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WEBINAR

HOW CAN DEMOCRACIES HARNESS TECHNOLOGY FOR INCLUSIVE ECONOMIC GROWTH AND DEVELOPMENT

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Welcome:

JOHN R. ALLEN
President
Brookings Institution

Session I - Digital Development

MODERATOR: GEORGE INGRAM
Senior Fellow, Center for Sustainable Development, The Brookings Institution

HANNES ASTOK
Executive Director, Estonia e-Governance Academy

PARAMOD VARMA
Chief Architect of Aadhaar, India

CHRIS BURNS
Chief Digital Development Officer, USAID

KATE McGOWAN
CEO, Digital Impact Alliance

Session II: Technology, Inequality, And Public Policy

MODERATOR: ZIA QURESHI
Visiting Fellow, Global Economy and Development
The Brookings Institution

FRANCOIS BOURGUIGNON
Emeritus Professor of Economics, Paris School of Economics
Director of Studies, Ecole des Hautes Etudes en Sciences Sociales

NORA LUSTIG
Nonresident Senior Fellow, Global Economy and Development, Brookings
Samuel Z. Stone Professor of Latin American Economics
Director, Commitment to Equity Institute, Tulane University

DEEPAK MISHRA
Director and Chief Executive, Indian Council for Research on International Economic Relations (ICRIER), India

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MODERATOR: PRIYA VORA
Nonresident Fellow, Global Economy and Development
The Brookings Institution

ISOBEL COLEMAN
Deputy Administrator, Policy and Programming
USAID

Session III: Disruptive innovation and the Fourth Industrial Revolution

MODERATOR: LANDRY SIGNÉ
Senior Fellow, Africa Growth Initiative
The Brookings Institution

ROSLYN DOCKTOR
Vice President, Technology and Science Policy and Vice President, Middle East and Africa, IBM Government & Regulatory Affairs

STEFANIE M. FALCONI
Co-Founder, Instituto Limite

LOUISE FOX
Nonresident Senior Fellow, Global Economy and Development
The Brookings Institution

LISA WITTER
Co-Founder and Member of the Board, Apolitical
CEO, Apolitical Foundation

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P R O C E E D I N G S

GENERAL ALLEN: Good afternoon, everyone, good morning or good evening, depending on where you're tuning in from. Thank you for being with us today for this important set of discussions on a pressing topic of how democracies can harness technology to promote inclusive economic growth and development.

We know that advances in artificial intelligence and other technologies hold great promise to boost economic prosperity. But they could also worsen economic disparities and even undermine democratic governance. We also know that as these technologies transform business and work, they are shifting growth and distributional dynamics in major ways in both advanced and developing economies.

We also know that they're economic and social implications are profound in harnessing the potential for today's technological transformations to build inclusive prosperity. Democratic societies have to answer important questions. How can digital governance advance equity and provide essential services for all? How does technological change contribute to the current rise in inequality in many countries? And what are the implications for public policy? And how can disruptive innovation and the Fourth Industrial Revolution in Africa and the global south accelerate inclusive economic transformation and quality job creation, especially for youth, women, and sustainable development.

Now Brookings scholars have been hard at work addressing these questions as part of the Brookings Global Forum for Democracy and Technology. Which is a multi-year effort to address how democratic societies can govern advanced technologies in a way that reinforces liberal norms and values while out-competing authoritarian models. And one pillar of that effort is technology and inequality, which includes multiple work streams on the questions that I've just highlighted.

So I'm delighted that we'll have a chance to share some of that research with you today. And we've assembled three separate panels of policymakers, practitioners, and researchers to discuss the complex relationship surrounding democratic societies,

technologies, and inequality. And I'm thrilled that Isobel Coleman, Deputy Administrator of USAID has agreed to join us this afternoon to share her thoughts on these important issues and how her agency is addressing them.

We hope you'll share your views too and pose your questions by tweeting with the hashtag TechforInclusiveGrowth. So with that, thank you again for taking the time to tune in today, and we're very grateful for your interest. Good day.

MR. INGRAM: Hello. John Allen, knowing the potential of technology to advance but also undercut inclusive prosperity and democratic societies, sets the frame for today's forum on technology and inequality.

I am George Ingram, senior fellow with the Brookings Center for Sustainable Development. Welcome to the first of three discussion panels. The first one, focused on the role of digital identification and advancing inclusion. We are fortunate to have four experienced and knowledgeable experts and practitioners in the digital field for this discussion. Two of them have been instrumental in building digital ID in their countries, representing a quite different country experiences of Estonia and India. Two individuals are from the U.S. government and civil society who've been at the forefront of building digital capabilities in U.S. assistance programs.

Time is short, and we want to get directly to the discussion. So I will forego elaborating on the topic. But I will note that just as COVID has moved to warp speed, the central role of digital capabilities, including digital ID and economic and social life and for government services, so the Russian invasion of Ukraine highlights its role in national security. I will introduce each panelist as I engage each on the first topic, and we will discuss the why and the how of trusted digital IDs.

Hannes Astok, a former member of the Estonian Parliament and noted expert on the information society, is executive director of the Estonian e-Governance Academy, which assists public sector and civil society organizations in low- and middle-income countries in traversing digital transformation. And I would note, is very actively

involved in helping the Ukrainian government and society today.

To set the stage, Hannes, let's focus on the experience in your country. Why was it so important for Estonia, following independence from Russia, to create a digital ID? Thirty years later, what have been the unexpected impacts of digital ID and e-government?

MR. ASTOK: Thank you very much, George, for the splendid introduction. Yes, Estonia started implementation of digital identity almost 30 years ago. And the reason behind it was that as Estonia was like escaping from collapsing Soviet Union in 1991, so actually we didn't have any proper data bases about our citizens, property, businesses, land, and anything else.

So we started to build it up from scratches, and we immediately decided that those data bases must be digital. But on the top of it we recognized that also after couple years of development, that the world is moving very much digital, citizens must have on the top of their traditional paper or plastic based documents, also digital identity, allowing them securely to use various government services.

So in 2002, exactly almost 20 years ago, our digital identity was launched for Estonian citizens, and it is compulsory for everyone. Actually that means that you are having it but you don't need to use it if you don't want. But currently almost 80 percent of the adult population already is using it.

And it has bring us to a situation that with government-provided and municipalities-provided digital administrative services are readily available, what means that almost 99 percent of the services are accessible in digital format, with couple of exceptions not related to a technology.

So we can say that first of all expected results are that services are available for the citizens online, what means that it doesn't mean is it nighttime or daytime when you use the services. It doesn't mean where you are located, you can be in India or U.S. or in Brazil, but you can still access Estonian government services. So it's also

reducing burden of physical offices and reducing burden to provide the services in paper manner.

Another expected result is that services are much more transparent and faster, so you don't need to wait until you are getting paper or certificates. And also the risk of corruption is much more lower because when it's machine to machine or people to machine communication there is no point where you can provide bribery even if you want to do. So as former President of Estonia Mr. Toomas Llves used to say, it's very hard to bribe a computer because it doesn't know whom to provide cash if you even wanted to.

But I think the unexpected results what we can learn now 20 years later is that the digital identity has changed the nature of the business also. So as Estonian digital identity is accessible for every business also so you can sign the documents with the same signature what you are using to communicate with the government. So the same digital identity, the same digital signature is understandable and accessible also for the businesses.

So every Estonian, when we are logging in to our online bank accounts, we are using digital signature. This is reducing burden from the banks, or we can sign any contract with any business partner in Estonia with a digital signature. What is reducing the risk of falsification of a document and speeding up remarkably the business process.

So I think the unexpected result and the fruits we are harvesting now is that business environment is much more transparent. Doing business is easier and fast, and this is like additional result of digital identity in Estonia.

Thank you very much.

MR. INGRAM: And did it take long for the Estonian people to adopt to a digital world and to accept their government online? Was it done instantaneously or was this a three- or five- or seven-year slog to introduce the populace to this new technology?

MR. ASTOK: No, what I think it was like, it's usually curve but initially were all like innovative are going first then the main bulk of people are coming, and then last part what still reluctant or not trusting still very much or not using still. So it takes like almost I

think 10 years to get there. But it was at the beginning of 2000, if it start in some country or some country start today when people are much more digitally savvy but also having gadgets like Smartphones in their hands, I think it will take much more faster. But that action definitely is not only about technology but also related to general trust towards the government, and this has been high during those years in Estonia what has been supporting the process very much.

Thank you.

MR. INGRAM: Thank you. Now over to Dr. Pramod Varma. You really need to know nothing more about Dr. Varma except that he is the chief architect of Aadhaar, which has provided over a billion citizens of India with a digital ID. He created the foundation for India's digital public infrastructure, often known as the India Stack. He has sense created other critical layers of digital infrastructure which we will learn more about today.

So, Pramod, how would you describe the motivations in India for an electronic ID? Were they similar or different from what Hannes has described? And how do you reflect on where India is after Aadhaar was introduced and the rapid digitalization that ensued?

DR. VARMA: Thank you, pleasure to be here. Thank you, George.

Yeah, this journal has been maybe slightly different. We are a developing nation, 1.35 billion plus, I think latest number 1.4 billion, we really don't know how many people we even have because there's a lot, a really lot. 120 actively spoken languages and used languages, 20 official languages, you know.

MR. INGRAM: Right.

DR. VARMA: You know, its diversity is tremendous. Among this diversity and, you know, mainly one common theme was the natural digitalization underlying the digitalization because the cellphone, not the smartphone, these smartphones, the cellphones were penetrating rapidly. People were starting to leverage it, and India is very

young, you all know, we are a very young country. So we are, most of the bulk of the people are very aspirational in India, who will adopt anything you've thrown at them, for why they see value in their daily life, economy growth, job opportunities, work and so on, or educational form.

So one of the biggest themes India was chasing, was there was I think it was 18 percent of population, roughly about 2.5 personal GDP at that time, 2009 when we started, was going into digital subsidies, into people. So government was like a BUBI, or like we were like giving so much money, it was amounting to I think 50, 60 billion U.S. dollars every year in fertilizer, power subsidies, food subsidies, scholarships, girl scholarships, permanent room and support, and so much money there was no clean way to figure out who was actually even getting them. Because most people didn't have bank accounts, most people didn't have identity. So the government was pouring this money and it's not, it was --

And one time, you know, in the late 80s and early 90s, people even thought less than 10 percent actually reaches the poor. And then but we obviously improved on it, but it was expected that roughly about 40, 50 percentage of this money, 50, 60 billion U.S. dollars, was going down the drain. And that was not acceptable.

So the one very clear mandate was clean up our direct benefit delivery. Benefit delivery must be streamlined so that millions of people and families can get their intended entitlement on time.

Second was financial inclusion. Financial inclusion was the Holy Grail that we were chasing. And pre-2009, the last-to-last year, Bureau of International Settlement, BIS, published a report that said we were less than 20 percent then in the country. And that tells you out of 900 million people, I guess only 20 percent had bank accounts. So that's terrible situation to be in.

So we had both financial inclusion, benefits delivery as the primary trial for our identity, and then that is one of the reasons. India was probably the only country that creates the identity development effort, not a national security effort. So we did not pass

that identity program under home ministry and subtle things like that, right? Most of the ID program goes into citizenship and home ministry and regard years and centuries of, you know, history, citizenship is a debate that will never end in India because of boundaries that are fluid and rigid, right?

So it is not for citizens, so we did an identity for residents, identity Aadhaar as an identity was if you're a resident in India, of course if you come there for six months and live there you can actually apply for Aadhaar and you can get one because you can open a bank account, you can do things like that. It's like social security in one sense. We all have it when we are working here, even our citizens.

So similar to that, and we also kept the identity program outside the national security home ministry purview completely into what are called a planning commission, then called a planning commission, now it's called NIFIV Org, which is a strategy development planning arm of the government. And now it's an independent authority under the law, identity authority.

So these subtle things actually benefitted the roll-out accessibility because we were always after to do what's called killer youth cases. If you don't have the youth cases, identity would have remained, you know, just another, you know, plastic card that people barely would know why it was given. They would take it, but no one used it. They would take anything government gives them free, they will take it, but it won't get used.

So we very much into the usage, we were very clear that benefits transfer has to be transformed. Now as you know, today I think 35 billion or 40 billion out of the 50/60 billion goes directly to the bank accounts of the people today. So we transformed, we run the largest direct cash transfer program. Which came in handy during COVID by the way. We could transfer 400 million people's money simply, all right. And that was powerful.

And then we also went from a sub percentage banking inclusion in 2010 to 85 percentage in flat six years, which no country would have done that that fast. And so these two were very visible socioeconomic value that we could give it to the people and help

the sustainably of our identity. Otherwise our identity would have drifted to its death I think.

George, I hope I answered, yeah. Are you muted? I can't hear you. You may be muted.

MR. INGRAM: There we go. I finally unmuted. So, Pramod, how many of those 1.1 or 1.2 billion, I see different numbers, Indians, actually utilize their digital ID? Are there government services that you have to have a digital ID to access? And what do I do if I'm not literate or I don't have access to a computer or a Smartphone and can't actually use the digital ID?

DR. VARMA: Yeah. Brilliant questions, by the way. It's one of those things actually differentiate probably like countries like Estonia. We are not uniform in any way, we are crazily diverse and we have 200 million people who, at best, who are Smartphone aware, really 100 million Indian speaking. But even if you stretch to 300 million, there are 300 million natives with computer, phone, and who are young, so they can try it out. And then we have at least 300/400 million who have no phone and no literacy background, literacy background, can't follow, do things on their own.

So the design of the identity had to be negatively digital so ID identity is negatively digital so it has no paper manifestation or a chip or a card meaning at all. But it can manifest itself as a printed paper for the people who don't have one, it can manifest itself using an old TP on a feature phone for the feature phone people, it can manifest itself as a Smartphone digitally assigned QR code on a Smartphone like, you know, Apple wallet, all right? We have the credential wallet for the Smartphone people. That's one angle of it. So there is manifestation identity, physical manifestation can really, dynamically, completely reverse, we don't care. So we didn't stick with the card. So we phone factor was relevant to us and we wanted to make sure any phone factor that fit the context is acceptable. Why is behind the scene everything digital?

Second was that it can be used in a self-service mode, people like us who can authenticate ourselves, enter the pin, password and all that thing. Or it can be used as

an assisted mode. And then there's a huge part of India still leverages assisted services. They go to an office to get their banking done, right. So they would okay, put your fingerprint here, okay, then it will read out loudly, you know, in the native language, oh, you have withdrawn so much money and whatever, right? These are all assisted services so we can do assisted service or paper through feature phone, the Smartphone, any phone factor, so that answers your last question.

The first question was the usage of it. So we have a huge 1.32 billion that have cellphone. Many of the other is permanent, it never gets revoked, it is permanent for you for times to come, that number never gets relocated or anything of that sort. We have 1 to 1.5 billion digital authentication every month. So that tells you that the usage is quite wide and we are what, 600 million to 700 million unique people out of the adult population. Children don't really do it because typically parents do it for them. Other population have at least used it once and at least used in once in a quarter also to connect that.

So that's really large. One of the things we look at is it a few people using it every day, or is it many people using it on and off. So the claim is that very large population uses it and they use it for pensions and they use it for financial money transfer and all that other services that identity team didn't build, it was built by the Bank of India, by the payment industry and by various government benefits industry. But they use their identity authentication services of the identity platform to build solutions, either assisted solutions or other solutions towards the people. So we are 1 billion every month, 1.1 billion authentication every month. So it's quite wide, quite in place, I think every month it gets used really heavy. I hope I covered that.

MR. INGRAM: Right. Thank you. So let's bring Kay and Chris into this conversation. Chris Burns has been leading digital development of USAID for a decade. He managed the joint Digital and Democracy teams. I would note that it was the digital and democracy experts at USAID that developed the notable USAID 2024 digital strategy. And he currently serves as Chief Digital Officer of the Agency.

Kay McGowan, as a diplomat and as a development expert, has helped support and build trusted and safe digital financial systems and data sharing systems. She now leads policy research and advocacy at the Digital Impact Alliance. And I have to confess, she helped me put together this panel and developed our line of inquiry. So thank you, Kay.

So Chris and Kate, first to you, Chris, and then Kate. What are the motivations you have seen driving digital IDs or unexpected consequences in markets where they exist?

MR. BURNS: Sure. And good afternoon and evening everyone. Thanks for the opportunity to participate in this conversation, George. It's certainly an important topic in today's digital age, and what an incredible opportunity for all of us to learn about Estonia's and India's leadership on this front.

If we're looking at digital identify infrastructure, USAID's engagement to date has primarily focused on the integration of digital identity in ways that support international development programming, which would make sense. So for example program monitoring, patient tracking through health services, voter registration and authentication, and the provision of humanitarian assistant. So I would say similar motivations to what Pramod was just outlining.

I would say also that digital IDs systems are now becoming foundational to service delivery and to development assistance as their pace of rollout continues to accelerate.

We see partners in countries both turning to digital ID systems in part where analog systems may sometimes struggle to uniquely distinguish individuals. For example many people may have the same name, or have their name recorded inconsistently across different situations. And so in those cases it might be difficult to verify their identity. In some cases individuals might not know their actual birth date, therefore relying on typical information used to verify identification in those analog systems may still resolve in

misidentifying them.

So having a digital identity, whether it be a unique number or a biometric, can in some context be a more efficient and transparent way to ensure that verification and to do so accurately. This can certainly be important, in some cases more than others. For example in healthcare in particular it's obviously really important to make sure that the right patient record is matched with the right person. And USAID has previously done some of that work in part through its Saving Lives at Birth Grand Challenge where we supported digital ID in a way to more reliably track new and expecting mothers through the healthcare system and to facilitate the delivery of prenatal care to them.

I would say motivation also exists with the high expectation of transparency and accountability in how we deliver our own programs. In doing so that transparency can actually spur further investment in the development and delivery and deployment of digital ID systems.

I suspect the theme of transparency will come up time and again in this conversation. And certainly it could be a motivation for many institutions, including donors, that want the ability to easily track who receives these services, where the resources are going, and how effectively the resources have been received.

We do note that this could lead to repeated investment in digital ID systems, sometimes in parallel to official identity systems. It's not that this redundancy is necessarily unexpected, but it does contribute to fragmented ID ecosystems where the individuals we engage with and for whom we serve might have to enroll in and then keep credentials for multiple official systems as well as ones that might be introduced at a program or activity level.

For the donors in government institutions that often fund digital ID systems, this of course can lead to an inefficient use of resources and possibly a greater burden for individuals and end users as they try to maintain access to those.

Certainly in some cases there might be good reasons for setting up

separate systems, particularly if there are privacy or security concerns about an existing system. And for example we carefully want to consider the realities that are specific to each context.

But ultimately I would note that donors are striving to align our digital investments so that they are more sustainable, more inclusive, and do so in a way that strengthens countries' overall digital ecosystems. Doing so requires us to responsibly integrate with or strengthen the national ID systems in order to drive that longer term success and sustainability.

MR. INGRAM: Thanks, Chris. And over to you, Kay.

MS. McGOWAN: Okay. Thanks. George, I just want to say thanks for the invitation, the opportunity, and I'm really happy that Brookings has got this sustained focus on this particular topic of democracy and technology.

And you've already told people that I helped you put the panel together, but I was just going to say that I really couldn't, I'd be hard pressed to find three people that have done more collectively and individual than Hannes, Pramod, and Chris to advance the field of how to make technology work for people and how to make sure that it does that without eroding democratic values in institutions.

So I guess in response to your question, what other motivations are we seeing. I mean I think really the clearest answer is we're seeing motivations by countries that have much more authoritarian systems to use IDs and use technology and digital footprints in behaviors of citizens to, you know, manipulate, suppress, repress them.

And that's why I think this conversation and having Estonia and India represented is so important because they have both taken very intentional design choices that look at not just the technology itself, but the technology, the policy framework, and what are the impacts on the marketplace going to be very holistically. And this kind of techno-legal approach is so critical to baking in a lot of the safeguards that we know are needed to prevent the misuse of data.

And, you know, I'd love also to hear Hannes talk a little bit about transparency because one of the most interesting features of the Estonian model and their digital stack is how much transparency citizens have and how their data is being used and accessed by the government.

And, you know, for Pramod, I think it would be so interesting, you talked about some of the unexpected benefits of Aadhaar, but you only started to scratch the surface. I mean it's far beyond now improving social service delivery, right? You guys have built all sorts of other layers into your digital public infrastructure that work together to empower people, make sure that the benefits of the growing data economy are both larger but also more broadly shared. And, you know, in both countries while being really, really laser focused on protecting privacy and making sure that, you know, online digital participation for citizens is strengthening the country rather than eroding political norms.

So I'll stop there.

MR. INGRAM: Well, Kay, you've done a nice job of introducing the next topic of trust. So thank you.

MS. McGOWAN: You're welcome.

MR. INGRAM: For much of history identity systems have been used to target and marginalize minority groups. It's quite a see change to think of IDs as a positive force for change and it's important to think through how to build trust in them. As I understand it, trust is really central and critical.

And I will note that in the U.S. the IRS was recently forced to stop a shift to requiring digital ID because of political protests driven by lack of trust.

So, Pramod, after you answer Kay's question of all of the other 200 things that Aadhaar does, talk to us about how India overcome or dealt with the issue of trust in government processing data on individuals and using digital ID, or have you? Have you overcome, have you effectively dealt with the trust issue?

DR. VARMA: Okay. This is a loaded question. So first of all, to be very,

very clear, and that was a very conscious choice, Aadhaar does not do 200 other things. Aadhaar does precisely two things, always have been only doing two things, even today those two things. That minimalism of identity layer being extremely minimal. It does really two things. It's your identity authenticate when I go to a place that I am Pramod, I can tell the bank that indeed my identity claim is right or wrong. That's all it does.

Aadhaar does nothing, nothing on top of it. And that's a contrition, a lot of people have it because they think in just really layers all connected to each other. In fact none of them are connected to another, but they are like legal blocks. They somehow when you bring them together their economic value, the individual's value, collective value, becomes very high because your payment now, you Aadhaar now, we lock confidentially, and when that comes together the value increases. Other than the identity authority if it keeps it from doing precisely two things, by law. And it captures four attributes. No other identity system in the world captures these four attributes.

Ten is the best in the Philippines, and others are like 50 attributes, right, because most of ID comes from the purpose of marginalization or security, you know, those kind of mental model. So the more data the better, you know, in that sense from a government side. Other identity for government events. So it was very important that was part of the trust-building axel.

Given that clarity one of the things we built essentially, and that was one of those things I think if Brookings first came out with model and looked it, should look at it because, you know, I think that the models are very new and may not as popular as others, and sometimes you get hung up with 2010 what we did, right?

What we are doing is in three layers, and this is very key, fundamentally every citizen or assignee has had the same effort as small companies who are participating in the economy. Because we are nano entrepreneurs, that big economy, one person company, five people companies, and there are millions of them in India, right? They are as good as individuals frankly speaking.

These two are at the center and the three things that we want to empower them with is ability for their identity, which we are solving, business identities and individual identity. Or there was an individual identity, we have business identities as well now for electronic business identity, that they can verify.

Secondary, assets. Can they take control over their data and their potential for data and credential as an empowerment concept? Not data, nor does the monitoring control constrict, as an empowerment constrict, India has went all out and that's what I think Kay was alluding too. That India is the one country there, we not only have GDP like law that's coming in as a data protection, we have an actual system that allows individuals to take control over all our financial data, all our health data, without having a central data stored. Extremely private decentralized, fully decentralized. That means I am the owner of my data, I am the reciprocal of the data, not even government can see my data. So it's very, very clearly constricted architecture and, you know, Kay has been particularly in part of that in today's discussion.

So that is the second layer. The layer where individuals have control over their assets, whether their digital assets, digitized assets, data and prudential, where in essence we can now walk into a bank and claim, digitally make a claim that I am a taxpayer, I am an SME, I earn 20,000 rupees or whatever, you know, $100, $200 every month, I pay bills on time, I have a small shop, all these claims are now instantly verifiable by the bank. Why is it important? The cost of trust dramatically comes down from the bank's perspective to say oh, that's good, I can verify what you are saying, and hence I can now offer microloans to you, otherwise I would have said nothing because the cost of leaving review is much more than the business value I'm going to get from the bank. So lending, all that thing is opening up first time because individuals have identity and assets.

The third layer is where the equity. You talked about equity before, right, economic equity. It comes from ability to participate in opportunities. So how do we open economic opportunities? That is final, big economy. Look, I'm a plumber, I am a printer.

Today they are taken over by this platform monopolies. The big platforms would say list yourself in my platform and my platform will give you business opportunities because that's Amazon, you know, they all repeat the same pattern, right, pattern of a platform model.

India is converting from a platform model to a decentralized mental market like Internet where every individual and small company can actually get, you know, sort of broadcast their offers which is on a decentralized network. That is where the real value is. So we are moving toward from an identity, which is essential, foundational, as Chris was saying, to asset ownership that is necessary to really ability to access economic opportunities in the market. Whether you're a small homestead, whether you're a small plumber, whether you are a small shop, whether you are whatever it is, without having an intermediate platform monopoly taking off 30 percentage of my commission, and it doesn't make any more sense. So in their working independent and we're actually going the only country in the world that is putting up a decent digital economy network actually in there.

Now this brings back to the last point I think you were asking, how did you build trust on the identity system. Identity system was because of the minimalism. I think of a few things we did really well. Keep it out of home ministry, the norm good on home ministry security, you know, control factor, there's an ID for events. So keep it as an independent authority, first point.

Second, extreme minimalism, that means four attributes, all we do is two things, legally imposed that they can't do anything more to the act that we've got in the bill and the bill restricted the party from doing anything else. That's all they do. But I think there is some mixed bag.

Have we solved the trust issue? Frankly, you ask the last question, is it really solved? No. I think it is an ongoing thing. The fact that there's a billion authentications tells you that people are leveraging it in their pension and government services, mostly government services, right? Private services have alternate IDs to use it.

Banking and government is really they are benefitted. But beyond that I

think there is a mixed bag. You know, you know how India works, like we love to hate the government and love to love the government. So we are in that sort of situation that we are the largest working machinery, 700 million people, 600 million people stand in line and vote, you know. And through all the democratic processes go through and they hate the same people who actually we vote because they don't do all the good stuff we expect them to do. So it's a mixed bag.

And the good thing is that our wide broad democracy, thankfully, is still intact, hopefully it will continue to be intact, allowed us to have a really powerful debate for privacy. And that privacy debate of around Aadhaar was essential for the country so the people, the civil society who argued against it, actually people like us, always embrace it. We say that's perfect. They agree that democracy like India is still not one-sided, right? It's a vibrant, society can go to the Supreme Court, can argue, can fight it out. And that the rest believe even further so identity became very perfect, a pure play identity and nothing more. And the data access was just mandatory uses for the rest of us.

By the way, George, your earlier question, what does it mandated? It's actually not mandatory, anything else other than government subsidies, and partially for taxes, still not preliminary for tax collection. Because we only have 5 percent as being taxed so tax collection is a big thing for us. Other than that, nothing else is mandatory. A few things we did I think okay.

MR. INGRAM: Thank you, Pramod. That's great. So, Hannes, from what I've read I understand that Kay's discussion of transparency has been important in your country. And Pramod talking about not having a central data base, I think that's another element.

What are the elements for you all that builds trust and, you know, have you been able to solve the trust issue, or is this still a trust deficit?

MR. ASTOK: Thank you very much. And I think Pramod mostly already explained also Estonia system. So India is like a thousand times bigger than Estonia but it

looks like there are a lot of similarities. Maybe not in population, but on approach at least.

So if you're thinking about trust, the digital identity itself is just a key. We need to consider it is just a key. Access key, very much trusted key, we've provided track so everyone, not everyone, but related parties can track access validity of specific dates and validity of identity, let's say.

But to build the trust, I think it's about principles. So first of all it should be agreed in society what kind of data it collects about you. And what is the reason why the data is collected. So this is kind of fundamental. If you collect too much information about religion or other approaches then it's dead end already, when someone cannot use it. And this is like Chinese model where we need to control everything and provide credentials for citizens being good and accepting this model. This is not our model. So first of all what you collect.

Secondly, it should be clear that ownership of the data belongs to the citizens or businesses who are providing this data to the government. The government is just handling it, okay, by the law the government may enforce citizens or businesses to provide the data because it's a necessity for the functioning of the government and the nation. But anyway, the data belongs either to a citizen or to a business. This is fundamental and government handles it.

So this means that based on this fundamental approach, I can also control what government is doing with my data, how it is handling it. And it's not only theoretical exercise, but yes I can do it, but actually I cannot exercise, I don't know what it is. I know, there are tools in Estonia, I can provide automated request and get immediate automated response about how government institutions are using my data. My home address, whatever my children and so on, and that should be explanation always based on what law, based on what relations they are using this data. So citizens are having efficient control over the data they are using. But definitely we must consider that not every citizen is that much tech savvy or privacy of data protection savvy that they will do it. So that should be

also enforcement in place.

So in Estonia also data protection agency is very strong. They are capable to enforcing the rules and regulations and they actually control how the institutions, both government ones but also private ones, let's say, like banks or private doctors, how they are handling your data. Is it kept secure, is it access restricted and so on and so on. So it's also enforced.

And there's definitely every transaction, every use of the data, every digital service, must be also based on the law so it's not only that I have good idea how to put together a data from various data bases and identify whatever I can do, no, I should be a clear regulation or legal base for every service. So this means it's very hard to abuse also the data.

So once again, digital identity is a key but allows only me to access my data, not anyone else. And also it provides a track record, how it was used, and then how it can be also later approved that I was the one that was using the data. And fundamental issue, ownership of the data must be in individual or business hands who is actually providing this data to the government to only handle it.

Thank you.

MR. INGRAM: Great. Thank you. So, Kay and Chris what advice would you have in terms of ensuring the right safeguards are in place as governments introduce digital ID and accelerate generalization? Kay?

MS. McGOWAN: Yeah, that's a great question. And I think you're alluding to a really key point that in some ways the technology itself is the easy part, right? What's harder is making sure that all the wrappers and the safeguards and the enforcement capabilities are present so that these very, very powerful identity systems are not used for any purpose other than which they were intended, right? And it's very interesting how India and Estonia have both taken somewhat different but also, you know, same spirit approach in both the design and the governance.

And I'll stop there. I guess my one piece of advice is that what democracies and open societies have to think about is beyond the technology and the technical capacity is really the data of governance, right? Who has a right to access data, for what purpose, how are those safeguards built into the different elements of the technology and the legal and regulatory frameworks around them. I think that's really my final bit of advice that data governance is just as important as the actual technology platform itself.

MR. INGRAM: Thanks, Kate. Chris.

MR. BURNS: Right, George. I would certainly agree with Kay on those key points. I also think it's worth over emphasizing and perhaps it's not even possible to over over-emphasize that trust is the key critical piece to successful digital identity system development and deployment. And I think, you know, if you look at the Kenya scenario when they first released, the government of Kanumba, their digital ID system in 2009, they had great registration numbers, in part because it was compulsory, but Kenyans initially pushed back because the system came before the necessary privacy protection laws were put into effect. So that sequencing actually I think jeopardizes the level of trust that is needed to make these systems flourish and make them successful.

Across all of our digital identity engagements we take seriously the responsibility of working to ensure identity systems are inclusive, that they are secure, privacy preserving, rights respecting, and where possible, that they strengthen the underlying ecosystem components to support those similar values.

And while we consider these appropriate safeguards, we also think about how the enrollment and use of the digital identity systems will affect the most vulnerable. If enrolling in a digital ID system is a requirement for an essential service and basic needs or for service delivery, people will not realistically be able to opt out of sharing their identity information. But, you know, while getting informed consent is certainly necessary and important, we also need to make sure that those systems put additional safeguards in place that go beyond consent. This includes the need to practice privacy-preserving approaches

such as building systems with privacy by design. Encouraging data minimization, which has already come up. And having a plan for when the low likelihood but high consequence events, like perhaps a sudden regime change, may occur and risk the misuse of that identity information. And for those who still have concerns we need to make sure that there are viable alternative methods to verify identity when it is required to access those essential services.

Just this week Research ICT Africa and the Center for Internet and Society, shared their research from African Digital Identity Systems. And the researchers made a number of recommendations to improve the inclusion of local and often excluded stakeholders in the design of those systems, as well as ways to improve implementation of them. Such as supporting gender sensitive policies and removing barriers to registration, and really understanding the cultural, political, and economic dynamics of those systems at a local community level.

As Kay previously mentioned, with digital authoritarianism on the rise, and with that greater digital repression and surveillance. I think it's fair to question the motivations of some governments behind the rollout of their digital ID systems and trying to figure out whether they are doing so for service provision or to track and trace. So the issue of trust I think again emerges here.

Finally, I would say that from our perspective we advocate for taking an ecosystem approach to digital identity systems, recognizing that they interact with and are shaped by many other aspects of the country context. And that's certainly front and center in USAID's digital strategy that you mentioned up front, George, and its accompanying digital ecosystem framework that illustrates digital systems existing in broader environments, to include everything from the infrastructure that supports it to geopolitical considerations and digital rights, and to opportunities to connect within the cost of digital economy.

So I think this means that we need to support attention to and investment in a number of things. Cybersecurity capacity, data protection policy, digital literacy, and finally

the role of civil society in shaping and designing those ID systems. In doing so I think we can ensure that we are hearing the voices of those that are likely to be possible targets of discrimination or unwanted attention. And frankly the voices of those to whom privacy may matter most.

Thanks.

MR. INGRAM: Thanks, Chris. So in addition to trust and transparency, privacy keeps coming up. And I wanted to go into some detail in privacy except we have five minutes left. So we've got one minute apiece. And, Hannes, you've mentioned privacy already.

I'm actually going to ask you to spend 10 seconds on that that you want to add to, but given the flag behind you and what Ukraine's on everybody's mind, 2 million refugees plus, actually almost 3 million outside of Ukraine now, can they carry their digital ID with them, or can they get one? Can a refugee get a digital ID?

MR. ASTOK: Yes, thank you very much. An important question in current days.

I think first of all Ukraine has developed digital identity already connected to a Smartphone. So as a next layer. So basically they already can activate it and carry it in the Smartphone. So this is very important also related what Pramod earlier said, that the plastic card is already out of date. So you need to read a lot of stuff around it so it's better to have it in Smartphone. And we have in Estonia already our version that we use also in Smartphone.

So they can still carry Ukrainian digital identity with them, but also it's important that now, let's say when they are coming to Estonia, there is like 50,000 refugees already arrived. So what we do, we provide them immediately Estonian identity number and also Estonian digital identity, so allowing them immediately to start being, first of all, being included to all Estonia systems because whatever you're doing in Estonia, either the government or private companies, you need to have ID number what identifies you. And it's

providing you access to all services and all doctors and schools and whatever, they all see you immediately after getting this number.

And also we are getting digital identity means that they can start to use also digital Estonia services in digital manner. So this is very important, but definitely the next question could be that if they are now in Estonia, can Estonia also access to their data. Let's say if they are visiting a doctor in Estonia, can Estonian doctor see his or her medical records of this Ukrainian in effigy also. Not to start from scratches, but rather provide their medical service as soon as possible and as accurately as possible.

But this is still not the case but hopefully it might be solved also, maybe not with this crisis but in further developments.

Thank you very much.

MR. INGRAM: Thanks, Hannes. And I know it's unfair to ask you to stick to one minute, but I am.

In India, you went ahead and developed a digital ID, as I understand it, before you got the privacy right. And how did that work, and what are the ramifications of it?

DR. VARMA: Yeah. I think a couple of things, right? We did do the project, and even got our law, got our act that defines identity and what they can do and what they cannot do and who can access the data and all that questions.

It came in literally five years into the project so not the preferred order I would presume. But I think the project was under parliament approved under the executive order went to, you know, budgetary, everything is parliamentary approved and so on. So there was a consensus and discussions about the project, to do the project. But that totally was not governed under the law until the other Identity Act came, identity law came. And then subsequently the privacy. So I think the privacy debate happened, you know, first because of the project was going too soon, and no privacy, so we went up and said we really need to debate about the privacy and that sort for data. So that's what it took.

Yeah, but, George, I really believe we should have had a privacy bill and we

should have had even an identity bill in that sense, earlier, but I suppose that's what happened in India. Frankly I don't think it really was a trust of that system because the need was so high that I was telling you, less than 20 percent did banking, the dividend out of the money of 50 billion going down the drain, you know, people were not receiving money. And so people wanted it to be installed. So I think that demand was really high, that allowed us to continue with the project.

But the Identity Bill was very essential and subsequently the privacy debate. In one sense optimistically maybe, other there is a reason why we even had that debate. Maybe if we didn't we would have sat on it even more. So we don't know. Okay.

And so one thing I want to leave on the table, and it goes back to Hannes' point, that the design of the privacy. This is one of the reasons why the other team designing took extreme measures to make sure four attribute is all we get and to make sure the authentication trail. There is no track and trade. We talk about track and trade. I think Chris was mentioning about that.

The system, identity system, cannot track anything because purpose was explicitly in our capture so the identity system is what is considered, it doesn't know why you're authenticating, it doesn't know whether you are in the bank or opening a bank account, or whether you are actually awaiting food subsidy. You don't, the identity system is unaware of this. We did not capture purpose, it did not capture location. And we made sure we can only capture extremely minimal things, as you said, I am from Alderma (phonetic), I put my biometrics and they say yes or no. We don't really want to know why you are asking. We did not want why, where, nothing was captured. And with the law we even had, authority had to delete all the authentication records within six months. So the new system has not idea really of what your history of usage. And so such restriction was designed in early because the law wasn't there. So I think it's already benefitted us, you know.

MR. INGRAM: Thank you, Pramod.

DR. VARMA: Yes.

MR. INGRAM: Well, Chris and Kay, the best I can do for our audience is to give them a teaser. That, Chris, I really wanted to get in with you the guardrails that are needed and the work that you're doing with other donors to create a charter, a digital charter.

And, Kay, I really wanted you to do the impossible and in one minute explain the role of digital public goods. Which if you could have done it, no one else has been able to, but if anybody can, you can. But, you know, maybe we have another panel on those issues.

My thanks to all four of you for a superb discussion. I think we're a little bit savvier now. Hannes and Pramod, if you've got time, I'm going to talk to Chris about some reverse foreign aid and see if you can come to America and introduce digital ID for us. Our job will be obviously to create the political trust. Not sure I'm going to take that on. But anyway, thank you so much for being with us.

And now we move to our next panel, and I hand off to my colleague Zia, who's a Visiting Fellow in the Global Economy and Development Program here at Brookings. Thanks everybody.

MR. QURESHI: Thank you, George, that was a very good discussion. So we now move to the next session. I'm Zia Qureshi, a Visiting Fellow in the Global Economy and Development Program at Brookings. And I have the pleasure of moderating this session.

The topic of this session is Technology, Inequality, and Public Policy. Which is the topic of one of the research work streams in Brookings Global Forum on Democracy and Technology Project under whose auspicious this symposium is being held.

Technological change, led by digital technologies and the now unfolding innovations in artificial intelligence, is a defining feature of our time. The new technologies are reshaping economies and societies. Advances in digital technologies hold great potential to boost economic prosperity. But they also pose challenges. As the new

technologies reshape markets and economies, the disruptions they entail can increase economic inequality and in turn ferment social discontent and political conflict.

Indeed inequality has risen in many countries, and the rising inequality has emerged as an important subject of political debate and as a major public policy concern. We face important questions, in what ways is technological change contributing to the current rise in inequality. How can the promise of the digital age be harnessed to promote more inclusive growth and development? And what are the implications for public policy?

We have with us today an excellent panel to address these questions from the perspective of both advanced economies and developing economies. We have Francois Bourguignon, he is Emeritus Professor of Economics at the Paris School of Economics. A noted scholar on the subject of inequality. And also a former Chief Economist of the World Bank.

We have Nora Lustig, she is Professor of Latin American Economics and Director of the Commitment to Equity Institute at Tulane University. And also a non-resident Senior Fellow here at Brookings.

And we have Deepak Mishra, he is the Director and Chief Executive of a prominent think tank in India, the Indian Council for Research on International Economic Relations, or ICRIER, as it is commonly known. Among other issues ICRIER is engaged currently in the search on various dimensions of digital transformation.

The Event Page at the Brookings Website provides links to the very impressive resumes of our esteemed panelists. So thank you, Francois, Nora, and Deepak, for joining us today. And especially as some of you are joining us later at your location. I would also like to thank all those who are tuning in to this discussion. And as a reminder, viewers can submit questions during the discussion via email at Events@Brookings.edu or via Twitter at hashtag TechforInclusiveGrowth.

So in this session we will proceed as follows: We will have two rounds of questions to the panelists where I will ask panelists to share their thoughts on first the links

between technological change and rising inequality. And second, how the public policy needs to respond.

Panelists are requested to keep their replies to four to five minutes per question. And that will allow us some time to then take up questions received from the viewers.

So let me start with Francois Bourguignon with the advanced economies. Inequality has risen in many advanced economies, particularly in the United States since the 1980s as the digital revolution increasingly transformed production processes and the nature of work. So is technological change an important contributor to the rising inequality in these economies? And in what way is our new technologies contributing to higher inequality.

In a paper, in a book recently published by Brookings entitled *Shifting Paradigms*, you say, Francois, that inequality could continue to rise as artificial intelligence leads a new wave of digitalization and automation, what you term an incoming technological tsunami. So how do you see the nexus between technological change and rising inequality? Francois.

MR. BOURGUIGNON: Thank you very much, Zia, and thank you very much for the invitation to this very interesting panel.

To answer your question first, I think you're right in saying that it is particularly in the U.S. that we see rising trend in inequality. And this in particular in the U.S. that there is this view that maybe this rising trend is going to be the evolution of digital change.

In other countries we don't see really a trend. We have seen the vastness of one of increase in inequality, but then for example the last 10, 20 years the inequality trend has been quite reasonable. And nevertheless there is no reason to believe that over the last 20 years technology could progress hasn't slowed down. If anything it would be exactly the opposite. So because of that I think that we should be careful in not associating systematically rising inequality at any moment and everywhere and technology culture.

Now as far as the relationship between technology culture and inequality is concerned, one form in this paper that you mentioned I was referring to -- a technological change basically because I was following what researchers are telling us. And there are competing, really, in their trying to find the highest proportion of jobs which would disappear, of jobs which would be replaced by machine, by artificial intelligence, and the usage has been created that require a huge skill by the people who would get there. So because of that we would expect the theory of inequality to work.

Now when we look at what happens in advanced countries over the last 20 to 30 years and technical change, automation, artificial intelligence have been going on for quite a while and at a rapid speed over time. The ending answer we find, which would link technological change and inequality is much more fragile.

There are studies which have tried to figure out what could have been the impact of robotization on employment, on inequality. They found that, yes, there was some impact on inequality but it was not that big. And they found that the impact of employment was not that big either. So the plan for digitalize that you would expect was not there.

When we look at the evolution of the equality of earnings in the advanced countries, again we see a big difference between the U.S. and other countries. In the U.S. without any doubt high skilled people got a salary increase which was much faster than in the rest of the population. And in other countries over the last maybe 15 years, 20 years, this is rather flat. Even a country like Germany where we know that Germans were really trying to attract as many Indians, specialists in computer science, meaning that there was scarcity of that kind of job of the kind of expert in the country. Even there there is an increase in the inequality of earning, but it is not that big.

So because of that it is a bit difficult to say that if digital change is so powerful in generating inequality change, then we should have seen already an impact in all countries. So the only explanation that we can give to that is the old Claudia Goldin story about the race between technology and education.

When we look at the evolution of the number of people going to college, getting out of universities, etcetera, we find that it is certainly the case that in Europe, in Japan, there has been an increase in the supply of educated, highly educated workers, much more than in the U.S.

So one possibility would be simply to say fine, there has been a technological change but the surprise side of the labor market provided exactly the kind of expertise that was needed by the demand side very much affected by digital technological change.

So this I think would be the kind of story that we could tell today. Say, okay, so if for one reason or another technology could change the rating, then inequality may be rising in those countries where until now it was more stable. And if education is for some reason going down, then again, we see inequality rising. So this is the race I believe is still a good story to explain what has been going on.

And let me add only one final thought. Which is the fact that we expect that if there is this big change throughout the nation to robots, to artificial intelligence, then we expect that the owners of the algorithm, the owners of the robots will see the share of the initial income going up. And therefore we should find that the share of capital income in GDP should be going up.

This is something that we observe in most countries, although the very long run, but there is some debate about what is behind that. Some people say that what is behind that is essentially the increase in real estate prices. So difficult already sector, but difficult to say. But certainly this is something that has to be watched very carefully because this might be one of the main reasons why inequality could go up if the tsunami as a matter of fact is coming.

MR. QURESHI: Yeah. Thank you, Francois. We will come back to some of the issues you raised.

So let's turn to developing economies. Deepak, while digital transformation

has been increasing inequality in some advanced economies, particularly as Francois just noted, in the United States, by polarizing job markets, widening earnings inequality, and also the increasing market dominance of large digitally advanced firms and digital platforms, will this transformation have similar impacts as it penetrates developing economies? And also, developing economies comparative advantage based on low skill, low wage labor make that increasingly eroded by advancing automation.

So the question is, will the new technologies produce rising inequality and diminish job prospects for these economies rapidly growing those skilled working age populations? Inequality in India has been rising, so how do you see the technology in inequality dynamics playing out in an economy such as India's? Deepak.

MR. MISHRA: Yeah. Thank you, Zia. Good afternoon, good evening, good night, depending on where you are. If I sound a bit groggy or sleepy or incoherent, you blame it on the time, it's midnight in Delhi. But I'm super excited to be part of this panel.

So before I start answering your question I just wanted to say something based on what Francois just said. You know, there are three views, potential views when it comes to technology and inequality. So kind of the Mark Anderson, who is the Netflix founder, he tweeted after he finished the article and published it, he says technology is not driving inequality, full stop. So that's the kind of the Silicon Valley where the, you know, don't even think about that technology is driving inequality. That's I think too optimistic view on this.

I think the more pessimistic other extreme is that technology is kind of one of the main factors driving inequality and we can't do anything about it.

I think there's a third view which is the kind of the middle thing, is that technology is certainly driving inequality to some extent. There are good evidence to believe in it. And it's not a bad thing because technology inherently unequal, they are productive biased, they are skilled biased, and they're power biased, so funds which are more productive then to use technology better. And so then the more powerful, you know,

individuals or governments entities can use it much better than the ones who are less powerful. But that's the whole reason why we have public policy to deal with those side effects of technology.

So in a sense I fall into the second camp of where I do believe that technology does lead to contributing to inequality and that's very much inherent in the way the whole technology and growth functions. And that's something that we don't need to fight it directly by saying let's not bring in those technologies, but try to fight it by using social and fiscal transfer that we have.

Now let me turn very quickly to the India discussion. So I think there is three parts to answer your question. One is what is going to happen to technology adoption and distribution of its adoption in India.

Second part is, you know, what has happened to inequality that you said has obviously increased.

And thirdly, you know, is technology driving those increase in inequality in India context.

So first is on terms of production and the distribution of this technology over the last few years. You know, India being a big country, lot of the numbers are huge, but it doesn't, you know, give you a perspective as to how massive this transformation is happening in Indian context.

So at this moment there are about 1.3 billion Indians who have digital IDs, you know, which is huge. Among, you know, there are 1.2 billion more bytes of cyber in India. There were 900 million Internet users. There were 600 million who are using Internet on a regular basis. And there were 500 million people who have bank accounts, and disproportionate of them had a bank account because they had a digital ID and a mobile phone, because all of the banks are now moving digitally.

And COVID has been accelerated to this adoption. So I'll give you an example. In 2017, only 20 percent of Indians were users of the Internet on a regular basis.

This number has become 50 percent by 2021. So almost, you know, two and a half times increase. But there's still half a billion population who are not regular users of Internet on a day-to-day basis.

We did a survey recently where we found that micro, small, and medium enterprises in India are actually increasingly adopting technologies. So in 2021 of the firms that we surveyed, 27 percent of the sale came through eCommerce. And the number in 2020 was 12 percent. So you can see how dramatically this number is changing over time.

And as we heard from the previous speaker about the sort of digital lag in the public digital platforms, from India that, you know, there's been an explosion of digital platforms, which started with the digital ID, which became the base on top of which there are now unified payment system. The whole COVID vaccination platform was built around it, which kind of made it very easy for Indians to actually vaccinate especially where you live and where you are.

So all those things are obviously super important in showing that the explosion has dramatically changed over time. But then what has happened to the distribution of those? So why the mean has increased? What we find also the distribution is widened. So there is lot more inequality in the way the access has happened. So the border Indian states have actually had a slow growth of Internet reduction than the richer Indian states. When it comes to, we had a survey that we did with 7,000 users, but we found that, you know, 89 percent of households who have the head of the household has a Tushar education. Of that, you know, of households with Tushar education, 90 percent have Internet access. Households with no education of the head of the household, has only 10 percent Internet access. So there's a least one difference in terms of the head of the education.

When it come to age, you know, 15 to 25 years, 71 percent of them use Internet, if you're over 55, 12 percent. So there is massive distribution gap in terms of education, age, and income inequality.

Thankfully the gender and geographical inequality is actually lower. It's still very significant but much less than income, age, and education. And the gender and rural urban gaps are actually shrinking over time. So there is some positive news on that.

But so while access is improved, the distribution has widened and then the question is what are people doing with this technology that they're having access to. And here we find that actually during COVID period even households which had access to technology were not using it, providing them more access to their children's education.

So in a sense despite access, even among the rich households, a lot of them are not effectively using it as well as it was done in many advanced economies. And that's something that I would let us come in later part of discussions are why have people, despite having better access, are not able to use it?

And then coming to the inequality. As you said, inequalities increase and the question what has technology to do with it? And frankly, the evidence at this point is not enough to take a very, you know, clear stand, a credible stand on this issue. But what you find is clearly because in India, at this point, even the lower adoption that was there so within its adoption because it's creating more growth, creating more jobs, there are not massive automation in India so this whole polarization and job displacement hasn't yet started in India, I think it's inevitable. And clearly there has been a significant improvement in service delivery. So a lot of positive story. But as I said, because distribution is widened and because the rich, you know, people with access to technology and at the top end, have seen massive increase in their wealth, which may not be linked to technology but because of all those other reasons, one should be using it in a liquid in a global market, you do see significant instances of inequality over the same period. So there is a strong association but I think reality still needs more research to be said in clear terms.

I'll stop here. Thank you.

MR. QURESHI: Thank you, Deepak, for some very interesting numbers. And I think India is a very interesting case to see how these technology and inequality

dynamics evolve as there is greater technological penetration in the economy going forward.

For the next question we stay with developing economies but move to a different region, Latin America, where Nora has a lot of expertise. So how technology impacts in inequality depends greatly on how its effects work through the labor market. Whether it leads to higher inequality is influenced greatly by how the supply of skills responds to the changing demand for skills, or what has been termed the race between technology and education as Francois referred to that.

In Latin America, unlike in other regions, or like many other countries, inequality in fact declined in several Latin American countries, albeit from high levels, in the 10-to-15-year period starting around 2000.

So, Nora, my question is, how do you explain that outcome? Did a public policy push to expand education, give education the upper hand in this race with technology? And briefly what are the trends in inequality in the region since that period of decline in inequality? Nora. Nora, you have to unmute yourself. Yeah, good, thanks.

MS. LUSTIG: Yes. Thank you, Zia, for inviting me to be in this distinguished panel. A thank you to Brookings. Yes. So I think that my intervention is going to connect very quickly with what Francois was saying. First of all because Latin America is a region that experienced a unique episode, historically actually, of persistent inequality decline for about a decade. That not only occurred in a few countries, apparently it occurred in every single country. Different degrees but every single country of the region experienced a decline in any of the measures of earnings inequality, in particular when you look at it, between around 2000. Some of them started earlier, some a little later. And sort of this trend stopped around 2012, 2013, I'm going to come back to this later.

So the question is, what was behind this. The period in which inequality declined in Latin America coincided with a commodity boom, and so many of the countries are more exporter people. First of all thought maybe it was related to growth, more fiscal space, higher demand for skill intensive, low skill intensive factors. And it also coincided

with a pervasive government of the left being in the executive in Latin America. At some point the country, so the 17 were governed by a leftist or leftist leaning government.

But it turns out that inequality declined both in commodity exporters and commodity importers, countries that were growing fast, countries that were not growing, and countries that were governed by the left and countries that were not governed by the left. So there has to be a different explanation.

And I think the explanation is going to go in the direction that Francois already hinted. From the research that we have done, by the way, one of the first books that looked into this was published by Brookings with my co-author, Luis Lopez-Calva, who edited a volume called *Decline in Inequality in Latin America*. I would put a decade of progress with a question mark because it was sort of like the beginning of the pattern, that we were not entirely sure whether what we saw was something that could actually say it's happening. It did happen.

And what we found is that the wage gap between people with higher levels of education and people with lower levels of education narrowed during this period. And this was the reverse of what had happened in the previous period where in the 90s inequality rose in many countries, and it was associated with an increasing wage gap.

But then, you know, the question is wages, relative wages, are determined by demand and supply forces. What we saw systematically is that there had been an expansion of education, primarily completing primary education and completing secondary education, was expanding significantly in the 90s. And this contrasted very sharply with what had happened in the 1980s. In the 1980s there was a lost decade, the debt crisis, educational upgrading was much slower and so the rising inequality in the 90s might have been linked to a process also that changed in the supplier of skills.

Accompanied also by a change maybe in a demand of skills. Some of the research has hinted, or as shown or suggested, that the demand for skills increased in the 1990s both because of change in technology and also because of the opening up of the

economies.

We think that then the explanation is primarily one in which the composition of the supply of labor changed, making people with higher skills, where skills are now measured in years of education, relatively more abundant. And that that resulted in the declining wage gap and that was the major driver of the decline in inequality.

So this is a very nice story because it means that through a public policy where governments can actually take action and obtain a win/win because educational expansion has many other benefits in addition to the decline in inequality, you could actually see a result in the right direction for the region.

However, this, and we anticipated this in the book, by the way. The access to primary and even secondary education is relatively easier for all the countries than access to tushery. So we anticipated that this sort of boost to expansion was probably come to us would peter out because the quality of education in Latin America is still pretty bad. And access to tushery education, even if it's not a problem of financing, for people that do not have the basic education of the necessary quality would not be an option. And I think also what we're seeing since 2012 and 2013, is a petering out of this process.

By the way we're starting a new project with the same co-author and others to look at the question 10 years later. Is it a reversal of this? We sort of start from this is probably that the race between education and technology after 2012, went the other way. And you do see not necessarily a sharp increase in countries, but you do see that inequality decline started to not happen, and in some countries inequality started to rise.

Of course you have the pandemic in between, and we'll talk about this later.

MR. QURESHI: We will come to that.

MS. LUSTIG: This brings in a sort of wild card in all this analysis, but it's connected with the idea of how the pandemic is affecting the race between education and technology, and how it's going to affect inequality in the future.

Let me stop here.

MR. QURESHI: Thank you. Thank you, Nora. I think this provides a good segue into our second round of questions, and we need to sort of pick up the pace a little bit. And I think in the next round maybe limit our replies to no more than three minutes each.

Now regarding the role of public policy, as I think all of you have said, that rising inequality is not an inevitable consequence of technological change. Much depends on how policies respond. So let me again start with Francois on that.

What policy adaptations are needed to produce a more inclusive outcome from digital transformation? Should tech and transfer policies do more? Should public policy steer technological change toward more inclusive labor friendly innovations? So if we look at sort of these three policy domains, let's call the first pre-distribution, the second redistribution, and third influencing the direction of technological change itself.

How do you briefly, broadly see the policy agenda in terms of these elements? Francois.

MR. BOURGUIGNON: Since we don't have very much time, let me be brief on this. I think that the first thing is we need following over to let's say said about the diagnosis of inequality and technology change indication. If this indeed be the policy area. Not only we need to train people better in terms of ID, AI technology, but we may also have to change the basic, the curriculum in primary school because when we are training or educating people for jobs which will not exist anymore. So we certainly have to think about the reorganization or the reorientation of our education systems. I would say that this is the priority.

Second, to correct increasing inequality through taxes and benefits, this is always possible. But not that we need some increase in inequality if we want to have incentives on the demand side of innovation for people to indeed go get the kind of training that they need to be competitive on the labor market. So to simply equalize blindly may not be the right strategy. But it is something, we have instruments like obviously taxation and like different types of benefits that should allow us to reduce an increase in inequality. And

because we are talking about how fast it was possible for advancements to use those reciprocal instruments. And if tomorrow there would be this tsunami I was referring to before, then it is certainly indicated that some kind of basic income, basic transfer system would be applied.

And the first policy that you mentioned, should we fear the technological core change. This was a suggestion made in a paper by a Cybil Blu and Eric Stripple (phonetic). It is also a suggestion made by the late Tony Atkinison. The point by Cybil Blu and Stripple was to say we should avoid the vertical change which is a pure substitution. If there is no increase in total productivity associated with this technology innovation, then it should not be. This is fine, I mean from a theory point of view, fantastic. Now how do you do that? And how does the development can guess what would be the impact of some kind of technology innovation.

So I'm not sure that we can go very, very far in that direction. And to some extent I would prefer the kind of suggestion that Atkinson was making in his book on inequality, what to do. One of his recommendations was to make sure that all public services people would be able to access a human voice rather than to access a recording and not official or synthetic voice. And by saying that he was basically showing that it would be a kind of voluntary policy to have something which would be labor intensive in some part of economy makeup for activity and at the same time these would probably change social relationships.

I think that I would prefer to go in that kind of direction if necessary than to the direction of the trying to control the technology change which seems to be a bit problematic.

MR. QURESHI: Yeah. Thank you, Francois, this makes sense. Deepak, a few years ago you lead a report at the World Bank that highlighted the promise of the digital revolution. It spoke of digital dividends, you brought up benefits of digital technologies for growth, jobs, and service.

So using India as an example, briefly, what policies is India implementing to realize these dividends and what more needs to be done? Deepak.

MR. MISHRA: Thank you, Zia. I think I'll take much less time than I took a little longer in the first question. So very quickly I think when we wrote the model in 2014/15, that was a 2016 period after 2015, I think we were a lot optimistic on India. When I go back and read it then what I see now and I think the big thing that we missed out, we did talk a lot about the digital ID and the benefits. But what we didn't see was the cascading effect and the positive sense that this platform will bring at least. We saw this Tunisia example and we had used this Tunisia to kind of extrapolate how this is going to play out. Actually I think Indians have done even better in terms of using the digital ideas and platforms for many of the services. Partly because of a risk which is that Indians are lot less concerned about privacy and security at this point, which might be a huge challenge and a stumbling block going forward.

So I think in terms of challenges, what Indians should end up doing, I think first is I think Internet is still inaccessible and unaffordable to very large part of Indian population so there's a massive agenda of connectivity that India needs to do. And a lot of the government programs are not working very well for the rural of India and they really need to think about it.

I think the point on skills and education is immense value even if it is a net exporter of human capital to the rest of the world. I think there's a massive number of Indians who are still not used to basic literacy, digital literacy, and there's a need for that and for the future generation that are coming into the labor market in 10, 20 years. I think that part has not dealt with. There's an education crisis, learning crisis in India. So I think that's the second point.

The third is the one that I mentioned. I think there is the privacy legislations are weak, the avenues is much weaker, and the systems are very fragile for cybers, you know, attack. So all those things need some much more investment.

And the final point is there is a sense of, you know, nationalism and local additional of the data like many other countries, in China and all those, Indonesia and Pride. The Indian government would prefer that a lot of the India sensitivity dubbed the cities and stayed in the country. India is a tropical climate where building lots is expensive, but if you do that this is going to disturb a lot of the business model and the fact that India actually uses the rest of the world data to do business such as outsourcing would also be on the agenda.

So I think to me the skills, the excess affordability, privacy and nationalism are kind of the four big challenges that the India economy faces. And this is as India wants to have a 20 percent of the GDP coming from the digital economy in the next five years, which is the government target. Thank you.

MR. QURESHI: Very interesting. Well clearly the role of education and training is important. It has been stressed by all of you. And Nora, you in particular in the context of Latin America.

Your recent research expresses some concern that the COVID 19 pandemic may compound the challenges in the region in preparing workers for the work of the future because the pandemic may increase education gaps. So what's the agenda there, how to prevent such lasting scars from the pandemic? And we have a couple minutes. Nora.

MS. LUSTIG: Yes. So now casting exercises that we've been doing shows that for children that come from low parental socioeconomic background, the pandemic could put heightened competition rates similarly to what they used to be for children born in the 1960s. Okay. So huge retrogression.

We're doing the same thing for Africa by the way, same analysis, and we are finding similar results. So it's not a situation that effects Latin America. What this means is that probably in the future the composition of the labor force would move in the wrong direction from what I said earlier.

So what governments could do I think, let me just be very quick since we don't have time. There's I think three areas in which action has to be mindful about what may happen in the future.

First of all I think that it's sort of the aggregate fiscal policy now that governments might have to reign in the fiscal deficits that were increased during the pandemic. It's very important not to cut education spending in particular, protect areas that are important to proceed with the process of inclusive growth have to be protected from the fiscal consolidation that's inevitably going to come.

The second thing has to do with how to use technology to make sure that education is inclusive, and I think we're not through with the pandemic, unfortunately. And also we've learned that there are other reasons why people may have to use remote learning. So all the digitization that we've learned in the past two years and also the things that we learned that do not work, should be put to use in order to make it much more pervasive, the access to digital technology.

But thirdly, the main reason why we find that children that come from families with low socioeconomic background do much worse than the others, is because they don't have the mentoring and the ability to be sort of coached when they do home schooling, regardless of whether they have access to technology or not. So the remedial actions will have to be very focused on first of all rescuing those that have already dropped out, to try to bring them back in. And second, to those who are in risk of dropping out of school in order to avoid this becoming a massive lasting scar in the future.

That type of initiative is very, if untargeted, you know, it's not something that can only be done at a distance, it's probably not something that the governments by themselves are going to be able to do, it will require contributions from both the private sector and civil society as well.

Let me stop here.

MR. QURESHI: Thank you. Thank you, Nora. We are unfortunately out of

time, it's a big topic to address in the 45 minutes that we had.

We don't have time left for taking up any of the questions that we received, but in your remarks you have already touched on several of the themes in those questions.

So we live in a time of exciting technological innovations with immense potential and possibilities, but as we just heard, there are also major challenges to manage this change to build inclusive prosperity.

So we thank our panelists for their thoughtful observations, it was a stimulating discussion. And also I would like to thank those who joined us online and for the comments that they sent.

So we need to wrap up the session now so we move to the next session. And I would hand over to Priya Vora, a colleague at Brookings, who will moderate the next session.

Thank you, Francois, Nora, Deepak, and thank you all to those who joined us.

MS. VORA: Hello and good afternoon to everybody. My name is Priya Vora. I am a nonresident fellow here at Brookings and I'm the managing director of the Digital Impact Alliance. I have the pleasure today to moderate a discussion with Isobel Coleman who I believe is joining us shortly so if everyone can hold tight as we make sure she's on the on the line. Thank you.

Thanks for your patience, everyone. Just hold tight. I hear we are -- we will be joined momentarily by Deputy Administrator Isobel Coleman so thanks for your patience.

MR. INGRAM: Priya, while we're waiting for Administrator Coleman to come on, why don't we continue the conversation that we had in our panel and maybe you talk a little bit about what the role of digital public goods is in promoting digital development?

MS. VORA: Yeah. Well, thanks, George. And I think what Estonia and India have done is paved the way and demonstrated an incredible scale of what's possible in terms of having national payments infrastructure and national identity infrastructure.

And so, the movement of digital public goods is basically suggesting let's not reinvent the wheel. Let's try to use solutions that exist. Try to make sure that they are open source or open standards so that other countries especially those who may not have the great engineering talent that India does, for example. So that they can kind of leapfrog and use some of those same tools, modify them obviously for their context and hopefully save a lot of time and resources in doing so.

It sounds easier said than done, but that's the great promise.

MR. INGRAM: So one of the issues that came up that we didn't have time to pursue, and it is not intuitive, is why not have a central database with everybody's data and information in one database. It's easy to access and you've got it all in one place?

MS. VORA: Well, the biggest issue is, you know, you want to make sure then -- well, how do I do this? You don't want to have too many kind of pipes going into one system. So you might have my information in, obviously, a database. But what you don't want also closely linked is, you know, my healthcare details, my financial details, my movements. You know, all sorts of things about me.

So, you know, in both the cases of Estonian, India there have been concerns about breaches and security. And the more information that's centralized and available at one point about me makes it more concerning if there is some sort of breach. And of course, data security is a complex issue. And we have to prepare for a situation where databases will be hacked into. So not having as much centralized.

MR. INGRAM: So your data -- discrete aspects of your data might be spread over five or six different databases?

MS. VORA: Right. Exactly. And, you know, the complexity there has been you want to make sure that not just your I.D. databases is very secure, but everything that then links to it. So there is a real need in all of this to be mindful of cyber security and not just kind of the policy regulatory environment that the very hard scales of keeping those databases secure.

MR. INGRAM: So it sounds like a national -- a government digital system is quite complex. And, you know, my observation is that national systems tend to be built in pieces over a period of time without a comprehensive plan or strategy. Is it important to have a -- to start out with a comprehensive plan and then build the pieces logically so that they all fit together? Or is that too much of a dream?

MS. VORA: Yeah. I kind of think that might be, you know, wishful thinking. You know, in my mind the need is to have a very specific use case because you're not trying to design technology and then just hope it's useful. You know, you don't want to have a use case in mind.

But as you're designing the technology, you want to do so in a way that's mindful of other use cases so. And that the technology is built for reusability and repurpose. And so, you know, there's the term of eloquent code. You want to really make sure that the code is eloquent. The design is eloquent even though you might be squarely focused on a particular use case.

MR. INGRAM: And the word eloquent really means simple?

MS. VORA: Yeah, yeah. It can kind of endure many use cases, right.

Okay. It looks like we have -- thank you for filling the time, George. It's been very awkward for everyone to just stare at me.

MR. INGRAM: Well, you did well. Thank you.

MS. VORA: And ironic to be having technical issues as we're talking about technology, but so it is, right?

MR. INGRAM: That's why we need to get Hannas (phonetic) to promote here to help build our technical system for us.

MS. VORA: Well, thank you so much, George, for keeping me company.

MR. INGRAM: Okay. I'll look forward to your conversation --

MS. VORA: Yeah, likewise.

MR. INGRAM: -- with Administrator Coleman.

MS. VORA: Okay. Well, thank you to everybody in the audience who's waited with us patiently here. I hope we have Deputy Administrator Coleman on the line. I see your name but not a face as yet. If you can hear me, it would be great to make sure that your video is on and your off mute.

MS. COLEMAN: All right. Can you hear me?

MS. VORA: Yes, I can hear you.

MS. COLEMAN: Okay. I'm so sorry. I'm dialing in. We're having digital problems here.

MS. VORA: The irony of it all.

MS. COLEMAN: The irony. I really, really apologize.

MS. VORA: Well, that's okay. We're just delighted to have you here. And if, it's okay I'll just jump right in even though we don't have your video live. Is that okay?

MS. COLEMAN: Yes, I'm sorry. Yep. I'm on the phone. For some reason, I could not get through on the Zoom link and I apologize.

MS. VORA: Well, that's okay. That's okay. We'll do it the old fashion way. So my name is Priya Vora. I'm a nonresident fellow here at Brookings and I'm managing director of Digital Impact Alliance at the United Nations Foundation.

I'm so pleased to have you here today and to spend the next -- well, let's say, 40 minutes or so. Because you are just one of the most important leaders in foreign policy and foreign assistance. As deputy administrator, you're helping lead the largest bilateral agency in the world and you're overseeing the agency's work to strengthen healthcare systems, combat climate change, counter authoritarian influences and promote democratic values just to name a few of your small tasks. So it is really, really a pleasure to have you here today.

MS. COLEMAN: It's a pleasure to be here and again I'm so sorry about our technical challenges.

MS. VORA: No, that's quite okay. Before we get started, I just wanted to

take a moment and say thank you to you and your team for all the work that you do every day.

I worked at the agency for eight years during the Obama administration and I know how U.S. aid and especially our implementing partners serve as frontline workers in some of the most difficult parts of the world. And of course, sadly there are many of those right now. So our hearts and thoughts go out to all of you.

MS. COLEMAN: Thank you. Thank you.

MS. VORA: So, deputy administrator, we are here really to talk about technology and digital tools. They're in the spotlight now more than ever because of the great promise they hold in accelerating progress against the SDGs. And of course, during the time of COVID, we all have to rely on digital tools to stay healthy and productive while we stay remote.

But of course, we're also seeing great misuses and abuses of digital technologies. And I won't review those here since there have been a couple of panels proceeding us where we've talked about this. And just want to say we have a lot to cover.

But I want to start by acknowledging the role you played prior to joining USAID. You were CLO of GiveDirectly which is of course an organization that channels assistance directly into the hands of people who need it most. GiveDirectly has prompted a spirited debate about how foreign assistance is most effectively rendered and at a minimum it's shown how the development community really needs to broaden its toolkit. And GiveDirectly is, of course, also limited by the availability and of payments and identities solutions worldwide which are critical to making these kinds of seamless transactions.

So I thought as a first step, you could just reflect on your time at GiveDirectly. What you learned there about payments and identity solutions and how you're bringing those observations into USAID?

MS. COLEMAN: Sure. Well, thank you. And again, my sincere apologizes for being late and for not being with you through Zoom, but just on my phone. And thank

you for your kind words.

You know, right now it seems to be full Ukraine all the time, but when I came into this role, I was really determined not to let the urgent crowd out be important. And right now, of course, there are many urgent crises that we're facing.

But digital is really among the important. It is so important that we have a robust, comprehensive digital strategy that we can implement here at USAID to strengthen open, inclusive and secure digital ecosystems in the countries we partner with as you'll see in the digital strategy that we launched just about a year ago.

And just to put that out as our starting point. To answer your question, you know, it's interesting reflecting back on my time GiveDirectly. Of course, GiveDirectly is unconditional cash transfers. But I also think of it as a tech company, as a financial inclusion effort. So much of the work we did is with the very, very poorest who live really off the grid.

They have no identity, let alone a digital identity. One of the first steps we would take is to give people a means of accepting an electronic cash transfer. A phone that would cost, you know, a SMS, based system. It would cost us somewhere between $6 and $9 and it would come out of their cast transfer. And some people had a phone and would choose not to take it, but most people even if they had a phone wanted another one at that good price because we would buy it wholesale. And I guess one of the key lessons learned for me is, first of all, how quickly people learn to use a phone like that and to -- even if they're not illiterate or numerate to quickly figure out what buttons they need to push to access a cash transfer.

And then how creative and self-direct and self-reliant people are in figuring out how to connect an electronic cash transfer to the real economy. You know, to walk some distance to be able to cash it out at a kiosk. And how quickly the infrastructure would emerge to enable that. You know, we did a program in Liberia. GiveDirectly did a program in Liberia that people said was impossible to do because it was rural and remote and how would people be able to cash out their cash transfer? And yet, you know, they did. They

figure it out. And before you knew it, word would get around and pop-up kiosks would emerge and people would be able to cash out and use the money for whatever they deemed important.

So that's a long way of answering your question. I think people are innovative. They are self-directed. They are resilient and they figure it out pretty quickly. If you put the tools and the means in their hands. So maybe I'll just pause there.

MS. VORA: Yeah. Well, and now that you are at USAID, what do you hope the role will be in promoting payments and I.D. systems worldwide?

MS. COLEMAN: Yeah. Well, certainly for many years, USAID has been one of the leaders and drivers of advocating for safe and inclusive policies and regulations in partner countries to enable a robust digital environment.

As a founding member of the Better Than Cash Alliance. You know, we've worked for many years with governments and the private sector and international organizations to support the transition from cash to digital payments here at USAID as a way, of course, of achieving sustainable development goals. I mean it cuts across so many of them. If you can put efficiently, you know, connect people into financial systems and payment systems.

And that's included working with ministries of finance, banking authorities to make sure the right policies are in place and reaching the underserved in a responsible way. So USAID has been a leader in that for many years.

With, you know, my role here. I would love to see us accelerate those trends and continue to foster demand for services by enhancing digital literacy skills and making sure that more and more countries have safe and affordable payment systems in place that people can access. So particularly in remote and underserved areas. So that is certainly one of my driving goals here. I've just seen the power of that upfront, up close. And, you know, certainly, Priya, from your time here. You're well familiar with our Better Than Cash Alliance work that we've driven and the type of work that we've done in this

space.

So driving it forward, but also in a more, as I mentioned, with our digital strategy in a more comprehensive way. And really focused on digital identity too. Making sure that people have the ability to -- in all the different ways we're touching people. Whether it's through health programs or other that that digital identity that is created is portable and has a broader application than just a narrow one.

MS. VORA: Yeah, yeah. Well, thank you. Yeah, I mean that was certainly one of my big findings being at USAID that, you know, while we may not be driving the supply side as much, there's a huge opportunity to aggregate demand, demand for payments services or for rural activity solutions. So it was actually a very interesting kind of pivot in that sense.

And I want to talk about your vast experience in the world of building and serving democracy. Nine years ago, you wrote the words democracy is struggling. Every year since you read those words, global internet freedom has declined year over year. And when the public sphere of the internet is under attack, democracy as a whole is under attack.

So I wonder what you believe democracies of the world should do to ensure digital tools, digital economy. Really uphold the original vision where the internet is broadening access to information and opportunity and giving voice to the voiceless. And not undermining liberal, democratic values?

MS. COLEMAN: Well, that is an absolutely critical question. I think the first step is for democracy to acknowledge that even though technology is being used to promote empowerment, equality, inclusive growth, all of these good things.

It's also being used to abuse human rights, promote gender-based violence. You know, the unlawful surveillance and repression of populations. I think it goes beyond what we -- certainly what I imagined a decade ago. You know, you see it not only in the really, really bad countries, but you're seeing it in countries that we didn't even think of as so

bad before. Just the opportunity to facilitate corruption and undermine the rule of law in so many ways.

So I think what we're seeing is the use of technology as a driver of global democratic decline today. Even as it is also a source of democratic renewal and resilience. So it's such a double edged sword. Recognizing that social media platforms and other digital technologies have really given rise to new forms of misuse. And I think starting at that point is really important.

And then, you know, taking steps to counter that. You know, you've seen, I think, civil society certainly and, you know, the U.N. system, the G7 others waking up to the threat and trying to address the challenge through a variety of different mechanisms. You know, the Biden administration has made this a priority pledging to, you know, combat online harassment and abuse both here in the United States and globally. And, you know, looking at other ways to support the digital safe practices as part of our whole democracy renewal efforts.

So there is the global partnership that is demark led that we are very supportive of too to try to galvanize the multilateral system. Specifically, responding to gender-based violence. But the whole advancing digital democracy work that was part of our summit for democracy, I think is another big step forward in this for us. You know, to really try to tackle this critical issue.

An administrative power last year announced at the summit that we're planning to provide up to $20 million a year in this effort. But it's complicated. It requires really a whole of society approach that is going to be, you know, I think a relatively heavy lift in some ways to get governments to strengthen their legal and regulatory frameworks for technology and data to align with international human rights norms, to increase investments in technologies that are bolstering human rights, rights respecting technologies. Embedding human rights and democratic values into tech development design and deployment and really getting civil society and the general public to hold governments and companies

accountable. I mean it's really a multipronged effort.

MS. VORA: Yeah. No, it's absolutely no easy task. And because as you describe the very same tools that be used for good can also be used for bad.

I wonder given the fact that USAID operates in such a vast array of countries and sometimes conflict and post-conflict and stable environments are you thinking about how to kind of nuance your digital strategy or provide guidance for how to invest in digital development and the kind of different environments?

MS. COLEMAN: Yeah. I think absolutely. And we see a huge range of different environments as you've noted. And part of what we're doing is with our digital strategy is starting out by doing almost like a digital audit in the places that we work and figuring out what are the most important touch points and ways that we can be most engaged and most helpful.

You know, first of all, just defining a digital ecosystem as the systems, an enabling environment and the stakeholders that make is possible for people and communities to use digital technology to access services and interact with each other, pursue economic opportunities. But needing to like really dive below that, to have, you know, a better sense, a country assessment. And we're doing this digital ecosystem, country assessment or DECA.

We've done a number of them already in Kenya, Columbia, Napoli, Serbia, Pakistan, other places. And we've got a whole bunch more planned. That really helps us figure out where we can be most constructive and focus our resources to help partner countries really address their greatest needs. Some of it might be defense in cyber. Some of it might be strengthening independent media or around innovation. So there are lots of different directions that this can go in.

So there's no one size cookie cutter, you know, fits all by any means because as you noted at the top, these environments are really, really different.

MS. VORA: Yeah. Well, I mean I'm so glad you mentioned the digitally

DECA system assessments. I mean we just published a paper a couple of weeks ago. It's on the Brookings' website about how insufficient the indicators are around digital development. There's a lot of emphasis on, you know, does someone have access to a, you know, digital financial services?

But no sense as to whether or not those systems are designed with the user in mind to uphold trust and whether or not people are having good customer experiences with those systems. So there's a lot to do and to invest in so that we gain a deeper understanding and can do more of a kind of benchmarking around the way in which technology is progressing for good or for bad.

MS. COLEMAN: Yeah. And I mean this is a really important point. I think too often we have quantitative metrics and we really have to have qualitative metrics too. You know, it's not enough just to say, oh, people are able to access this or that, but it's what is the user experience?

MS. VORA: Right, right. And I would say both are insufficient, the quantitative are not fully filled in either. So it's an area for much deeper investment, I would say on global organizations like yours.

So we're talking here about the complexity of all these issues. And there's no clear answers or no kind of prescription we can copy and paste here. And no country in the world has figured out how to promote innovative ecosystems that rely on data while also upholding data privacy. Nobody has really figured out how to promote free flow of content while also curving misinformation, disinformation.

We struggle with these questions here in the U.S. Every country around the world is struggling with this. So how hard is it for you to make the case either inside the Ronald Reagan building with your colleagues or on the Hill or in your inner agency to make the case to invest deeply in digital development when the answers are so unclear?

MS. COLEMAN: Well, I think as we have been discussing. People certainly fear in the Ronald Reagan building, but also on the Hill. They understand that the stakes

are really high. You know, we ignore this space at our peril. Our strategic advisories are investing heavily in their own versions of digital ecosystems.

And therefore, I think that making sure that we are focused on governance because governance matters so much in trying to set rules of the road that the democratic world collectively can get behind in terms of international standards and cross border dataflows. How digital public goods are developed and deployed. Just to name a few.

You know, this was items that, you know, we make sure that G7 is looking at this year. To really help reflect and solidify our democratic values within this ecosystem that we're talking about.

Now, how you do it, of course, it is complicated because, you know, one person's disinformation is another's freedom of speech. And it does. It becomes quite complicated, but I don't think there's any lack of interest in this topic to make, you know. And I think people have a good sense of how high the stakes are. And I think that our private sector companies have also become much more attuned to the issues that are at play. Not to say that there's consensus around how to deal with them. But really how connected so many of these issues are with respect to the digital ecosystem. How it's being used for liberal or illiberal purposes.

So, you know, this is -- I think at a minimum what USAID can do is be trying to build -- invest in some of those, you know, rules of the road, but also be building some resiliency in the partner countries that we work in supporting civil society and academia efforts to identify, monitor how the digital ecosystem is being used in good ways and in bad. So that's part of the answer.

MS. VORA: Yeah. And probably just, you know, kind of creating the mechanism for joint problem solving and peer exchange just because these are thorny and vast of all the issues. We're seeing certainly a lot of demand just to connect with peers.

MS. VORA: Yeah, absolutely. And, you know, another thing I would say is that investing in digital skills in these countries, you know, puts more tools in their hands to

figure out how, you know, they can navigate the digital technologies fully and safely. But really focusing on digital literacy, which is a big emphasis. And focusing on marginal groups. You know, people with disabilities, marginalized communities, indigenous people.

You know, to really make sure that they're connected and that they're part of this discussion. And that they're not getting further left behind. So that's another big push for us.

MS. VORA: Right, right. So a woman who held your job not too long ago, Bonnie Glick, reminds us often that USAID is 96 percent earmarked. I mean USAID is 96 percent earmarked to sector issues such as health and education and agriculture.

How does USAID structural address this issue and match the rhetoric that's coming out of the White House that says these issues are so important?

MS. COLEMAN: You're hitting all the hard questions here.

MS. VORA: I'm sorry.

MS. COLEMAN: No, no. Not at all. I remember going through my confirmation hearing prep. I was like wait. Ninety-six percent? What am I doing here? No, I'm joking.

But look, we didn't earmark. Yes, you're absolutely right. There are sector earmarks. There are country earmarks. But within that there's certainly lots of opportunity to bring different elements of our digital strategy to bear. Just, you know, you mentioned health. I mean within the health world, we're doing so much in terms of a digital strategy, digital identity. You know, that our entry point is in the health sphere, but making sure that as we help people access, you know, emerging health systems in developing countries that they are being built in such a way. And that digital identity is being built that it can be, you know, executed and used in a broader fashion for more of the digital ecosystem in the partner country, for example.

So I think that there are lots of opportunities even within earmarked to do some very innovative work that really moves the ball forward.

MS. VORA: Well, I know that it is possible to maneuver within the earmarks, but I for one certainly hope that there become more concrete plans in Congress to modernize for an assistance to meet the digital age.

I certainly found, you know, and felt firsthand how difficult it was to build up the skill set within the agency of people who really, really understood these complex issues. And then can influence and support all the countries and the earmarked programs. It became a very difficult task and I hope people on the Hills are listening for the need to modernize and address this issue because it's very hard to take a cross cutting issue like digital and try to fit into these earmarks.

MS. COLEMAN: Yeah. No, I recognize that challenge too. And I would say that, you know, we're seeing some movement. But you've touched upon a really important topic which is making sure we have the skills within USAID to be very conversant and cutting edge on these topics.

And, you know, we have to look internally too and make sure that we've got the right skills internally to be doing the cyber work that we want to be doing. The e-governments work we want to be doing. The countering disinformation and misinformation and understanding AI in international development. And having the skills and capacity here to invest in and really build out digital public goods.

I mean that's ultimately it has to be not, you know, siloed but spread out across so much of the work we do because so much of it is changing rapidly in response to opportunities that are now emerging because of the advances that have been made in digital. I mean, frankly, the work that GiveDirectly does could not have been done 15 years ago, you know.

Today, you know, it's enabling a new type of work, a new type of model and making sure that we at USAID are fully, you know, cognizant of those advances and driving them too.

MS. VORA: Yeah, absolutely. I would be remiss if I didn't take a moment to

acknowledge what an amazing digital team you have at the agency. Not only do you have some great engineers, but IO emphasis and planetary physicists and just an incredible group who are bring systems thinking to these questions.

And of course, working hand and glove with the democracy team to make sure that the governance around digital tools are governed in a way that promote democratic norms. So I really want to commend that team and commend you for keeping this issue on the radar. It would literally have been unheard of for the deputy administrator to spend 40 minutes talking about digital technology in my day at USAID. So it's wonderful to have you here.

MS. COLEMAN: No. As I said, it is such an important issue. It is critical to so many things that we're doing. And thank you for your shout out on the team. They are an amazing team doing so much amazing work. And I must say, I've been here for what? Four and a half months now?

And every day, I discover new capabilities that this agency has in all sorts of ways. And much of it is unexpected for me. And when you get down to some of the really technical work we're doing here at the agency, be it on cyber security or in other respects. And it's making sure that that work is well understood across the intra-agency too so that we're really marrying up what we're doing here at USAID with broader strategic goals and objectives so that -- you know, you called out that great work in the democracy sphere.

You know, this does become such an important part of strengthening democracy, stopping the backsliding on democracy is investing and strengthening this digital ecosystem. So thank you for calling it out.

MS. VORA: Yeah. Exactly. I mean digitization is happening. We have to kind of do what we can to influence its trajectory and doing nothing I think is just not an option.

So we once described you as a woman who is shaking up the world. I didn't want to mention that when I introduced you because I didn't want to put the pressure on, but

I'm certain the audience would agree with me that the label is well-deserved and we certainly hope you continue to shake things up at the agency particularly on this issue. You've been so generous with your time, yeah.

MS. COLEMAN: Thank you, Priya. And again, I'm very sorry to be late. I'm sorry for our own digital challenges we had here. And thank you, Priya, for all the great work that you've done in this space. It's terrific.

MS. VORA: Well, how about this? We will just plan to meet here again at another Brookings' event. We would love to continue the conversation. I know USAID has a lot of things coming up including what George Ingram mentioned earlier. Work to unite many donors and democracies around a charter for digital public good.

So there's lots more we would love to talk to you about. And I would really hope we would have a chance to talk soon?

MS. COLEMAN: Terrific. Thank you so much.

MS. VORA: Thank you.

MS. COLEMAN: Thanks. Bye-bye.

MS. VORA: And with that I'm so pleased to now hand over the baton to my colleague, Landry Signé who's a Senior Fellow at Brookings. Landry?

MR. SIGNE: Absolutely. Thank you so much, Priya. What a wonderful conversation. And I'm looking forward to continuing with those insights.

Now, let me come back to our panel. So I am Landry Signé and I am a senior fellow at the Global Economy and Development program. And today, I am very excited to be discussing an extremely important topic with wonderful colleagues. So as you can see, we have a distinguished panel on technology made on this this distinguished woman leaders.

And as you know, disruptive innovation and the fourth industry of our revolution. It is a call to my work. The fourth industrial revolution broadly defined as the fusion of technology, braving the frontier between the digital, the physical and the

technological world has immeasurable implication in the world in which we are living in. Whether we are speaking with about productivity, sustainability, poverty, security in amount order.

So what are the drivers of the fourth industry revolution? What are its challenges? And what are the implications for Africa and for the global itself? How can this fourth industrial revolution accelerate economic growth especially inclusive economic transformation? Quality job creation especially for young people, for women to generate and sustain their development.

This panel are on my first coming book, *Africa's Fourth Industrial Revolution* with the Cambridge University Press. It will be released this Fall. But also, and more importantly on a Brookings' report which will be released next week from *Existence to Disruptive Innovation Africa and the Fourth Industrial Revolution* coauthored with my colleague, Louise Fox.

And we bring those leading thinkers and practitioners to really understand the dynamics of the fourth industrial revolution to disruptive innovation and how they are contributing to a more inclusive and equitable world.

We have a panelist, Roslyn Docktor, Vice President, Technology and Science Policy and Vice President, Middle East and Africa for IBM Government and Regulatory Affairs. We also have Stefanie Falconi, cofounder of the Instituto Limite and has also been working with the world economic forum.

Louise Fox, nonresident Senior Fellow here with us that the Global Economy and Development program and the Africa Growth Initiative. And she has served recently as the chief economist for USAID. And finally, Lisa Witter who is the cofounder and member of the board of Apolitical and the CO as well of the Apolitical Foundation.

Let me start with you, Louise, to share the insight from our paper. So as the world's youngest contributor with the rapidly growing labor force and proving opportunities in Africa is particularly starting now and will remain even important given the number of young

people expected to enter the job market. And of course, after a couple of decades of sorely need growth and improvement in employment opportunities, we have seen enormous challenges rapidly COVID-19 global pandemic. And now, increasingly with the Ukraine crisis.

To what extent, Louise, could the new technology associate with the fourth industrial revolution accelerate the transformation of the continent by speeding up the creation of new wage jobs as well as expending higher opportunity sector, leading probably to the decline in the share of people working in formal sector. And to what extent could those dynamics will benefit young people? You are muted.

MS. FOX: Okay. Thank you. And it's really a great pleasure to join this panel and speak with this group about our joint work and other work that's going on in this exciting area.

I think most people know that the fourth industrial revolution, what makes this different is that it's not just digital. It's kind of a fusion of the digital and the software with other scientific areas like biological or mechanical or physical. So that you really have a really broad range of innovation and development of new technology going on.

Now, how is that going to affect Africa? And in particular, the journey that post-COVID Africa needs to undertake? Now, what post-COVID Africa needs to do is, of course, regain the trajectory of inclusive growth that they were on, you know, before COVID hit. And that means that they need to restart the economic transformation process, which was in the past 18 years of process of balanced growth which is why it delivered poverty reduction. Maybe not enough poverty reduction, but substantial poverty reduction by creating better employment opportunities.

And so, I think the question we are discussing with respect to Africa today is could the fourth industrial revolution help accelerate that transformation? And if so, would new employment opportunities be supported? And would they be inclusive? And as you mentioned given the fact that between 50 and 80 percent of Africa's employment is currently

informal. This question is really important as applied to informality. And the opportunities in both the formal and informal sector.

So as you know, our analytical framework that we used is we looked at the economics of technology adoption. And we looked at whether this technology will be adopted by African producers? And what we know is it will be adopted if it's cost effective in solving current productivity problems. So a good example of that is, of course, mobile telephony and mobile money, which was not only adopted in Africa, but adapted. And new innovation came from Africa and spread around the world.

Now, what problems did it solve? For producers of goods and services, communication, information, cheaper financial services, better connection with the clients. And so, it was both disruptive and inclusive in that way because it complemented labor. It did not just substitute for labor.

So what can we say now about the fourth industrial revolution technology? And will it be like mobile money and be disruptive and inclusive? So just to summarize a long paper that we worked on together with a lot of analysis.

We see the most opportunities in the service sector. Opportunities to expand formal services, to form, you know, the delivery of services in formal enterprises because it really complements labor. It doesn't substitute for labor. And it could raise and comes in informal businesses.

Now, manufacturing, there's been a lot of discussion about job killing robots. It probably won't jobs killed, but it probably won't create a lot of new jobs in Africa. And it will raise competitiveness problems.

Now agriculture, there are many opportunities and these have been widely discussed. But we see longstanding obstacles to technology adoption in agriculture. And these have to be solved first. And this has been shown by, for example, the use of fertilizer. Very old in agriculture. And these include the ones that have secure land tenure. These include weather risks, other price risks and an inadequate infrastructure.

And finally, one major point is to be inclusive, you know, African countries have to address all the skill deficiencies including the skill deficiencies in the informal sector. And not just digital skills, but problem-solving skills as well as some of the basic cognitive skills that really aren't being well taught in African schools today. So I'll stop now. I think I've said enough.

MR. SIGNE: Fantastic. We'll come back to you, Louise.

But, Stefanie, how those trend? How will they compare to the dynamics in Latin America? You know, we know that you have experience with Ecuador, Brazil and many other countries.

MS. FALCONI: Yeah. Well, thank you. It's such an honor to be here with such -- I feel very junior here. But I'm so happy to be able to share some of experiences from the global South and specifically South America where I'm currently based.

You know, as Louise was speaking. I remember a visual that I saw not too long ago of how -- what percent of jobs will robots take over? And if you look at the developing nations in some places of Africa, it's something like 80 percent of jobs. And in some places like Germany, Europe, more developed countries, it's like 15 or sometimes in very small.

And to me it really makes sense because so much of what we do in Latin America, and in some ways in Africa, are these manual jobs, you know. And they're easy to automate. So I want to zoom out just for a second and talk just a little bit about what happens in resource intensive economies. Where so much is central to the development agenda is talking about the presence of corruption and how resource economies are very ripe for lack of accountability.

And so, in my work specifically with environmental, I think we often don't have a real view of where our food comes from or what's happening in our forest. What's happening in the oceans. What's happening in the mines? It's easy to out of sight, out of mind and without some transparency, traceability and ultimately some form of enforcement,

we have a real issue in trying to green the global supply chain, which is something that we've been in the agenda as important.

You know, how do we create supply chains that are more sustainable? And I think this is a place where the fourth industrial revolution technology can really give us a hand. It is a place where, you know, traceability and transparency can definitely become more tangible. We've seen that both through remote sensing.

So we don't have to be on the ground to know what's happening in these forest areas. Or even in the oceans as well as, you know, block chain for traceability, AI. To be able in big data to be able to triangulate and also cross-reference where some of these products are going. And sort of, you know, what are those supply chains working?

And I think it's really important to bring that kind of macro for our economies especially as we start, you know, hearing more about ESGs and environmental, social and governance. And how that finance sector is going to affect this supply chains. And to ensure that we're not just greenwashing, but, in fact, we are cognizant of where those products are coming from and how they are affecting those regions.

MR. SIGNE: That is fantastic. And I really like the comparison. And this make me turn to Roslyn. How to make those disruptive technologies more inclusive? Do you have specific illustration? As we know the technologies specifically default the industrial revolution? Are inclusive of artificial intelligence? Lock chain, the Internet of things. Amount or the Cloud computings in that order? So how do we make those inclusive?

MS. DOCKTOR: Thank you for that question. Thank you all for your contributions. And we say AI, right? Everyone I think has mentioned the word AI so far.

I want you to know that IBM doesn't see AI as artificial intelligence. We see it as augmented intelligence. And that's where the human element comes in. That it should serve humans to accelerate their own potential. And it needs to be inclusive. So I'm really glad you asked me that question, Landry.

We're doing a program in Africa called Digital Nation Africa that's targeted at

different levels and different experience levels of people in Africa. The youth, the entrepreneur or the skilled worker to augment to their skills.

If they knew nothing about AI, take AI 101 class. If they know more, they can take more advanced classes. The Digital National Africa platform which is a pro bono Cloud-based platform available to anyone in Africa. You can go to it. For those friends here in the United States trying to get there now, you can't entry.

You can also -- it gives you Cloud space to make your own AI applications. To try out cyber security. And it has a third component where it uses AI to do job matching. So if somebody wants to figure out what is hot? What? Should I study AI? Should I study cyber security? Stefanie mentioned block chain. Is that the hot thing, right? At least they can understand what people are asking for.

There's some examples of somebody in Nigeria using Digital Nation Africa where they've taken their badges and they've posted. And they've become known as the IT man in the marketplace. And so, people go to them to increase their skills and to learn how to use technology. That's one example.

Other examples of people using Digital Nation Africa has increased their outlook of what potential jobs there are and what they should be studying and where they could be going. So that is one example of how we're trying to make AI inclusive. And so, that everyone can take part. Not only in using these tools but developing these tools.

MR. SIGNE: This is wonderful because you mentioned the inclusion of using the tools of building capacity, amount order.

And this make me think about the work that you are doing, Lisa. So what are the most important skills and mindsets which are needed to really capitalize on the fourth industrial revolution through agile governance, for example. And can one really learn those skills?

MS. WITTER: Thanks for the question. And hi, everyone that's watching. I can't help but be in a panel where anything around democracy is there and not just say I'm

sitting in Berlin and thinking about democracy and what's going on, on the footsteps.

In Berlin, we have refugees sitting in our home. We have like the whole force of what's going on in the world is so present in our lives right now. And I just heard news that the mayor that was kidnapped by Russian forces was just somehow released. It seems like your special operation and he went back to work to being a mayor. So talk about agile governance. I can't even believe the amount of political agility we're seeing with leaders right now.

So just to step back a bit. And frame it in this democracy, in this time where, you know, one big first principle thing I'm thinking about is I think many of us on this call, whether you're young or old, we were all thinking about sort of a post-Cold War era that we were living in. And maybe we're still in that post-Cold War era. But it was a good reminder, I think around democracy and governance and technology to always be questioning what our assumptions are because sometimes they're not right. So just for some principle, thank you.

So, Landry, back to your question. So an agile governance, Lisa set us up very nicely. Is really around what are those new phenomenon? And Roslyn was talking about this as well that we're having to innovate around. And particularly, I'm the cofounder of something called Apolitical, a global peer-to-peer learning platform.

Priya, I heard you talk about people need to learn from one another. Global peer-to-peer learning platform for people in government so public servants. To help learn from each other because as a fourth industrial revolution comes along how do we do things like regulate or not for the shared economy? Or for different platform plays? Or for augmented, I like that, Roslyn. Augmented the world in intelligence?

And then as public servants, you know, where are the different methods that we need to explore of it? But use technology in our more democratic in itself to advise government on how to do that. You know, what can you do in the field? What do you need to do in the law? And then what level of regulation do you need or not in order to have these

new fourth industrial technologies which Lisa is right. It's much more than just about the technology coming to play.

So what I thought I would just sort of leave to answer your question is, we've done a lot of look at what are the skills and mindsets that are necessary.

This morning, I was having coffee in Meta (phonetic) with someone from the foreign office in Germany. And I was asking him, like what are the skills and mindsets you're seeing right now that you're needing in government? He's like, I really need time to stop and think. And that's the first skills that we'll need. It's time for reflection.

Like so much of what we do is we go, go, go. How do you stop during this time to reflect? What does this all mean? And what skills and mindsets do I even need? The second is to be data literal. So this call across the board. This is one of the number one courses on Apolitical that we have is how do I understand not just data and digitization? But digitalization? How it's changing in anthropology? Of how we think about how we do governments and do government.

We need much more cooperation because the world is smaller now that we live in this technological age in some ways. Much more -- and we don't use this word in government, but I'm going to whisper it, experimentation. So I just say carefully try new things and share it with others. This adaptability. This deep need for curiosity you just need to be proactive. You know, not wait to react to what's going on, but proactive which is related to this experimental point of view.

And then very interestingly across our 170 members in 170 countries, one of the number one skills they say they need that they don't have as much of is a combination of effective communications with learning how to get buy within their governments. So you can have all those great tech. You can have all these great dreams, but if you don't have the skills and mindsets individually and then collectively and then teams and then across your government, if we're talking about agile governments from a government perspective. It's not going to happen. You have to start with the people.

MR. SIGNE: Absolutely. And, Lisa, for the one who may not know in the audience what agile governance means. Do you want to perhaps elaborate briefly on it?

MS. WITTER: Yeah. So I have a pleasure of -- Roslyn and I are cochairing and Stefanie and Landry, you're part of this, the Agile Governance council for the world economic forum. And what it just simply means is it comes from agile software development so it's a fancy word.

And by the way, when I talk to a lot of people in government, they don't like the word agile because it puts them on the defensive because it makes it sound like they haven't been doing this before.

Governments been working in these ways for a very long time. It's just we're using the framing of technology because we're in the fourth industrial revolution. But what it just basically means is just flexible, adaptable, open to learning, open, curious and fast. And I'll stop on the fast, Landry, because this is the tension, I think we have with Agile Governance.

There are new things coming onto the system very quickly. Governance particularly in democratic systems don't usually work quickly by design, right? They're meant to be consultative with people. And particularly if you have a role in government, you have multiple stakeholders and it takes time to get diverse points of views. So there's a real tension with Agile Governance and speed and the need for speed.

And I don't think that's been figured out anywhere. And maybe later I can tell you some of the case studies of folks that are really outstanding leaders that Apolitical and the council that many of us are a part of are really spotlighting some outstanding individuals and work that government and businesses are doing together to make Agile Governance work.

MR. SIGNE: Absolutely. This is really fantastic. And, Roslyn, I see you wanted to step in so please go.

MS. DOCKTOR: Well, I just wanted to say that the term agile comes from

the technology world that changed how they were developing software. So instead of one programmer working by him or herself to develop the application. They formed teams to quickly procreate and even if the technology wasn't perfect, they would launch it. Have others comment on it and then adapt it and scale it.

And it reminds me of a point that Louise made that it's not just the technology skills that people need in Africa to be disruptive, but it's that type of teaming collaboration. And what the tech world calls design thinking, right? Which gets to what Lisa was saying. How do you teach someone to be agile when we grew up all sitting in classroom and waiting until you're called on, until you raise your hand?

And if I can give one more example in what we're doing to disrupt education is something that started in actually Brooklyn, New York. But now it's global. It's in Africa and Morocco and Egypt. We're hoping to open it in South Africa. It's a new private public partnership with companies like IBM. We started this but other companies are joining in secondary and in post-secondary education.

It's called PTECH, Partners in Technology early college, high school. So it takes a student in post-secondary education and it's random. There's no test to get into this post-secondary education. Any student can get in. And then it gives them that they're post-secondary degree as well as a vocational technology degree like an associate's degree in cyber security.

And not only does it teach those technical skills but it also teaches that design thinking skills. And there's an example of a boy named Ahmed in Morocco who flunked out. Couldn't stay in school because he just wasn't motivated. And, you know, couldn't find his path. But he got into PTECH and he's now the top performer teaching others and will soon graduate.

MR. SIGNE: Wonderful. And I see that everyone is very excited about the portion. So, Louise, please go ahead. You are muted.

MS. Fox: There we are. I just wanted to build on what Roslyn said

because, you know, if the fourth industrial revolution is going to be inclusive. The private sector has to step up and play a big role.

And these examples of what IBM are doing are very important because right now Africa countries are spending about five percent of GDP or more on education. And of that about 20 percent is going to post-secondary education. And there just isn't a lot more money. And so, really these partnerships with the private sector to boost skills in various ways, in modular ways as Ros was describing, are going to be super important in making the future of technology inclusive in Africa.

And another issue we haven't really talked about is the cost of capital, financing in Africa. And, you know, one reason why I'm not too worried about jobs being destroyed in Africa by machines, by robots is those robots cost a lot and they have to be financed. The U.S. tax system subsidizes the cost of capital.

And we've been in a low interest rate environment. And so, that's why you seen so much technology adoption here substituting for labor. Even when it doesn't actually have an absolute advantage. But I don't expect to see that in Africa. What I'm much more worried about in Africa is all this technology will be too expensive to be adopted. So I think we also need to think about new ways of financing. And again, the role of the private sector is going to be really important. Angel investors, private equity, all kinds of different ways of financing that we're so accustomed to now in the U.S. But which have only just come to Africa in the last 10 years.

MR. SIGNE: Wonderful. And, Roslyn, just before coming to you. I just want to remind our audience that they can send your questions to events@brookings.edu or on Twitter at #TechforInclusiveGrowth. So events@brookings.edu or #TechforInclusiveGrowth on Twitter. Roslyn.

MS. DOCKTOR: To Louise's comment about investment. Technology can help to -- you had mentioned agriculture, right? We all know that 60 percent of Africa is farmed by hand with no machine. And about 50 percent of the crops go wasted because

they can't get to market.

And we're working with a small company called Hello Tractor and John Deere which is a big, you know, machine maker for the agriculture industry to help predict crop growth, predict yield in order to get financing, right? And to explain to government how you can do incentive policies based on realistic projections. So there is a role, right? I completely support public-private partnership, but there's a role to technology also to help understand how we can invest better and more smartly.

MR. SIGNE: And then Stefanie and then I will follow up.

MS. FALCONI: No, I actually wanted to come back to something that Lisa had shared because I think, you know, sometime in this conversation about the fourth industrial revolution where we get so excited about smart phones and smart cities and smart appliances and smart infrastructure. And we get lost that it's still the same human behind all of that.

And so, how do we make, you know, augmented human capabilities to go along with this, you know, this super tech that we have in our hands? And so that is directed to the things that make. Because the same technology that, you know, can make democracies work better is also the one that can spread misinformation. Or the one that is creating, you know, all kinds of other havocs.

And I want to come back to, you know, some of these skills that she talks about because I think ultimately, it's the people that we need to be thinking about. How do we skill ourselves and, you know, the workers. Whether it's in the public sector, the private sector or the education. And I really like this idea of, you know, data literacy, time for reflection. I feel like we are so inundated with data all the time. And somehow, we've contemplated that data means intelligence.

That just because we have information, we somehow have actionable intelligence and what to do with it. And in my work what ends up happening is there's, you know, a repository of databases that nobody knows what to do with it. Or at least nobody

that is in a decision-making capacity because they have so many other tasks that they have to do.

And they don't have the chance or the ability to go and, you know, do data scraping and then analyzing and cleaning. And I think that it is a role for -- I mean we have plenty of smart people that could do that, but I think we need more communication between whether it's the academics or the data scientist and the people that are making the decisions. Or in the case of what Lisa is doing. Is actually teaching some of those skills.

And I just want to give a shout out because I know that you guys have been working with the national administration school here in Brazil. And, you know, some of the work that they are doing that is all so phenomenal. And just bringing the capabilities so that we have smart devices in the hands of, you know, smart decision makers.

MR. SIGNE: Fantastic, Stefanie. I see this topic is very exciting one. So, Lisa, please go ahead and then I will come back to Louise with some questions on the challenges.

MS. WITTER: Maybe I'll bridge Stefanie from the skills, learning and then back to the inclusivity piece that we started this with which is in our research at Apolitical when we asked public servants because that's our world.

So we're talking about the private sector and the public sector and then there's even civil society. Lots of people play role in this, but we were particularly interested in how the public sector which controls 40 percent of the GEP and it's the largest workforce in the world. I know Roslyn was a former public servant. I did a former public servant. I'm not sure who else on the call has been, you know, serving at different levels of government.

In the last survey we did with them, this is a global survey, 95 percent said that they use nonwork resources to upscale. And very few like less than 60 percent said that anything they had access to within their government is where it was helpful. So back, Roslyn, you're talking about a lot of those skilling we have now of people in public service is back to the classroom instead of these more dynamic methods.

And I think COVID has really been a good shock to the system that way for governments. Is that they've had to just learn to do things how to do things differently. A bit more agility has been built into the system. We don't know if it's net positive or negative. We're still, you know, in the midst of that but there's some really agile muscles that have been flexed around this that I think have been good.

And now, we need to make that agility, that risk taking experimental time. We need to be reflective about it, Stefanie, and sit back and then say what have we learned?

On the inclusive, we run a big project along with the Gates Foundation around the generation and quality forum. So this was Beijing plus 25. This is the global commitment to how do we actually bring gender equality to the world. And we run cohorts of public service. And one of the top things that they say in order to advance gender equality, which, you know, we need in Africa and Europe and all around the world is they need gender disaggregated data.

And so, without the data, without the data literacy we cannot have real inclusivity. And they don't have gender disaggregated data. Let alone in many places intersectional gender disaggregated data. So that's really important.

Maybe the last point I'll make on this is that we're talking about augmented intelligence and how this impacts democracy. To your point, Roslyn, that around how it needs to be augmented? One real fear I have in this space. You know, there was early enthusiasm around technology. You know, I remember the internet coming in. It was going to be this fantastic place and everything was going to be fantastic. We had Web 2.0 and 1.0. And now, we're in Web 3.0. And I think it's early to say what this means because who's in? Who's making money? What does this mean?

What I do know that a recent survey showed that more than 51 percent of Europeans thought that even knowing the limitations of what other people call artificial intelligence that artificial intelligence would be better at governance than politicians would

be. And that just basically means that trust in institutions is low almost everywhere. And there's research that shows that if trust in government is low, trust in businesses will be low too because of the effect of just not trusting in institutions.

So I think that no matter what sector you're in, you know, investing and rebuilding trust in institutions will be critical to protecting democracy and being inclusive. And you cannot do that without workforce development. You just can't. You have to really invest in people.

MR. SIGNE: Wonderful, Lisa. And I really like how you connect the question. The democratic portion of accountability with the importance of inclusion in amount order.

Louise, in our paper so we discuss about and you highlighted them beautifully. Many opportunities in various sector and later in the service sector through ecommerce expanded to representing probably the greatest opportunity for formal wage employment using the fourth industrial revolution or the agricultural sector also which could increase far more earnings and a reduction of poverty. The manufacturing sector which can open new opportunity for smaller scale production.

So my question to you. What are the challenges that for the leaders and business -- both policy and business leader could face in really unlocking the potential of the fourth industrial revolution and of the disruptive innovation in generating quality jobs and more equality and sustainable development? And what is the wait for it?

MS. FOX: Easy question, Landry. Easy question.

MR. SIGNE: You tease.

MS. FOX: But we didn't mention identify three main buckets, shall we say, of challenges. One of them is indeed in this agile governance area and how to revise regulation. You know, a lot of African countries when they emerge from colonization, they kind of adopted many of the legal codes that their colonial masters had in the '50s.

And those are simply not adequate for today's world. So trying to figure out

how to revise them and be more agile is a real challenge. Things like tariff policies. A lot of tariff policies still think of anything with a chip in it is a luxury. And that is really not true anymore, right? A mobile phone is just not a luxury anymore. So that's the first part. And we talked about that quite a bit I think already. Although, I do love, Lisa, the idea that people prefer Chat Box to politicians and bureaucrats. My goodness.

Now, the second though are the gaps in physical and digital infrastructure. And we've really come to understand how important, for example, electricity, affordable, reliable electricity is because otherwise, you know, you can't use all this digital infrastructure, right? But in addition, cost. There's a big difference in how much a mobile phone package cost or even a low cost in net package costs among countries.

And you have countries like Kenya who've really figured out how to get it priced by the private sector in such a way that you get access. And also, South Africa and other countries that have not managed to do that. They don't want competition. There are a lot of other reasons. But there has to be a lot of attention to that. And to getting more available infrastructure internet in urban areas.

The labor force of today's labor force. And of course, of the government as you mentioned. So often, Lisa, and, you know, if the government itself isn't using these technologies, they often don't understand them. The private sector can do what they can and, Ros, I know IBM works on this very intensively to try to work with government to understand what are the policy issues and how different options affect it. But this skill issue, I think is really going to play a major role. That and the pricing of this technology is going play a major role in whether it's inclusive or not.

MR. SIGNE: Fantastic. And so, we know that Agile Governance is also trying to address many challenges including the pacing challenge. And pacing may mean things should go faster or slower depending on the context. Depending on the innovation. For example, in the context of the COVID-19, for vaccination production, what was the appropriate speed? Sometimes faster is not always ideal. So it's the appropriate speed

may also mean sometimes slower to make the due diligence. To ensure that the compliance.

But we also have the coordination of the growth variety of actors with the public, private, local, federal and international in various sectors as well. So, Lisa, what are we not thinking about that we should be when it comes to preparing leadership for agile ability?

MS. WITTER: We just -- so I am a cofounder of the company, but I'm now the CO of our foundation. And the Foundation's role is to really help build trust in politicians and public leaders so that the elected folks. And politicians I think are the least respected job in the world these days.

It different at different levels, right? Local politicians tend to have more respect than folks at the national level because trust is in proximity, right? Mayors tend to be better liked than others. And one of the things we do, we run the -- for the last 25 years I've been a political entrepreneur in running political training institutes around the world.

That actually helped prepare politicians to be policymakers, which is why I think people go into politics or should go into politics. And we just did a mapping. We're about to put out the report of 400 political training organizations around the world. And basically, none of them in any significant way are preparing politicians for the policy issues and even the technological questions that you see.

I know one of the groups that is maybe watching right now and I know is Twitting about this was Tech Congress. So trying to really help, you know, Congress people or politicians around the world better understand these issues. And where I see hope in this is that we have a wave of young people. If you look at the continent of Africa, you have so many young people but older politicians.

Younger people tend -- they're digital natives to say the least, right? For better or worse, they are born with a cell phone maybe not in the moment in their hand but quickly afterwards. And so, they're understanding the anthropology of technology. So I

think it's not enough just to say how do we kind of retrofit older political leaders? There are some great political leaders who are being retrofitted and are really open to doing this. Lots of politicians, older politicians are using TikTok and thinking about technology and regulation differently.

But I also think we need to think about more inclusive people who get into politics and really representative people. And we have a lot of work to do closing the gender gap. And it will take 145 years to get equal representation between men and women. If you look at many groups across the world, there's underrepresentation of disabled people, of LBGTQ. So if we want to have representative agile governments, we need representative political leaders and frankly public servants in that.

So it's not just about the skills. It's about the who? We need to work on that as well.

MR. SIGNE: Wonderful. And, Roslyn, how do we use technology to be more inclusive, democratic and representative? So two dimension question. So how do we better regulate -- better use technological advancements more democratically?

MS. DOCKTOR: Sure. Thank you. And I want to go back to what you said about agile. And like during COVID, we need to be, you know, the pacing is different. I want to commend the African leaders and many, many countries that change what a critical infrastructure, the definition of that and their regulation to include tech workers because when they had curfews, the tech workers needed to get out to help the critical infrastructure providers. Whether they be the telecos, oil and gas or energy companies to stay open. Keep their lights on and to do what we all needed to do so we could fight COVID.

So we have seen examples of agility globally including in Africa, right? And I think it's a time where you could pause and say when should policy be proactive? And when is it okay to wait and see what happens to be reactive because you don't want to slam the door on innovation too soon.

But to be inclusive as you asked, Landry, I think there is a role for

policymakers and we've heard this from the USAID leader, Isobel Coleman, in the session before this around AI and emerging technologies. There should be explicit policies now that says that AI should not be used to exacerbate inequalities from mass surveillance for human rights abuses.

There's a role for what we call precision regulation. You don't have to have all the answers and to have thought through because I agree as with what Louise said. That leaders need to know technology in order to set policy. Even in the U.S. we have that gap, right? And that's worldwide gap. But there's some things we can all agree on is common sense or at least shared values. And we can put that into law now that high risk AI, a technology that makes a decision without a human, which is not technology we do. But an AI that makes a decision without a human involved that affects our livelihood, that affects our health, that affects our income, our job prospects that should have an impact assessment before it's on the market. That should be tested for bias.

So I do think that there's ways to be proactive in a narrow way quickly and then help create innovation in other places on AI. Whether it's helping you learn how to paint or to, you know, create a new product. Let that go forward.

MR. SIGNE: Fantastic. Stefanie, you have discussed extensively many African trends in terms of opportunity to address inequality, to create jobs. We mentioned the critical role of the cities. And I know that your work on in South America has also focused on cities.

So can you share some insight about how the fourth industrial revolution is transforming those opportunities? The challenges faced? And the way forward in comparison to Africa or to other regions around the world?

MS. FALCONI: Yeah. I think that there's something to be said about South America. I'm based in Brazil, but I have visited other places. And I think we often forget that places here are, you know, a developing country but with a developed inside. You know, there's pockets here of highly developed areas.

So Brazil, you know, makes Boeing 707s competing in the market place with Canada. Brazil makes -- and I'm focusing on Brazil because that has both extremes. But I know Chile, Argentina, you know, some of the things that are coming out of these places are really great.

And I think that the challenges are sometimes to bridge that gap, you know. Because some of the services that are available for the elite or for the middle upper class is not necessarily the services that are available for all. And I think that's where, you know, making smarter policies comes in. But a great deal, I think, is being done in terms of identifying within cities, within logistics, within supply chains. Just identifying what are some of the bottlenecks.

So we talked about physical bottlenecks, of course. There is, you know, infrastructure issues and you will see a huge, you know, in the state of São Paulo versus some of the Amazon states. What infrastructures are available? What kind of physical digital infrastructures are available? It's huge.

But nonetheless, I think technology has been used in great ways to identify other types of bottlenecks such as, you know, other capitals. So human capital, financial capitals, resource capital and how we move those across the logistic chains. And also, I think when we talked about agility. It's not just building stuff. Not hard infrastructure but also how do we upgrade it? How do we maintain it? How do we manage it, right?

How do we find supplemental systems to the ones that are currently there? Because, you know, whether it's water or electricity some of these infrastructures are already aging. So how do we make smarter infrastructure so that it's easy to manage? To go with the demands with the growing cities with -- and I think all of that comes back to something I mentioned before.

So how do we put the right data in the right hands at the right time so that the information that we're gathering with IOT and, you know, the satellite data and all that is actually being put in a manner, in a way that decision makers can make something of it?

And I think that there are some great private sector that is doing that, but we want to make that sure that that's also being translated to the public sector.

And I have seen that there is quite bit in skilling. You know, the people that need to be -- and there's a reversal as well that I've seen which is creating open calls for issues that cities are having. And then letting the, you know, the startup ecosystem and the new ideas kind of flow in and see if they can meet those gaps. And so, there's a lot in terms -- I think where there is needs, there's always somebody to solve it.

And certainly, these Africans and South America are known for this kind of -- we call it hacking. You know, some call it agility. Whatever you want to. I think we're really great at doing that.

MR. SIGNE: Fantastic. And who are the leaders and the laggers when we're speaking about disruption, innovation and default revolution and stop America. What in term of countries? Or in term of cities? Stefanie?

MS. FALCONI: I don't dare want to say. There's so much happening out there. I don't know. I mean that I know that there are hubs and they tend to attract a lot of people.

I know, for example, I took part for some time as teaching, you know, startup about assisting really the startup world. And I know that Chile got very well identified for this. Chile startup so they would fund you as long as you came there and you made things happen. I know that São Paulo is a great hub because there's so many headquarters here.

And so, Google came and had their campus here. But I do not dare want to say -- I don't think I'm involved enough to say who are their leaders and the shakers. I think there's some really great people making things happen with -- big things happen with very little. And I really commend that. We don't have nearly as much capital as U.S. and Europe and India. Where you see great things coming out of.

MR. SIGNE: Wonderful. Lisa?

MS. WITTER: Well, just to help out, Stefanie a little bit. One of the privileges that as the collectively many of us had was an open call process for agile leaders. So these are agile leaders within countries around the world. And one of the most exciting things at Apolitical global peer-to-peer learning is that often innovation comes from constraints. And some of the best ideas out there are from Africa and Latin America or India. These countries that just have more constraints.

And what I find fascinating is we see reverse innovation happening where, you know, some poverty reduction program at Kampala reverses. It goes, you know, instead of from the north and south, the south to the north up to the Bronx because living in the Bronx is like living in certain -- so I love this sort of reverse innovation and how we could be all sharing more to not reinvent the wheel. Just imagine how much money we could put towards it.

But I'll just name a few people and just point people to this agile 50 list. There was one that we did in 2020 and 2021. Stefanie has been really important to that as have Landry and Roslyn in some way. So we have amazing innovators like the director of innovation, Bruna Santos at the National School of Public Administration in Brazil. A real thought leader if you want to call someone on Twitter in Latin America. I'm giving it for the Latin Americans here.

Stefanie as an honorary Latin American who happened to marry a German. I'm not sure how that happened. Carlos Santiso, he's Columbian. He's the director of the governance practice for the digital innovation in government.

So he knows all the best players in Latin America. And there are many more, but those are just two. But I really suggest you check out this Agile 50 because it not only talks about leaders, but it talks about also what they're doing.

There's just great stuff happening in the UAE and South Africa there's great things happening. And Japan on Sandboxes which is a way to do regulation. Mexico, you have the founder of OS City and so on. So there are great people out there. We can learn

from them and we can share best practices.

MS. FALCONI: Thanks for the reminder. Yeah, the Agile ordinance is such a great lift. And I agree. I think that the constraints that sometimes make -- I was going to mention the work of OS City, Jesus Cepeda. Who I met in person, but I think it's like reimagine what government could look like. Because it's not just about digitalizing things, right?

Okay. So we have everything in digital. But junk in, junk out. If it wasn't working when it was paper what makes us think that it will work when it's -- so, you know, how do we make those flow? You know, that flow of data work better? And those communication because sometimes many of these institutions were not made to communicate with each other smoothly.

And so, that's the next step, right? You digitize it and the digitalize it is the next step. How do you actually make that talk to each other? And that's the kind of work that they do. Thanks, Lisa.

MR. SIGNE: Wonderful. This is really a very exciting panel. So before completing possibly the last round if you have like in 30 seconds a final sentence that you want to make about the prospect of disrupting innovation in the fourth industrial revolution.

To really accelerate and perceive a transformation, quality job creation, especially for young people and women and sustainable development. Like 30 seconds, or one sentence. What is the key point you would be advising a policymaker in your respective region? Let's start with Roslyn.

MS. DOCKTOR: Thank you. I would go back to precision regulation, innovation and trust can coexist but we must root out bias in AI and then we can see the benefits of augmented intelligence through public, private partnerships.

MR. SIGNE: Wonderful. Lisa?

MS. WITTER: Don't forget the why. A lot of times, we get caught up in the what and the how in these conversations. And we have to say why are we doing this? And

not just in a defensive or reactive way. But what's the sort of world that we want to live in? Have we asked that question? And is the technology actually helping us or are we being responsive to a product because it's in front of us? So keep the collective why. Cocreate it with citizens and keep that as your real guiding force.

MR. SIGNE: Fantastic. Stefani.

MS. FALCONI: I'm going to go back to something that you just said that, you know, democracy is messy. And I just want to keep that in mind because, you know, I caution against rushing to some clever solution that, you know, promises to clean up messy problems without actually thinking what's behind it.

And I think what we need in this moment in time is, you know, how to make systemic improvements and much of that stems in public policy. And so, you know, just kind of muddle through that difficulties. But technology can help us make it more clear and transparent and open our institutions.

MR. SIGNE: Wonderful. And last but not least, Louise.

MS. FOX: I guess I would say to African policymakers remember that over half your voters are working informally on farms or small nonfarm businesses that they or their family run. And, you know, make sure that whatever policy you're making works for them.

Make sure they have a safe place to work. A place to keep their equipment, et cetera. And the technology is accessible and affordable to them. And that's how you'll get economic growth really. And that's how you'll get inclusive growth. So that would be my piece of advice.

MR. SIGNE: On these wonderful note, I would like to express our deep gratitude to our distinguished panelists, Lisa, Roslyn, Stefanie, Louise and also to our audience.

I would also like beside you, our distinguished speaker, to express our gratitude through the staff who has worked tirelessly here but both Noah and Esther Rosen

and Dan Laren. So thank you so much for making this event possible and I will finish by acknowledge the leadership of John Allen who has supported our work as well as the artificial intelligence and emerging technology in the (inaudible) team including Chris Morales, and Jessica Brown. This event is closed. Thank you very much.

MS. FOX: And thanks to you, Landry. Great job. Thanks a lot.

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