problem in Thailand. You can educate a bunch of people but they will migrate to another country. So you are subsidizing somebody else's ecosystem. It is a lot of activities there. And many countries look at this and they

actually have program. They will have one program. We just put in a tech center and they think this will solve all their problems. The magnitude of the problem is much bigger. What I want to talk to you about is if you are trying to encourage young people and you are trying to create companies and trying to create the next growth company we need to understand what are the chances and opportunities thissy will create some kind of industry 4.0 high growth company in your environment. And what we do during our studies and the results that I will show you is we look at several pillars. Of course, the vision and how everyone aligns it is very important. Traditionally organizations like ITU has been focused on one element and we talked about broadband but the reality even today the broadband commission is talking about 450 billion dollar opportunity for broadband but nobody really knows Lou to deliver that. But it is really not about the broadband. Its about what is happening to create the services so the infrastructure and the people who need to use the infrastructure can come together. And for that to happen we need everyone. We need the private sector and we need finance and Government and we need academia and we need new business models and, of course, we need the startups. Thailand, the entrepreneurs that I talked about earlier, John has this company registered in Rwanda. But he lives in Kenya. He is using money in ra da to go to all international events and markets. Eye trying to say the situation is much more complex than everyone realize. Now they had a lot of people in Kenya tho goes to kaen ya for business opportunities but they have the companies registered in Rwanda. Why? Because it is easier for them to do that. So you see this sort of disparities between different countries and this is how the global ecosystem is connected. So if you look at the case that we have seen for a low income factory driven country like Rwanda when you hear there is money issues but money doesn't solve everything. Its no, the about money. So in the particular slide that you see you can see that we have a lot of young people they are engaging in some problems but there is a systemic issue with finance. Now Rwanda has made a lot of great progress in this. If you look the latest report that we launch about this is they have actually been able to establish 100 million dollars VC fund and able to establish a lot of programs to stimulate and foster entrepreneur and also recognize that it is not just about one of these boxes. And the Ministers only words we know that we have 35 boxes and from our Point of View is we just want to make sure that any sort of digital innovation framework allows us to continue to

make our ecosystem better. So the first sort of report and review in partnership with us but we have also empowered so they can continue improving that ecosystem. The next case that I want to bring up is a middle income country and in this case you have a gotted manufacturing sector but the problem is this manufacturing sector most of is industry 1.0. Some of it is industry 2.0 but the reality is that there are other competing countries in this neighborhood who are actually starting to take businesses from this country because we know competitiveness is not just limited to one area. If we don't go and improve and under stand the systemic change if we don't go and create more success stories and if we don't provide support system, people who can do the innovation start working with private sector then we know that the chance also not happen. I think earlier we heard from I can't remember who I think it was from startup Chile where he say if you look at this construct some of the innovations actually start in coworking space. If you don't have enough coworking space in the various regions of your country where the country and business and solutions does not need to -- you are not going to have chance to create an industry that stays and remains. At the end of the day there is a clear need to understand how all of the digital ecosystem is working with all of the other sectors. If in your countries low income and factor driven. There has to be a specific digital policy that is fostering digital industries in agriculture. And this cannot just be a digital policy where we are putting basically government services or making sure that the agricultural ministry has Government services and the fact is that today most countries are still at that under-Staning. We are goes to put computers and digitize but we are not going to digitalize. Make sure your ecosystem has all support systems that all of the stakeholders and various ministries that working together and best way to put it is in this future proof industrial policy that was brought up our previous speaker. At the end of the day all of our studies for these vary countries we have been involved tell us one thing. There is need to update ICT policies so they are more in line with industrial policies and this might account like the future proofing industrial policy that was brought up by the previous speaker and what we are deciding to do now and take our relationship further with our multi-stakeholder partnership especially with the UNIDO is to go in in country implementation where we can now dooifr in to the specific and bring full mull city partnership to make sure we development specific con strublgt where we can help guide innovation activities in a country. Where we can help build

innovation capacity. We developing and future proofing sandboxes where these technologies that are needed will be trarns formed in to solutions locally and last but not least we are working to create new program and supporting mechanisms that are specifically focused on building the digital industry. With that I want to end this presentation with a wisdom from our SG, basically he talks about how there is a growing digital innovationdy individual and we believe this digital growing innovationdy individual is responsible for the digital divide that exists and we need to fix this for it to really start changing the direction of countries and, of course, from our director of the -- of Telecommunication Development Bureau innovation has a critical role to play whether it is public service transformation or whether it is transforming the economy as a hole. Come to WTDC and contribute to discussionance sharing experiences with our countries at our next Plenipotentiary Conference in Buenos Aires. Thank you.

(Applause.)

>> FILIPE MIGUEL ANTUNES BATISTA: Thank you very much Mr. Ba. Very clear as usual. I will move on to the panel and put some questions. I think the best image that we can get from this panel and this discussion is the idea of having to look to the big picture. And to find the correction tools to enable us to move forward and achieve successfully the industrialization or the digitalization of the industry in our countries. Just yesterday just to mention Mr. Houlin Zhao presented the new toolkit developed by the ITU that will help bridging the digital innovation divide to the countries that need to have or to share this vision, to have a vision of a big picture of the needs that we have to take on onboard in order to ensure the success at country level. With no further delay Your Excellency I would like to ask you, do you in Serbia have a clear view of the all the icebergs or you are looking at the tip? In other words, is it Serbia ready to create the digital industries in.

>> JOY TAN: I believe that we have. I would say that the most important thing is that you have human resources and, of course, we have them. We have very good education our mathematicians have medals in the world Olympic games each year. (Irini) and they are busy and employed in different companies in Serbia and most of them unfortunately go abrupt. We have a lot of startup companies. I will say hundreds of them and they are usually founded by young engineers. Sometimes they don't even finish their University. In fact, I'm coming from a University, and chief of the Chair for

telecommunications. I'm University professor. So I know their problems. Sometimes they don't finish the University they go to -- they are employed in different foreign companies. First startups have been founded by foreign companies and now we have small companies founded by our engineers our small -- our young engineers and also our young I would say professors at the same time. Their companies we wouldn't say are only small and medium. They are at least medium and sometimes huge companies. They have over a few hundreds of employers up to thousand of employers. Some of them have been bought by different foreign companies like Schneider, for instance. They bought a company with 900 engineers to deal in software for power distribution systems which is very good and employed everywhere in the world. We also have a companies to deal -- using video games and then software for multimedia. They are producing it and giving design. For instance, all companies involved in the multimedia. They have set top boxes, parts of TV sets and whatever. We have successful in what part. Unfortunately we are not successful in all technologies. In fact, we had in past we had a companies electronic companies that were producing different stuff and they had, for instance, over a hundred of employers over a hundred thousand of employers huge companies due to our past history. They don't survive. And I think that sometimes it is okay because we have young people which are working and probably a few of the old ones or they are -- retired or they are working with young people. So they went to software engineering. We are working very much on helping and supporting the startup companies and our strategies that are completely in line with the things that are going to be developed in Europe at least because we are working hard to cover and devoted to Europe and integration at the moment.

>> FILIPE MIGUEL ANTUNES BATISTA: One point has been one of the challenges in every country is which is related to brain drain. Yes. And the challenges that Government face when big companies like Huawei come and take our breath away to work and now a question to you regarding this idea of brain drain and especially related to research center of Huawe I. How do you in Huawei see this topic of the research of researching and R&D and in more concrete how does this factor goes in to our Huawei efforts to engage with governments in creating policies of necessary ICT structures and how you balance that avoiding the brain drain in those countries. Thank you.

>> JOY TAN: For those who are not very familiar with Hua

we i I we have an ICT solution provider to about one-third of population in the world. We provide network solutions to large operators like, you know, British telecom, Telefonica and Deutsche Telecom and we manufacture Smartphones. We are the third largest Smartphone manufacturer and we have a new business. We provide data processing storage cloud to small medium businesses. So this is a very new segment for us. We are Huawei is a large company. We have 180,000 employees worldwide but we really focus on research and development. Almost half of our employees are dedicated to R&D. So we have actually the largest R&D workforce in ICT industry. So how do we do that? Again Huawi is have very large company with you we are a very young company. We have 30 years old. For the -- since the very beginning we have been focusing on R&D by dedicating at least 10 percent of our annual revenue in research and development. So overall 11 billion dollars just in 2016 to R&D. So I think that's the focus we have been doing for all these years just continues commitment to research and then put that funding in to that. I think, you know, during just the downtime in 2000 a lot of companies actually reduce their R&D funding but Huawe on the country increase our R&D investment. We really believe innovation and R&D is like a marathon. It takes long-term commitment. It is not a sprint. Because if you just invest quarter by quarter in to R&D that's not going to work. You have to have that long term vision to invest. Currently our R&D investment probably 70% goes in to the product and solutions that will generate immediate commercial benefits for the next 12 to 18 months. And another 30% of the R&D investment will go in to a research for fundamental science and technology that's 5 to 10 years down the road. A lot of companies don't have that commitment or that long term vision to invest for ten years down the road. But as a private company we can -- we have the resources we have the focus to really focus on material like -- focus on science like mathematics algorithms. They don't necessarily generate immediate benefit but five to ten years down the road it will benefit the human society and that's the kind of principle we have for R&D for innovation. And in terms of, you know, collaborating with Government and standard organizations and academia we really spend tremendous efforts on that. We work with over 300 standards organizations around the world and we have research collaboration with 200 Universities around the world. With Cambridge and UC Berkeley and we work with these schools to fund some other research programs and then we work with particular professors as well to fund their research. And

then we also have this sees for the future program where we bring students from over a hundred countries to China they can learn the chi nez culture and they can learn ICT technology on your campus as well. When they go back to their countries they bring that ICT technology -- the knowledge to their own countries. So that's kind of the involvement we have with many different partners around the world.

>> FILIPE MIGUEL ANTUNES BATISTA: Very impressive and I think this is music for Mr. Ba's ears and this was the kind of statement he was trying to address in terms of bringing every stakeholder together. What we saw from the example of Huawei they can draw lines since the beginning to the end and try to bring up all the pieces of the puzzle together. This is what we are trying to say when you need to have a more collaborative work between, for instance, UNIDO and ITU. Did you have a comment on this? Is it possible to copy/paste this approach of Huawei to the public sector?

>> MOHAMED BA: I think it is a lot of things in private sector than public sector. Public sector has different incentives and that's just a reality. But I think what I want to bring it back to in the previous panel there was a lot of discussion about mindset and culture. And this mindset and culture really needs to change. Because we know it is imperative for innovation if you don't do it somebody else will come and take your business and we have heard from Her Excellency from Serbia where many of their industries have closed and this mindset the awakening of the various public sectors administrations to actually start working and gathering and guiding the various stakeholders so that they can sit together and understand what vision do they want to solve for a country. And this has to include both the domestic companies as well as the international companies. Now during our research we have seen a lot of good examples. For example, in Thailand there is one bank. Cash gone bank says we have a lot of challenges with our customers because our customers are SMEs and we are going to take a different approach and what were some of the challenges because they see which are from China coming in offering financial services to their SME and going trying to understand what do the SMEs and their customers need. So they decided they will take an aggressive strategy against that. And I think it will be interesting to understand from Huwei when they are doing in similar ways especially when it comes to growing the regional ecosystems in various companies but in this particular kaus gist to finish the story what they have done is take the IT department, spin it out in to a separate entity and start

having their IT department work with all these new tech companies and startups and start offering B to B services to their customers. So they went from being an offering financial services to actually B to B services to their customers and being very aggressive about it. Now we are have seen other communication companies do this as well. Telefonica is actively work with the ecosystem. And, of course, there is always an interest behind but at the end day when weigh Juned stand is that all the stakeholders have tho have an active role in this. This means that private sector really needs to step in and start working in that and I believe we heard Huawei is doing a lot of that. Especially around SDG 9 but I will leave that up to --

>> FILIPE MIGUEL ANTUNES BATISTA: We have tackled two of the Is that are included in this SDG. For instance, in Serbia is there a hugely difference between the infrastructure systems in Serbia comparing to the other countries in Europe?

>> IRINI RELJIN: Comparing to the number yes, it is but our strategy is I would say the similar but I will say it looks like European ones. Next week we will start our public consultation of strategy of neural networks and we have dijal single market as a primary goal and in order to have the valid data we did a huge analysis of the state in the country. And we calculated the Digital Economy and digital society index for our countries in order to find which are very best points in our country and we found that it is, of course, fixed network. It is a huge problem every where because it means a lot of money and I would say the particular success metrics are a problem but we have the best position comparing to European countries and we are on tenth on that list in Europe. In digital integration. So technologies are very well integrated in our country. But unfortunately we don't have a huge success metric all over the country. We have 85% rural areas that means it very difficult to do it. But we have a lot of broadband. Our national company has a project with Huawe I and we have spreading the fiber to the home very exhaustively and we have the same plan with our ministry and to develop, for instance, for the rural areas where you don't need you have age of our population is very bad. The average is 45 years. So this is -- we have a lot of people young people going abroad. We don't have newborn children so much. So huge numbers. And because of that we have to do something for this old villages. I would say. And we will try to do it in this different technologies. So we will open technologies like parallel line communications, like satellite. Probably somewhere where there is enough money for that, for the homes

that could do it. And we will do our best hoping that with our subsidizes from Government, I don't know. We will do it in five years. The strategies will be valid in five years from now.

>> FILIPE MIGUEL ANTUNES BATISTA: Very impressive and huge challenge you have in front of you. Huawei is smiling. I have been following Hua wv ei neP Friday Kay because of the most of the countries that represent are based in Africa. And I was also aware of the strategy of Huawii in terms of all this segment straight ji to cover all the stakeholders in all stages of technology. And I would like to know a little bit more regarding to this process of helping or accelerating the transition to digital industries. What is the Huawei strategy in this term and in particular regarding to the challenge that you may in chi dma since it is a strong industrial based country how do you see the strans formation of the industrial transition from -- for digitalization of the chi nez industry how do you see it from the perspective of Huawei?

>> JOY TAN: In terms of industrial digitalization I want to talk about it from three perspectives. We have to continue to build that infrastructure. That's really the Foundation for building a connectivity and the digitization. So right now there is still about 4 billion people in the world who are not connected to the interfet and there are about 2 billion people who don't have cell phones. There are about half billion people who are living outside of wireless coverage. And even in Europe people with certain connectivity that cover saj probably only 70 something percent and then especially in rural European countries the connectivity coverage is about 40% and then you look at some of the Developing Countries in Southeast Asia and Africa we still have a huge gap in terms of broadband connectivity. So that is absolutely is the Foundation for digitization. So we really want to continue to expand the broadband coverage and for those regions with broadband coverage we want to enhance the performance and bring the speed up for those developed countries and so we are working with many operators around the world to roll off 4G and we are investing heavily in to 5G research. I think since 2012, 2013 we already committed 600 million dollars funding in to 5G research and then we are seeing 2018 some of the Asian countries are on 5G already. Korea, Japan they are coming up very fast. And so braud band is the Foundation and then in terms of industrial digitization we are working with many of the, you know, the industries to help them accelerate this process. For example, also the logistic park monitoring. So we could help them increase their efficiency by 50%. And then

cut costs by 50% as well. So those are some of the impressived numbers that we are seeing by working with different vertical industries. And then, of course, the very important aspects in this digitization process is crowd sector and cross regional collaboration. That is so important. Just like moe talked about this is a full globalization process. You have to have the collaboration. So now to we worked with Nokia one of our peers, right and then we worked with Audi BM wshgs and we formed the first cross-sector 5G innovation Forum. Of this is true cross-sector and cross regional Association so we can explore how we can bring 5G technology in to the transportation industry. And then actually we are working also with SAP in Europe and companies in China trying to bring the industry 4.0 in Europe to China. And trying to figure out how we can simulate this process in China and help the digitization process of vertical industry in China as well. So those are the things we are seeing. China actually I have some statistics China manufactures about 40 percent of the mobile phones and 80% of the air conditions for the world and 91% of the personal computers of the world. Ghi na is the fact Friday tore the whole world. But in terms of productivity it is about 25% of the productivity for developed countries. We have huge room to improve in terms of putting in automation and increase the productivity for all the manufacturers in comi na and Huawi we as a research company we do put in great emphasis in automate our manufacturing facilities and most of our manufacturing but for some of the new products and high-end products we do manufacturing on our own initially and then after the products are mature we move them to outside manufacturers. So if you go to o our manufacturing facility from the beginning to the end you don't see too many people there. You see racks of components and supplies. They retrieved by robots and in the factory they are loaded to the cars and they all by robots and we only have very few people in the factory just do QC and things like that. So, you know, large companies are moving up to higher value of the automation and China needs to do that as well. Not just on the packaging aseemibly part. We need to move up to that high value chain in terms of automation. I think premiere liquidity launched this initiative made in China 2020-25. Hopefully we will see more sophisticated automation in China and like other team members othering speakers mentioned this is not just expanding our automation machines. This is about mentality change. Paradigm shift. Your organization structure and talent and everything yeah. The ecosystem needs to be moved up to that digitization.

>> FILIPE MIGUEL ANTUNES BATISTA: Big picture. It is all set of issues that you have to take in to account. Mo do you have a kment, especially if you can bring something new to the table which is related to the human resources. This revolution and industry 4.0 will bring up a new problem which is the realization of mu man resources. In Serbia they have facing a problem which ICT cannot overcome yet which is lack of new parts. But what will happen to this -- to all these people that are being putting away by this industry 4.0?

>> MOHAMED BA: I'm going to avoid economic sort of speeches but what I can tell you is you have a lot of young people who are very anxious. They are looking for jobs and we are automating all the jobs. And we also have a lot excitement from them. Now we also know that fend depending on the country you find good talents and everything all the innovation ecosystem talent is probably migrating in the top 20 ecosystem that I show you. I think the countries have to look underneath the iceberg and start to understand that one of the key problems that has to work in connection with other problems which is talent, how do you create more of these 21st century talents and how do you create it in short term and long term. Education is completely outdated and needs to be changed there. Short term is about attracting talent from ecosystem but more importantly the key thing is for countries to really start thinking about building digital industries which means they have to build specific programs towards that. Because if you know -- if you do not that then you woebt be competing. I am not going to go in to the political statement about think it was from Facebook, Zuckerberg who said we should start taxing the robots but I will end my comment with that. That will be for the policymakers to think about.

>> FILIPE MIGUEL ANTUNES BATISTA: Before getting in to the audience because I was noticed that we have to wrap up, I just want to know if any of the speakers want to address or had anything else to your previous interventions? Can we go to the audience? So if you please any questions from the audience? We will be taking them now, if not everyone is looking forward to lunch. There is a --

>> Have a short questions for Huawi. My name is -- I am representing future laboratory opening from Georgia. How you are -- do you have open innovation system in Huawei and how using this system to realize competitiveness in the world. Open innovations.

>> JOY TAN: Yes. Definitely we work very closely with a lot our large customers, for example, Brit tich telecom, Vodafone. We have joint innovation centers with them not just

in Europe but in many other places as well. We work side by side so we can under stand their requirements and we can roll out the solutions. We do this joint innovation for -- I have been doing this for many, many years. So that's large telecom operators and we work with a lot of the developers as well. Application developer content developer and software developer. Last year we committed over 1 billion dollars to build in platform for developers so they come in to do joint research and development with us. You test the interoperate ability during the process. We are very much in to open innovation and collaboration.

>> FILIPE MIGUEL ANTUNES BATISTA: Any other questions? No. Everyone is looking forward to lunch. Okay. So we are going to wrap up. I think it is -- it is safe and I believe that is going to produce a small report of this session. But just to conclude I think it is safe to say that we have added another I in to this definition to this concept which is the I of iceberg. We have already the infrastructure. We and we have industrialization and innovation and we have the iceberg which enables us to see the whole picture what we need to do in order to ensure. I want to thank our speakers today. Please join for a round of applause for them.

(Applause.)

>> Thank you very much Filipe and colleagues from the panel. Extremely interesting discussion and thanks for sharing all of the best practices and lessons learned and which is essential knowledge sharing for the achieving SDGs. Thanks also to my colleague Mohamed Ba for presenting the initial findings of the innovation report which has been jointly with UNIDO and Mohammed is from the development bur Roy of ITU and it is my pleasure to invite on stage to address you briefly the deputy director of our development bureau, Mr. Yushi Torigoe.

>> YUSHI TORIGOE: Good afternoon Distinguished Guests, Ladies and Gentlemen. On behalf of Mr. Brahima Sanou, director of Telecommunication Development Bureau it is my pleasure to be here with you this successful special session on SDG 9. A key areas of ITU and UNIDO corporation included supporting the development of innovation, infrastructure, and industry. I was myself together with this Joint Declaration between Secretary-General and Director-General and it is a very important steppingstone. Throughout the session something inspiring happened. High level participation from Government, UN agencies, private sector academia, came together to achieve SDG 9. I thank you everyone involved for your engagement commitment and foresight and all the

preparation. Thank you very much. Bureau of telecommunication development of ITU, and ICT, we have been closely working with partners and Member States to bring together technology and innovation to create synergies with -- which will take us further and faster towards achieving Sustainable Development Goals particularly SDG 9. Previous speaker mentioned my colleague, as for innovation, ITU has in-house knowledge of focused research together in to a new toolkit that will enable stakeholders to analyze their ecosystems and take specific action to start changing the trajectory of their Digital Economy. These toolkit is for you all Member States industry players academia to use and refer to it. ITU-D continues to implement on update online ITU interactive terrestrial transition maps to show policymakers and investors the missing links in terrestrial transmission. The maps are cutting edge ICT mapping platform that features national backbone connectivity. As of 2017 the maps contain information interconnecting high speed network providing 184 countries. I'm promoting ICT infrastructure and ICT application is sort of two sides of the same coin. ITU-D has been harnessing the power of mobile phones and Mobile Applications to deliver wide range of services and information to the public. ITU-D has immensely contributed to the rapid growth and expansion of telecommunication ICT networks and services to assist in the area of health, education, agriculture, employment, and disaster management. In close collaboration with other UN agencies, of course, UNIDO, WHO, UNESCO, FAO, and ILO. Finally taking this opportunity on behalf of the director Brahima Sanou I would like to all invite to this World Telecommunication Development Conference to be held from 9 to 20th October at Buenos Aires, Argentina. This event will provide a unique platform for both sharing knowledge and experience and public private partnership and it will et set up the priorities which will define the future of ICT sector itself. So I'm looking forward to join us at the Buenos Aires. Taking this very important special session will be a very good steppingstone for promising future lies ahead of us. Thank you very much.

(Applause.)

>> Thank you very much Mr. Yushi Torigoe for those remarks from the bureau of telecommunication development which, of course, is the part of ITU that's very much focused at the country level capacity building and programming which is very much the focus as well. The ultimate focus of this special session. So now Ladies and Gentlemen, we are coming to end of a long morning of discussion around this most

fundamental of SDGs SDG 9. We have heard from all sectors from the global to the national perspective. And to wrap it all up for us and help us synthesize and I am delooigted to invite on stage Fatou Haidara, the manage director of policy and program support and dreblgor of Department of Human resources UNIDO.

>> FATOU HAIDARA: Thank you. First of all I would like to thank ITU for inviting UNIDO to give the closing remarks for this special session on SDG 9 and industry 4.0. Of course, I'm very privileged to be here today representing UNIDO. I would also like to express our deepest gratitude to the participants who have chosen to be with us today. I know I am between you and your lunch. So I will try to make it not too long. Although it is a challenge because this was a very rich event. You UNIDO and ITU have led the strong Foundations for a dynamic partnerships that aim to ensure collaborative action in achieving SDG 9. These Foundations are built on understanding and valuing the roles and capacities of one another providing a platform for complimenting our mandate and thus allowing us to efficiently and effectively draif digital transformation. I listened with great interest to the very dynamic and informative sessions which have shed light on some of the key challenges faced for success iment plimentation of SDG 9. First session explored different alternatives and modalities to leverage multi-stakeholder partnership for achieving SDG 9. The representative of the World Bank Mr. Jos Verbeek intervention highlighted the importance of investment and innovation for growth and promotion and how wn the framework of the 2030 Agenda for sustainable development partnerships are going to be a crucial driving force in order to overcome development challenges. It is impair tifr that we are mindful of the conditions ensuring the ICT sector can contribute to sustainable development as well as the relevance of connectivity and the challenges faced in addressing the digital divide. To this end the session on digital transformation for sustainable development in the context of SDG 9 was able to provide valuable insights in particular the indications that the structural shift towards more innovation and technology oriented production will be partly data mined by the exchange of knowledge and technology by enhancing networking and cooperation. Additionally it is clear that the integration of digital technologies puts pressure on private sector and Governments to adjust business models and regulatory frameworks. Other challenges needs to be addressed include a lack of data inadequate skills sets, a lack of physical and digital infrastructure, and limited connectivity.

This is especially true in Developing Countries and economies in transition. Consequently only a coordinator effort can tackle these challenges and the UN development system as a particular vitally and unique role to play in to support Governments to overcome these challenges. Dear participants the international community now recognizes the large number of opportunities for growth offered by digital transformation and interconnectedness and new manufacturing technologies related to industry 4.0. New businesses new business model are being driven already by this new elements. Thus advocating for a sustainable and efficient use of limited resources and cost effect five production of highly proiks denoting and unprecedented transformation in industry, flexibility and agility. The session on preparing the first industrial rove lugsed offered a global perspective, such as strategies for industry 4.0 the different factors that facilitate the adoption and implementation of industry 4.0. We learned in this session to transfer to industry 4.0 it is essential bringing together all local stakeholders to find the right combination for markets and as every market is different and may require alternative solutions. It was also underlined today the key role of knowledge exchange and technology transfer. Specific and well designed learning exercises are needed to better understand the key essence of industry 4.0. Within the landscape international organizations like UNIDO and ITU can provide the expertise they can facilitate technology partnerships and working towards building inclusive and sustainable industrial platforms. The last session focused on ensuring success at the country level, guiding innovation activities at country level is a key challenge. The case of Serbia revealed how important it is to create spaces for experimentation and technology transfer in order to allow innovation, to move from research to commercialization. The presentation of the country case studies recognizes ICT infrastructure as one of the major building blocks for industry 4.0. There is a need to align ICT and industrial policy with a view to increasing the preparedness of industry 4.0. This elements certainly underscores the importance relationship between UNIDO and ITU.

As indicated during this session we should work on innovative approaches that build on a cohere reasons vision, strategy and programs to support and direct the policy it create the framework con due si to both industry 4.0 and SDG 9. In this regard and speaking about ensuring success of country level please allow me to mention UNIDO's flagship initiative called program for country partnership. A

partnership model which aims at mobilizing external partners and additional resources to achieve larger development impacts. The PCP is now being implemented in three countries. Ethiopia Senegal and Peru. This week we will announce officially its of -- it was announced official I that Turkstn will become the first country to launch PCP. Large scale industrial infrastructure for projects. The UN development system is at the critical -- crucial moment. The 2030 Agenda for sustainable development offers enormous amount of opportunity for action to all Actors. The SDGs are transversional in that nation. Affects the ability to achieve another SDG. We are fully aware of the great impacts we produce when we coordinate our respective expertise. This is why we can say that by implementing SDG 9 we are implementing the 2030 Agenda and other SDGs. Because the 17 SDGs and their related 169 targets are so closely interrelated. As mentioned previously this session is the first step to materialize the partnership between UNIDO and ITU. Our intention is to operationalize this partnership through a memorandum of understanding. This will maybe take place during our 17 session of the our general conference for which we are delighted to invite our ITU colleagues to join and concretize our partnership. We believe this is the right way to go. The United Nations should continue playing its convening role assisting to overcome the challenges discussed in this special session and we stand ready to work with international fora. Governments and businesses to realize the potential that innovation technologies have for the achievement of the SDGs and I am convinced that together we will be able to successfully achieve the 2030 Agenda. Thank you very much for your patience.

(Applause.)

>> Thank you very, very much and sincerely for an excellent summary of this morning's proceedings which I believe really cap pureed all the of the during all of the discussions and I arguably one of the most difficult tasks this morning to be able to put all of that together while listening to the panel and the speaker. So thank you very very much for being here today and delivering those closing remarks. I want to thank as we close the session all of our excellent speakers our panelists our Moderators and thanks especially to the audience for your active participation and attention and for staying with us throughout the morning. It has been a very long morning but we started on time and we are finishing just two minutes over time. So I think we should get a WSIS prize for that. Despite all of the packed agenda

we have managed to finish on time. Do not hesitate to contact us at ITU or UNIDO and we will be delighted to see how we can work together because together we can get things done. Thank you very much and enjoy your lunch. Thank you.

(Applause.)

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