
2010 USAID Summer Seminar Series

July 8: M4D: How mobile phones are transforming global development

Panelists: Eduardo Jezierski, Vice President, Engineering, InSTEDD; Tom Kalil, Deputy Director for Policy, Office of Science and Technology Policy, The White House; Ted Okada, Director of U.S. Global Strategic Accounts, Microsoft

Moderator: Maura O'Neill, Chief Innovation Officer, Office of the Administrator, USAID

MAURA O'NEILL: My name is Maura O'Neill and I'm the senior counselor to the administrator of USAID and the chief innovation officer. And I feel incredibly excited to open this learning series. It has been a long history of USAID to be a – to be a voracious learner, but it is a particular priority of Administrator Shah. So we hope that you, during this session, will be not only a source of listening, but great information. I'm excited about the panel we have today, but also be a wealth of information for us as well. So we hope that you will think of some pithy and interesting questions as I told the panelists, it's okay and in fact encouraged if you have a different point of view or a different set of experience.

Please feel free to actually join in with your perspective or your experience or your assessment of what some of the challenges are. So this is an extraordinary time in terms of mobile phones. You know, every time I see a statistic like the fact that there is 4.4 billion mobile phones as of 2009, I know that we are rapidly outpacing that. So it is also interesting for me from a different perspective. You know, we are so struck by our differences, culturally, religiously, politically, economically, but you see this sort of ubiquity of Facebook worldwide or cell phones worldwide and you say that we have a deep, deep connection. We have a deep need to be connected to our family, to our friends, to information, et cetera.

So the purpose of this summer series is to take a look at mobile for development and see it both as a tremendous opportunity to enhance the issues that we care about, which is democracy in governance, disaster and humanitarian assistance, economic growth, quality of life, health and safety and food security.

I'd like to give you some idea of some of the applications that we're excited about and that we've seen take off, and particularly some ideas about in the different sectors. So we know in health one of the things we've been working with the Office of Science and Technology Policy in the White House on is an application that came up in the U.S. called text4baby. And almost overnight, although I'm sure the entrepreneur who put it together would not say it's overnight, it got about 250 private-sector partners and about 40,000 moms, almost overnight, signed up. What we know in the developing world is the number one health indicator for maternal mortality is the ability to actually have somebody in attendance at a birth, that that's actually a single factor. And so we also know that with respect to meeting our Millennium Development Goals, that one of the ones that we are really behind on as a world and that is reducing maternal mortality. And Office of Science, Technology and Policy (OSTP) and the White House had this terrific idea about, why don't we think about text4baby and its implications on worldwide. And so we have a team at AID in the missions and in D.C., as well as in Bangladesh and perhaps Rwanda and in Latin America, in Peru, who sort of took this concept and said, how does that actually track to other parts of the world and what made sense. So it seems like the text4baby architecture and business model really works for Latin America because it's aimed at individual mothers. In places like Bangladesh or Rwanda or sub-Saharan Africa, probably a different model that's really aimed at the health worker is probably the point of contact for cell phones.

We also know that with respect to mobile, there's some specific challenges. In Haiti, we were – it was a hugely important distribution network, but we also knew that people unlike us who are asked today to turn off our phones, for many people in the developing world, the cell-phone charging is the gating factor. And so the issue is you can't always assume that the cell phone is on and that it's charged or it's on some person. It's off. And as you know, a cell phone that's per family, but we're excited. In Liberia, USAID is introducing a software program to train health workers on the use of mobile phones to receive and store information. One of the things you'll hear from the panelists is that it's great that a cell phone is a platform, but in fact, where are we going to get the data and how are we going to get it?

I'm particularly excited about the opportunity that a cell phone gives the aspiring entrepreneurs. The president has wanted us, challenged us, as Americans, to re-imagine our relationship with Muslim-majority countries.

And one of the things that he committed to was a Global Entrepreneurship Summit. It was held a couple months ago. It was really one of the most amazing events I've been to. All of us go to a million seminars, a million conferences. And occasionally, they're off-the-charts incredible and this was one of them. And the budding entrepreneurship and the established entrepreneurship

in the Muslim-majority countries were interested. So as we were talking about how it is that we think about spurring more entrepreneurship, the notion was, well, why don't we just go in and train a lot of people to be entrepreneurs and why don't we – why don't we have business plan competitions? And having been a business-plan judge and actually teach entrepreneurship for a living when I'm not as USAID, you would think that I would be in favor of that. I am in favor of it, but I sort of said, off the mark, what if we enabled every mobile phone in the world to be a cash register and to be a bank that much like there has been an explosion with iPhone apps? I believe that the entrepreneurs will come, they will self-identify.

They will know, given local domain knowledge, what is the app that that neighborhood or my community or my village needs most often? So we embarked on a public-private partnership with the Gates Foundation that we announced to do mobile money or mobile banking or mobile financial services, whichever acronym you like – you like to refer to it in Haiti. And to give you some sense of the challenge, I was down there in Haiti about a month after the earthquake and under a tent, we had the central bankers. We had the two cell phone companies. We had American Red Cross because the first app was, as you know, the text donation service that ran in the U.S. during Haiti, raised almost \$40 million. The American Red Cross was going to take \$12 million and distribute it through cell phones as an enabling application to get people used to mobile banking, et cetera. They had used a company in the U.S. called Mobile Accord. So they were there. American Red Cross was there and some of the largest banks.

Despite the fact that we were outside and it was warm, if you could cut the tension with a knife, it was palpable. The central bankers started out by saying we are the bank, we are the bank, we are the bank – what do you not understand? And so they were clearly establishing that they were going to be the central point of control. Having established that early on, they later on said oh, I don't want that to be confused with the fact that we actually like mobile banking. So the two cell phone companies were not happy that American Red Cross was going to use a competitor, Mobile Accord, to potentially distribute this money. And so they acted as if they were completely cooperative and then they would take me aside and say no way on the face of the earth are we going to enable another competitor to come into Haiti. We're going to do this deal for this Red Cross and that's it. The regular banks were worried because they had actually made a fair amount of money on the service charges associated with remittances.

And so the fact that you could actually create a new competitive distribution mechanism so that there was less service charges for people both sending from developed countries or within developing countries to families or poor people, they weren't so excited. They sort of liked the margins that they had. And so this gives you some of the complexities of this.

The other thing that we found and why it's been a little delayed in distributing this 12 million (dollars) is that let's say we all live in an IDP camp and we are going to distribute this \$12 million. Well, prior to the earthquake, the average wait at a Haitian bank to actually get money or to make a deposit was two hours. And that was before most of the banks actually collapsed. So if we sent you a mobile message saying that use this code, this SMS code and go to your local bank and pick up your \$120, first of all, you would all flood. You would all flood to the exact same branch, which had neither the money nor the capability to distribute to all of you.

So the notion was we would just randomly decide. We'd take 10 percent of you at any time. Well, you can imagine the communication challenge if 10 percent of you got a mobile message saying that you only had – that you had to go the bank. All of us would want to know, so why did Dan get that money? Why didn't we get that money? And what it was. The other thing is, the cell phone chargers. Let's say I hadn't plugged in my phone for two weeks and then I plug it in but my ability to go pick up that money has expired. So I give you some sense of both the promise and the opportunity as well as the challenge of some of these mobile applications. But I am a huge fan of the fact that this is a transformational technology already with respect to communication, but in terms of development outcomes as well. So I'd like to now move on to our panel and have you have the benefit of their wisdom.

The first one we have is Tom Kalil. He's the deputy director of policy for the White House's Office of Science, Technology and Policy (OSTP). And I think that you ought to be proud of the fact that President Obama attracted an extraordinary group of smart, talented, make-stuff-happen people. He's on leave from UC Berkeley, where he is a special assistant to the chancellor for science and technology. In 2007 and '08, he was the chair of the global health working group for the Clinton Global Initiative and prior to that, he served in the Clinton administration – President Clinton's administration as the deputy assistant to the secretary for technology and economic policy.

TOM KALIL: Thank you, Maura, for that introduction. I wanted to echo a number of the comments that Maura made about the importance of mobile for development. But before I do that, I want to provide a little bit of context, which is that the White House just released a press release associated with the G-8, G-20 summit talking about U.S. global development policy. And one of the points that was made in the release is that the administration is really interested in increasing the prominence that innovation plays in U.S. global development policy. Maura and a number of folks on her team are doing an extraordinary job of actually pulling that off. We really think that this is an area of comparative advantage for the United States, given that we have 17 of the top 20 research universities, that we have this rich innovation ecosystem that includes large, established companies like Microsoft, venture capitalists, angel investors, small entrepreneurial firms.

So we really think that it's something that the United States can contribute in terms of the discussion about global development. Now, as we think about the opportunities to harness innovation for global development, it's no secret that mobile technology has really caught the attention of policymakers. And I think that's true for a number of reasons. First of all, just the sheer number of people that are – that are now mobile subscribers. Second is that continued reduction in cost and the improvement in functionality of mobile technology. So you all know about Moore's Law, which says that the number of transistors on an integrated circuit is doubling every 12 to 18 months with similar improvements, including our ability to store and process information and send information.

And so it's not just the mobile phone by itself, but it's also what that mobile phone is able to connect to. So one of the things that we're seeing is the emergence of applications where essentially, you're using the mobile device as a thin client and you are connecting to the planetary-scale supercomputers that we call cloud computing. So someone is able to take an image, have that image sent off to the cloud, have the cloud do – highly compute intensive operations like real-time machine translation and then have that image sent back, translated from one language to another. So as you think about the possibilities, don't just think about the mobile phone itself. Think about the mobile devices, this thin client that is able to access all these other computational resources. You probably read about IBM working on a supercomputer that can win Jeopardy and you might think of that as sort of a frivolous application. But imagine if every person in the developing world was able to have a natural language interface to a database that could, you know, with some high level of accuracy, answer questions that they had. So that is certainly not too far off in the distance.

As Maura mentioned, lots of exciting applications and the broad range of development areas, whether it's health education, democracy, better functioning of markets, disaster relief. And so I think another thing that is very exciting that is really a priority for Administrator Shah, that is, potential to do things at scale. You think about applications like M-PESA going rapidly to over 7 million users. I think it's probably higher than that at this point, but that's what it was around 2009. Or you think about, in the entertainment space, a small company called Zynga that, in a very short period of time, had 70 million users and the fact that the marginal cost of making a service available to more people is very low. So these are all reasons why I think the area of m-development is very exciting. So what are the types of things that different stakeholders have to do to maximize the contribution that mobile can make to development goals? Let me identify six quickly. First is developing countries themselves, I think, have an important role to play on the policy side.

There are huge differences in the per-minute charges across different developing countries and that is not all attributable to population density, although that obviously plays a role. So developing-country policy – are they taxing mobile phones as a luxury good? Are they encouraging competition which is going to lead to lower price and faster deployment of technology or do they have an oligopoly? The second thing, I would say, is that I think that we need to identify a couple of areas where we think that mobile technology could really make a big difference. And I want to echo Maura's focus on remittances. I think there's a tremendous opportunity to increase the volume of remittance to reduce the transaction costs and to try to increase the development impact of remittances.

So I think that is a great area to focus on. As Maura mentioned, OSTP has been a big fan of the text4baby initiative and I want to recognize Hillary Chen in OSTP. Hillary, if you're there – get to know Hillary. She's been working closely with USAID on the text4baby initiative and more broadly in the health area, increasing the effectiveness of community health workers. The third area that I think is important is increasing the capacity of developing country entrepreneurs to develop applications. And one exciting program that MIT has started is called EPROM, which has been working with computer science schools in Africa to increase the number of computer scientists who are prepared to start small businesses based on SMS applications. The fourth area I would point to is the importance of enabling technologies, so developing authoring tools and development kits that make it easier to develop applications like collecting and accessing structured information. I think there's also a real opportunity to increase the capacity of U.S. and developing-country research universities in this area. There's a tremendous interest in our schools of information, in our computer science programs here and around the world in harnessing information technology for development. Finally, I would say there's lots of opportunities for the United States in terms of reverse innovation. So we shouldn't just be thinking about, you know, innovation happens here and then we export it to the rest of the world. I think that in financial services, there are many developing countries who are ahead of the United States and we have a big problem in this country with the un-banked and under-banked.

And I think we would do well to figure out what's going on in developing countries and see how some of these things could be imported to the United States. So I share Maura's enthusiasm. I also appreciate the note of realism that she introduced about power, both in the form of electric power and power in the sense of political power and the incumbents don't like to be disrupted and the importance of thinking about issues related to political economy as an important – a note of realism for techno-enthusiasts like myself. So looking forward to the rest of the conversation. Thank you.

O'NEILL: Our next speaker is Eduardo Jezierski. He is V.P. of engineering from InSTEDD, which is a – sort of a reincarnation of Google.org. Prior to joining InSTEDD, he called his native land Argentina, his original home and excited about the ability to mine the talent and wisdom from all over the world. He joined Microsoft and he did a number of things there, but one – a couple of the things that I'll point out – he was dedicated to starting new businesses within Microsoft by providing an internal venture capital model and growing innovative practices, working with the chief software architect. He's also one of the founders of a team

dedicated to building software assets, tools, practices, frameworks, services to improve the quality and productivity of Microsoft's business customers. So I think he has an – and InSTEDD is aimed at health applications. So I think both his technology background, his applications background, his enterprise brings a unique perspective. So please join me in welcoming Eduardo.

EDUARDO JEZERSKI: Thank you, Maura. So a little bit of – by way of introduction, besides the one that Maura gave, I work at a nonprofit called InSTEDD. We are funded by Google.org and we happen to be founded by Larry Brilliant, who then moved to Google.org. But we're just a 501(c)(3) based in Palo Alto. And working there, I spend half my time in the field working in Cambodia and in other countries, helping improve health information systems, mostly through mobile technology. So in our work, we do open source technology for mobile health workers, reporting diseases, HIV reminders to people who have to have the continuity of care all the way to analyzing and understanding and visualizing the information on the backhand.

So there's a lot of nitty-gritty reality that I've had in my work around mobile health and development in general. And one of the first things I wanted to put out is that we, in high-income countries, see a lot of advertisements around rich devices, you know, the smartphones. And they obviously have a lot of potential in interacting with people who might have low literacy and so on. But the reality today and in development is that whenever you're choosing to do a particular intervention, you have to choose where in the spectrum of rich versus reach of experience that you want to have. If you want to have reach, you can do things like SMS and USSD and so to reach millions of people like we did in Haiti, where over a million messages were sent to survivors to help them find clinics that were open, where pediatric treatment was available, what to do in case of witnessing a rape, and so on. You don't want rich there; you want reach, right? On the other side, for – and the telemedicine and like self-led diagnostic tools for mobile health workers, you might want to provide a rich experience where the handset has a lot of functionality locally that guides the person with a lot of, you know, information displayed in a big screen.

But in any case, scalability is an important gating factor for a lot of mobile interventions today. I have found the field is littered with pilots. Pilots, pilots, pilots everywhere that never scale beyond 30 people or beyond three months. And the work to actually do the architecture the right way has been postponed. And when I talk about doing the architecture right way, I'm talking about working with mobile providers, understanding their business goals, seeing where the m-health and m-development goals might intersect with them, finding win-win propositions and doing a deal that helps both the country and the providers and sustain on, beyond the length of a particular project, helping explore those business opportunities together. When I'm talking about scalability, I'm talking about building systems in a way that you can just light up provinces for a new project, let's say for our tuberculosis program without even blinking an eye, like adding one more million users is just a good week or adding a new – 2,000 community health workers in a new province is just a good week.

And you don't have to worry about the technology scaling, really letting the human resources and the training of the people be the gating factor, not the technology. The technology's there to not be the problem. And the next issue is that mobile technology is incredibly personal, right? I mean we're reaching the point, as you said, where in some years, every human is likely to have a two-way radio in their hand and I think everybody in this room would say that is an under-utilized opportunity right now. But the thing is that there is a lot of ethnography to understand how people interact with each other through mobiles that has to be done to really design systems that are effective in the field. Is the phone mine or is it of my family? Is it managed by the woman? Is it managed by the man? Who pays for the credit and when? All these small little factors can make or break the success of an m-development or m-health system. So the question is how to understand all these factors. And the answer sometimes is get yourself out of the loop. Don't aspire to understand them.

Just empower local staff to understand them and to do the design and ethnography and the interaction testing, to make sure that they, with their local cultural knowledge can design the system in a way that will be accepted, adapted and extended by the locals moving forward. What we've done at InSTEDD is we've set up innovation labs. We have one in Phnom Penh, where we train local people to do interaction design, go out to the field, do rapid prototyping on mobiles of SMS applications, of rich applications on handsets as well. Do the development, do the quality assurance and then do this maintenance of the system ongoing. And by teaching them the right building blocks, right – how to do an SMS-based application? How do you do mapping? How do you do analytics of that information? How do you exchange information in disconnected environments? They can then assemble applications that are appropriate for their culture and their environment and that they will be able to sustain, right? And so in a way, you're creating sustainable innovation. And it's like two buzzwords put together, but when you see it in action, you know, how people can – with capacity, have an ongoing ability to invent what's needed and to discover where the gaps are.

So you haven't necessarily found a diamond; you've created like a mine, right, that just keeps creating good stuff. It's a good month where I go to the lab and they say, oh, let me show you the new application that we did to update information about free beds and clinics via SMS and it took them a couple of weeks. And my final point is architecture, another issue that happens with mobile development projects is that they don't integrate into an overall country system. So you end up with a lot of silos of data, a lot of silos of effort. The wireless providers are confused or sometimes they're not confused and they're actually milking the system, right, to benefit from this confusion.

So we started actually a public-private partnership to help countries have the capacity to do the health information system planning, including the capacity to integrate mobile providers into their architectures and make development part of the platform that they can give to other technology implementers. An example of the benefits of having such an architecture in place is seen in the Internet everyday where people put together services like Twitter and you know, Google Maps and Flickr and just be – are able to create and use mash-ups and systems with very little cost and weeks, right? A startup can create something in a month

and that's really innovative. But then somehow in m-health and m-development, that doesn't happen because architecture isn't there. By creating these platforms, for example, in Thailand, I recently found out that a company, over two months – just two months work with probably no funding other than a couple thousand dollars, connected over 700 hospitals to give real-time syndromic influenza information into a central database to analyze spikes in what people were complaining about when registering, right? And they did that with just a couple of months of development, one developer, probably little funding and that is enabled because of their architecture. So I export us in our projects to think about how to build a sustainable platform on which others can stand and let that local innovation happen.

O'NEILL: Our last speaker is Ted Okada. He is at Microsoft and he's the director of U.S. Global Public Private Partnerships. Prior to that, he was the director of Humanitarian Services Group, reporting directly to the Chief Software Architect Ray Ozzie. He's been involved in humanitarian efforts for most or all of his career. He's led teams while at Microsoft to respond to the Pakistan earthquake, humanitarian efforts in Afghanistan and was part of a rapid deployment that assisted the city of Galveston during Hurricane Ike. So please join me in welcoming Ted.

TED OKADA: Thank you, Maura. You know, I'm going to – just by introduction, my background is 20 years in NGO work in the '90s, more overseas with the bookend emergencies of Rwanda and Kosovo emergencies – founded the ICT Committee of Interaction. And I think just broadly, I just really appreciate Ed's comments, and Ed and I actually are colleagues from projects that we've done on incubating technology in the past. And I think I'm going to just sort of pull it back a little bit to look at the broader context within the context of – for example, the Millennium Development Goals. And I think Microsoft, as a company itself, is very committed to this idea of making sure that the digital divide is closed. So more and more, you're finding that the D1 countries, the Western world and the increasing gap with continents like Africa, is something that we want to definitely close, despite the fact that you have this rapid growth of mobile technologies in Africa.

And in particular, we're concerned about the issue of gender equity within that continent. So supporting programs related to girls and technology and science, technology, engineering and math – STEM-kinds of programs and curricular for young girls is something that we are very much committed to. And just a couple of observations that we'd like – I'd like to make in that context and make sure that we are always cognizant of the fact that while there are spectacularly successful programs, for example, the Grameenphone program which came out of Muhammad Yunus' program, the Grameen Bank and – has really grown the access for women to mobile technologies in Bangladesh. That is not the case in other continents.

And so that's something that I hope we consider. I appreciated Tom's comment as well on the issue of cloud computing and you know, essentially, basically, we're just talking about access to the Internet when you really boil it down. And so vast parts of – if you look at sub-Saharan Africa, why we have new fiber-optic cables reaching the port of Mombasa and Dar es Salaam. The great challenge is, of course, is how to reach, as Ed mentioned. And the reality is, in a place like Africa, mobile technology is the cloud, as we like to say. The cloud is, in fact, mobile. And so that means access to the Internet is going to be intermediated, largely, through mobile technologies. And so this is why we see such great promise for mobile applications.

In fact, this morning, we – Microsoft just made an announcement with Safaricom, the big mobile carrier in Kenya that in fact the most prevalent operating system for mobile devices, which is the Symbian Operating System, which is what Samsung and Nokia phones run on, something like 97 percent of the market in Africa. We just ported probably the most-used cloud application, which is e-mail, which everybody uses here in the Western world and that has been ported to the Symbian platform. So that announcement was made. So things are sort of progressing, but I think what we're also finding is that the backend, as I think the panelists have alluded to, is going to be the more critical thing.

The kinds of services provided by the public sector, the public-square, government services in the areas of health or agriculture for example – making those bits of content and data is going to be one of the biggest challenges I see. So second observation would be, as Tom mentioned, the rapid commoditization of mobile. So I – just a big hats off to a company like Vodafone, which tasked their research department to come up with the – sort of an opposite problem, get the least expensive OEM phone and come up with it and apply all your R&D knowledge to that.

And they came up with this thing – it was announced this past year – it's called the Vodafone 150 and it is a \$15 original equipment manufacture – OEM – cost phone. And it's a single body made of inexpensive plastic with a very inexpensive screen and at \$15, I, you know, what a brilliant maneuver. I think it's a great business proposition for Vodafone and their – I think – their commitment to expanding mobile. But you're finding that really, because of the cost of handsets just dropping to a very marginal cost, you're finding that this commoditization is just going to – just increase.

Related to that and the fact that we are committed to the Millennium Development Goals, to Ed's point on the reach – I'm going to just park here for just a second – in the sense that, you know, when you look at short messaging services, which M-PESA and a number of mobile banking applications are more and more using, you're still largely talking about what's called short-message services. But there is this other component that a lot of folks may not necessarily realize but it's heavily used in the developing world. And Ed mentioned it. It's a four-letter acronym. It's called USSD. USSD is effectively an SMS short messaging service that is largely internal to carriers.

And there's this fascinating guy – he just got his Ph.D. from MIT. His name is Nathan Eagle and he has a project called txteagle. And it was a number-one-rated presentation in terms of views on one of the latest tech conferences in the West Coast. And what he was saying was the sleeping sort of giant in short messaging is this thing called USSD. When you're in Africa, you're just traveling. You want to find out how many minutes you have left on your prepaid phone. You'll typically use a pound symbol, #611 or #311, hit another pound and in a couple seconds you get how many minutes you have back. Well, that service is indigenous and internal to that particular carrier.

So what Nathan argued was this is an opportunity for carriers and in Africa, the big ones are like MTN, Orascom, Zain, Warid. And those folks are going to start looking at the opportunity to add value-added services. And in particular, what is relevant to the public sector and the public square is the fact they can offer a particular trustworthy overlay to that particular service, a quality of service or a service level of agreement which allows for privacy.

This is quite important because for example, we take for granted in the Western world that we go to our local city and county – local regional government. We have, typically, an office of vital records, right? Who was born yesterday or this past year? And hopefully, why, through Department of Health Statistics Bureau.

In many parts of sub-Saharan Africa, you don't have that particular capability of just generating simple vital records and vital statistics which are critical to any epidemiologist, any health ministry.

If you were to combine the strength of a carrier's ability to guarantee trustworthy computing and extending that within the context of carrier, you have – so the recipe for, you know, a large leveraging of all types of critical public services that provide the enabling environment. So I see that as something that is, something that's quite promising. And finally, I'll just leave you this one point, two points. One is that when we look at, then, governments extending services – for example, with regards to vital records – the area of the policy-enabling environment, particularly in the case of data sovereignty, is going to be an increasing question.

So the legal, regulatory framework over what a government's sovereignty controls as data, as private data. Think of HIPAA compliance for health information for minor children. Those kinds of considerations, when a lot of the data might be – for a government, as they're thinking about it, and our U.S. government is no different – of what can actually be outsourced to the Internet, offshore, in a cloud-based environment and what needs to be the sole custody of that national government. That's increasingly going to be a concern. And certainly, within the policy framework, it'll be well for us to start that policy dialogue. I'll just leave you with one short story about the challenges of using cloud computing in the field of agriculture. There were many studies or tests – and even pilots and I appreciate Ed saying we often have too many pilots with not enough results.

I agree with him. So there were attempts to, for example, get rural farmers in Africa current five, 10, 30-day spot-pricing information for commodities like maize and so forth. And one of the challenges they found was that, while the project launched, the ability to either recover costs or actually incur usage, over the long term, was a little bit spotty. And so I found this – we're now in dialogue with this interesting project coming out of Reuters. And it's called Reuters Market Light and it was pioneered in India. And what it was, was the same sort of modality of having rural spot prices for agricultural commodities in Africa, or in a rural area, but combined that with traditional call centers, which in India is actually quite developed.

And so that particular combination of both the human, sort of, intervention – the human context – together with the technology just highlighted for me the fact that technology alone really won't solve all of our problems. And it's the classic, sort of, Aristotelian concept of, you know, is our theory of change really solid and coherent prior to deploying technology? And this is the classic thing for all technologies to fact. And I think as we start seeing, thinking through and engaging in pilots – and we should and we should scrape our knees and make lots of mistakes – but on the other hand, making sure that we really understand what is counterintuitive that we're bringing to the table, what is, in fact, epistemic – what is, in fact, our theory of change, grounding ourselves in that theory of change prior to deploying any technology.

Question and Answer Period:

O'NEILL: Well, now is the time for your wisdom and your questions. But I will just start out, which you're thinking about what it is, with one I'll kick it off with. Secretary Clinton has talked about changing our foreign policy aid from one of patronage to partnerships. And as an entrepreneur, I am struck by the fact that, how are we going to figure out the difference between assistance and entrepreneurship in the development of applications?

On the one hand, we've been – and the public sector can play a phenomenal role and if we aren't careful, they can play a quite disrupting role to private businesses and entrepreneurs getting into this. So how, as we look about some of these emerging

applications, do we figure out how to enable and spur entrepreneurship and where does, actually, assistance and aid, or the public sector, get involved? Anybody?

JEZIERSKI: Okay. Just one opinion from the field, just because I –

O'NEILL: If you can talk into your microphone and you can look out there.

JEZIERSKI: Sorry. Yeah, so one opinion from the field because we have our developers who actually are starting to say, oh, wow, with all these mobile tools, we could have, like, technologies for health, et cetera. We could have business models attached and make local companies.

So I think one of the things that can be done is working with the local providers, the local banks, et cetera, to provide – I think as you mentioned before, Maura – an infrastructure that allows flexible billing, reverse billing, transfers of money, et cetera, that allows a reach platform for monetization, right? And when you –

O'NEILL: So what I hear you saying is that where somebody like AID or others could provide some of the additional enabling applications, like billing, that, maybe, the individual entrepreneurs – maybe it's beyond the individual entrepreneur – but if they had an easy way to access a billing utility, maybe that would allow them to do it. Did I get that, or was it something else?

JEZIERSKI: Yeah, I think AID can help the private sector elements come together. We find ourselves, in our work, a lot of times, as teaching the mobile providers the business benefits of moving, like, up the stack, it's called. Stop just selling voice and SMSs; see what are the value-added services you can have on top.

So there's a level of, like, business training that has to happen. Then there's a level of technical training that has to happen. Services like USSD need some server configuration and sometimes, nobody in the country knows how to do it. So I think AID can help bootstrap that engine by providing those skills and capacities.

O'NEILL: And the others?

KALIL: I also think it's worth noting that one of the more successful services, M-PESA, grew out of a collaboration between DFID and the private sector. So I think there is a role for the government. And sometimes, in terms of taking something up to the proof-of-concept level, but then, if it's actually going to be scaled, that's going to require significant private sector investment.

O'NEILL: Great. Okay, how about the audience? What questions do you all have? Yes, right there? And if you could tell us what your name is and where you're from, that would be great.

Question 1 a: My name is Siobhan Greene and I'm from a company called Sonjara. We do a lot of work with USAID on IT for development. I wanted to ask some more questions about the role of policy as a hindering or helping factor, especially with entrepreneurs.

I know USAID has traditionally done a lot of work with policy, with banks, as well as with legislators in country, but hear more about what's going on –

NEILL: Are there certain policies that you think are necessary or certain policies that you worry about?

Question 1 b: Well, just the state of policy on communications infrastructure. I mean, I'm talking about the banks. For example, the banks may have rules about how you can't do digital banking because you need to have a piece of paper.

And that's got nothing to do with the technology component; that's got to do with the legal, digital signature component. And so I wanted to hear more about some of the challenges and some of the areas where, maybe, aid can lend a hand.

O'NEILL: Somebody want to take that on? Ted, do you want to?

OKADA: Well, yeah, I mean, maybe there's a – I mean, that's a very broad question, of course. I mean, you're looking at, for example, in sub-Saharan Africa, where the informal banking sector is actually rapidly over – you know, just racing so far ahead of the formal banking sector that it's causing a lot of, sort of – you know, in particular in East Africa, a lot of disruption already.

So it seems like the technology has a forcing function for that so, I mean, it's sort of a low-hanging fruit. I think in other areas it's much more difficult. You know, I come back to, you know, sort of broad notions. You know, I'm a big fan of Madeleine Albright and she's a fan of Hernando de Soto and this, sort of, larger issue of the policy environment related to property.

You know, he said, why are poor countries poor? Because in D1 countries, where you have wealth, you have these, sort of, invisible threads of the notion of property. Now, people may agree or disagree with de Soto vis-à-vis, you know, cadastral property, real property, but I mean, those notions of intellectual property are things that really cause businesses to scale. So when it comes to the enabling environment, you look at things like intellectual property.

So for example, if I'm a woman-owned business in Tanzania and I want to write an application for mobile, you know, I can capitalize my business at, maybe, 2X of trailing revenue. But if I have an internationally defensive patent with – you know, through a patent office in the national government, that actually was a decent passive office, then I can capitalize at 9X of training revenue. I can now franchise in adjacent countries. I can now brand globally. There are so many things I can do.

And so the scalability-sustainability issue is, can a local software economy indigenously grow? And what kinds of, sort of – within the regulatory framework, in particular, IP protection – be something that can cause – I mean, the most virulent open-source companies tend to have gigantic patent catalogs anyway. So I mean, let's be honest. Either we believe in strengthening IP as an engine for growth and innovation or not.

O'NEILL: Let me just add and then I'll get Tom in here. Just on a point that Ted made, a colleague of mine at Columbia did a piece of research that said, in the developing world, where there is actually intellectual property protection versus those that aren't, how much innovation do we see and how much technology adoption? And the paper, if I'm remembering it correctly, shows that where there's actually protection, it grows at twice the rate.

So the notion of the, sort of, conventional wisdom, or the urban legend that somehow, in the developing world, they're better off having no IP protection until they get to be a developed world – actually, this paper, I think, was quite illustrative in saying, actually, just the opposite is the case. Tom, you want to?

KALIL: Yeah, so I think one terribly important area is the developing-country policy to the wireless sector itself. Obviously, this technology is going to diffuse much more rapidly to the extent you have multiple providers, that you have, you know, low taxes on handsets and services, that the country is using its spectrum policy to encourage multiple entrants.

And I think USAID could be and other development organizations could be providing technical assistance to developing countries to say, hey, look, you know, there's another country in your same region that is seeing much more rapid growth in the wireless sector, faster rates of economic growth, job creation and productivity.

And it's because rather than one or two wireless carriers who are charging three times as much in per-minute charges, you've got a much more competitive environment. You know, even within the same region – even within, say, sub-Saharan Africa – you see significant differences in per-minute charges. And policy is an important driver of that.

O'NEILL: That's great. Okay, how about others?

Question 2: Hi, my name is Peter Goldstein. I work for InterMedia. We're a research company. We do a lot of research in media and communications in developing countries. I have a couple of questions. I think Mr. Okada brought up the issue of personal data and information and ownership.

This is becoming a big issue, I think, now, in Africa in particular. For example, in the whole question of – the fact that a lot of countries, for example, are asking people to now register personal information when they buy a mobile phone or buy a SIM card.

Ostensibly, this is to prevent crime-related activities, so they can track down people who are using mobile phones for nefarious purposes. But there's also a lot of concern about whether or not using new technologies – mobile phones could become a technology that's used against people, for surveillance and what have you.

And I'm wondering, from a policy perspective, whether this is something that's being addressed, either by USAID or other organizations. I'll leave it at that.

O'NEILL: Does anybody want to? Let's just talk about the privacy issue in general and then I can tell you some examples of where we've actually begun to tackle that issue. So perspectives on privacy, Eduardo?

JEZERSKI: Yeah, just a little bit. In our work with community health workers and HIV patients, we find that the first step is teaching the people about privacy – what is data licensing and things like that – as a first, you know, knowledge building-block on which, then, to build a conversation about what can be distributed to whom under what rights. And what is the implicit and explicit commitment that exists between the person and the provider that gets that information?

So we find, really, the issues of capacity-building first and then about the policy that expresses their new understanding of the problem. And it involves both the mobile providers and operators because they're the gateway to all the information, right? And

also, it involves the health providers and then it also involves where data's stored. Cloud computing is a very low-cost way of handling servers and so on.

And for example, we've had to work with governments of the Mekong area – including China, Vietnam and so on – to see under what policy biosurveillance data could be stored in the cloud, in American publicly traded companies' servers, right? So if you imagine the policy gap there, it's huge, and privacy is one of the big issues. But it starts with education and I think USAID can help in that.

OKADA: Just maybe a larger, sort of – yeah, sort of philosophical question related to this, which is, do we think of information as rights-based? So in other words, is there a rights-based framework to how we view information?

In particular, privacy rights to those who are the most vulnerable. So I love this phrase that this physician from the International Medical Corps once said at a conference. She said, you know, poverty is not being able to read, nor write, while others write about you. Poverty is not being able to read, nor write, while others write about you.

I think there's this whole area of, you know, as – there's this whole, sort of, extractive, exploitive – I call it industrial complex – which is really causing this disequity (sic) of – you know, in particular, again, focusing on young girls and women. You know, do they have the means to be able to maintain and manage their own data? I mean, just simple questions like that.

And I think, you know, from the broad perspective, let's look in the literature at those kinds of legal frameworks that worked in protecting, for example, IDPs or refugees. And look at information from a rights-based perspective and then, I think, the policy enabling environment, kind of, flows from that.

O'NEILL: Let me just say that I think your concern about policing and surveillance is actually a real one. When we were down in Haiti, we met with the Haitian police and we were talking about, essentially, a ubiquitous 911 system for the world, but specifically, where I could text you to say I'm in trouble, or something like that. And immediately, some of them defaulted to, oh, fabulous. We can tell where everybody is 24 hours a day. This, politically, could be very valuable to our party.

And so I think that, you know, in the issue of living in the real world, I think this is a genuine concern. And so I think that this issue of security, on the one hand, and surveillance on another, we've got to figure out both the policy and the technology. And I think it evolves over time. I don't think there's one answer as technology continues to evolve.

And I knew there's – getting back to the policy issue on this one as well – there's a team in the G-20 that's looking at, for example, mobile financial services. Because the issue there is also a security issue as well. So we have a team that's dealing with a whole range of policy issues. The only thing I would say, as an entrepreneur, is that we can get caught up in our britches on some of these policy issues and not move forward.

So just as we haven't figured out this policing power in the U.S., with respect to our urban areas, I think we need to be careful that we don't use that as an excuse to not let technology go out there, to not actually take some of the risks associated with some of these consequences that aren't so great. I think there was somebody over here who was interested. Yeah?

Question 3: Hi, my name is Ming Li-Wun from USAID, OIG. Thanks, everyone, for coming. My question is in regard to reach and, specifically, marketing. In the U.S., we've got TV and Internet to market our new products.

In your experience, how are new ideas, applications and whatnot distributed in developing countries? How are end users made aware and ultimately decide to adopt these new products that you create? Is it primarily through word of mouth?

JEZIELSKI: I can tell you a little bit about how we are working to advertise some of the systems that we've built in practice. What I've done is that the mobile operators actually have a very deep marketing strategy. If you've traveled in low-income countries, you've probably seen their advertisements all over the place, way deeper than any other brand.

And so the question is, how can you piggyback on that as part of your agreement to build this, you know, development and health architecture, to leverage that channel they have, leverage their support call centers and so on as part of rolling out an application nationwide?

So for example, if we do a system for a TB hotline, or something like that, people know that they can call the phone company support line – the same one they would call for, you know, problems with payment – and ask about this application. And we train the help center to be able to answer. So both in terms of outreach and scaling on the end reach of the consumers, working with the operator seems, in my experience, like a good strategy.

O'NEILL: Others? There was an interesting piece of research done in Africa. You know, in the U.S., we hate – and I say we in the royal we – we hate our cable companies and we hate our cell companies. And we like lots of other people – our church, or

different things. It turns out that the number-one trusted provider among your family, your church, your government in sub-Saharan Africa, in some of these countries, is actually the cell phone company.

And so that's sort of counterintuitive and it's because it's such a powerful technology. Not over family, sorry, but of the other institutions. And so what Eduardo said is really true. You know, we shouldn't take out Western views of how much those cell phone companies bug us in all their fees, et cetera, and make that to the developing world. It is actually the number-one trusted institution. And I think, in terms of marketing, we can think of that as a really important travel. There's somebody right here?

Question 4: Thank you. Is it on? My name is Andrew Mack with AMGlobal Consulting here in Washington. And we are a boutique firm that works with technology policy, public-private partnership development and related kinds of things. And a lot of our customers, a lot of our clients are tech firms. And so now, I'm just back from three separate trips this year to Africa.

So since we're talking Africa, we've talked about the idea of Africans as sources of data and as consumers of data. We've talked about the idea of Africans as potential producers of apps and that kind of thing. What we haven't talked about is Africans as consumers. And on my way back from South Africa, I stopped in Brussels for the ICANN conference, the Internet governance conference that was there. And we talk an awful lot about the fact that there's very, very little e-commerce that comes into or out of Africa.

As all of this is exploding, as the cables are reaching the two coasts, as all of these apps are being built, as more and more functionality that is Internet-like or Internet-related goes into the phones, what do the three of you – the four of you – see as the future of e-commerce? Because one of the big differences between commerce in Africa and in other emerging markets and in the OECD, more broadly, is this complete lack of e-commerce and the ability to access things online.

O'NEILL: Okay, great. Want to jump in? So how about you, Ted?

OKADA: I mean, with M-PESA, I don't know. I mean, Andrew, I know your friends. We had lunch a couple weeks ago. But I disagree a little bit. I mean, there's a lot of innovation happening in Africa – I mean, M-PESA, Safaricom –

O'NEILL: Can you just give somebody who doesn't know about M-PESA and Safaricom just, sort of, the headlines of what it is?

OKADA: Yeah, I mean, it's basically mobile banking. It started out with the idea that, you know, if you can send someone minutes – which was the core innovation that was really the foundation – that you know, I can actually send you minutes from my phone. And that became a proxy for cash, effectively. And then there's real equity.

Question 5: You can't click into the e-com system that we have.

OKADA: Oh, yeah, I understand. Okay, so you're talking about Internet-based. But to me, being able to exchange money within Kenya for services is commerce. And so to the first point I made, which is, in sub-Saharan Africa, mobile is the cloud.

It, in fact, intermediates between the Internet and the consumer. So in other words, you know, so many of the services that you would normally be able to do in banking over the Internet now is available, largely because of this really creative energy and passion that's happening with these amazing carriers.

And innovation's not stopping, right? I mean, in Uganda, you have MTN, which is a very strong carrier, but you have Zain and Warid. And the kinds of programs that these – the smaller, newer-entry carriers are doing is real commerce. And so I'm not sure whether we can say that it's not happening. I think those of us in the D1 countries have a lot to learn from the innovation that's happening in Africa, honestly.

O'NEILL: Others?

JEZERSKI: On another note, I happened to work in a lot of the early e-commerce development on the Internet, like all the formats for money exchange and billing between the credit card companies and a vendor. And that's, kind of, the infrastructure that really allowed – with the banking policies and the credit card companies – for e-commerce to evolve in our environment.

I would actually pose a reverse question: What is the e-commerce sector that exists doing to integrate with the new payment and goods-distribution architectures that are emerging in low-income countries as a new market opportunity? And what are they doing to integrate with M-PESA and the new PayPals and new credit card systems that they're using that obsolete the ones that we're familiar with?

O'NEILL: And I would say, as oftentimes in disagreements, my perspective is that both are correct. There's an enormous amount of innovation and the tie-in to really robust e-commerce systems is still to be realized. I know there's some questions, but I actually can't see behind here, so how about – yeah.

Question 6: I'm a health officer at USAID. Could you tell us about any of these models specific to health that have been taken to scale at a regional level? So I'm thinking about, for example, TB that tracks migrant laborers, specifically in sub-Saharan Africa, or IDPs or refugees. But has that been done, or are there plans to do so? Thanks.

JEZERSKI: I'll talk about it. Actually, in our projects in Southeast Asia, we're working with a regional network called Mekong Basin Disease Surveillance. This includes China, Vietnam, Laos, Cambodia, Thailand and Myanmar sharing disease information across borders and having a shared scorecard for improving towards health goals on a regional basis, including sharing of some of the information real-time.

One of the first things that came as a request, in terms of m-health applications for cross-border and regional things was simplified cross-border communications. Diseases and people and goods cross the Mekong River every day. And yet it's highly costly for somebody on one side of the border to call somebody on the other side of the border.

And sometimes, the policies of the countries don't really allow the health people to get together because even though the ministries of health are really innovative and are deciding to share and having these initiatives, sometimes the countries have their little frictions, right? So one of the things that we've done with this good architecture for country-wide mobile systems is integrate it at the international level through the cloud.

So essentially, what we have is somebody being able to send a text message in Cambodia to somebody across the border in Laos, receive it locally through a Laos provider. They reply; it goes back out and in through Cambodia, using a secure group that only they can access – I can't even see the data – and helping the cross-border surveillance work in that way.

And then share the information for their scorecards and their disease indicators in cloud servers, where the policy is determined by each country about what sort of information can go there or not. Hope that answers the question a bit.

O'NEILL: Are there any examples in this audience – we'll go to more questions in just a sec, but is there any more examples that you know of, of health applications on mobile that have actually scaled? Anybody? Okay, well, I hope a year from now we have a zillion hands go up because it's exploding. I think there was a question over here.

Question 7: We're working in Russia on HIV/AIDS control. Given the fact that the epidemic continues, with the fact that of every two people that are treated, five more get infected, I don't see any way out of it, given the financial situation of the global fund and also, our situation, except for prevention.

And we don't seem to be very creative in behavioral change and particularly with young women, helping them get control of the sexual experience. And I wonder if there's anything going on in behavioral change vis-à-vis HIV/AIDS?

KALIL: I don't know specifically about HIV/AIDS, but I do know that there's actually a whole conference now devoted to the field of mobile persuasion, which is trying to figure out how we take insights from social psychology and behavior-change communication and use mobile as a platform for delivering those messages.

O'NEILL: That's great. So how would somebody – would we just Google or Bing mobile persuasion? Is that how I –

KALIL: Yes.

JEZERSKI: I want to comment a little bit about that. One of the – you know, if you think about the whole HIV areas of prevention and doing the testing, and then the continuity of care, obviously the ability for community health workers and the patients themselves to have mobiles is opening a lot of doors.

Where I think the gap still exists is in having that local ethnography, that local interaction design, to really try out what are the sorts of mobile persuasion techniques that work in a given culture and a given economic sector and really building local capacity for that interaction design to discover what are the sorts of things that can work.

For example, in Cambodia we have a system that sends HIV treatment reminders, that originally was targeted towards patients. And the patient wasn't going to get persuaded by getting a text message if they weren't planning to go to the doctor anyways. But we sent it to their community health worker who knows them, who gets them out of bed and says, come on, get to the clinic, you know. The bus is coming on.

And by changing the design of the system, it became more socially acceptable. And I think it's that sort of experimentation that is needed. Obviously, the opportunity is there. It's really untapped.

KALIL: I think one really exciting thing on the monitoring and evaluation side is this ability to do low-cost experimentation. When you talk to online companies and you say, how is it that you keep on getting better, it's that they might be agnostic about what the best way to do something is and they do hundreds or thousands of experiments in parallel and they figure out what works.

And so I think that's a very different paradigm then, all right, we're going to try to do something for three years and then we're going to, you know, spend another three years doing a randomized-control trial and then we'll know what the right answer is. So this seems to be a really different methodology that we had to figure out how to incorporate into the discussion about how we do M&E.

O'NEILL: Yeah, I think that's absolutely right. I'm from Seattle and my husband works at Boeing and so I always use this example, but I think that Tom and Ed are absolutely right. If you take a Boeing plane from Seattle to Dulles airport, it basically – you can put it on autopilot. It will fly and land all by itself. But when you program in, go to Dulles, in one flight it will make 3,000 course corrections.

And so I think that we have got to figure out how to reduce cycle time in terms of this learning. And so when we find out that the text message isn't working, we build into the program design and we build into the monitoring and evaluation a quick – you know, as somebody said, no or a failure is the second-best answer, meaning the second-best quick answer. So what we want to do is to fail quickly so that we really have that correction to the course.

JEZISKI: Always make new mistakes.

O'NEILL: Yes, always make new mistakes. That's another way of putting it. So I think that we have an opportunity with these tools. A friend of mine, we used to sell banner ads. And of course, John Wanamaker, the very famous department store executive, said, I waste half of my advertising dollar; I just wish I knew which half it was.

And so originally, we put banner ads up, but people took that old model of, well, gosh, is it on rei.com or is it on Outdoor magazine that I should put this hiking equipment? And a friend of mine developed a technology where they just randomly presented it, sort of, with keywords all over the Internet, and if it hit, it just slammed that site.

So within an hour at least, 24 hours at most, it knew exactly. So it didn't make a decision ahead of time; it let, basically, the wisdom of the crowd, the wisdom of the Internet, to self-reveal where that customer was. I think these are just examples of ways that we need to change our thinking and embrace this new technology as ways of continuous learning. I think there was a question over here. Yeah?

Question 8: I have a two-part question: The first is about reach and the second is about SMS. Although there are over 4 billion phones in the world, only a little more than 50 percent of the developing world has access to a phone. How do we increase that, whether it be working with telcos, regulations policy, et cetera, so that we're getting to that last mile, so that we can actually talk about people who don't have phones and they can get all of this great stuff that we're talking about today?

The second is about SMS: Every application that we've heard about today is on the SMS or USSD platform, that I remember. And what about going to a richer environment like J2ME and what are your thoughts on that? Because SMS is great, but there are sometimes problems with security and there's a lot of problems with illiteracy and how to overcome this and the tediousness of remembering different codes.

O'NEILL: Great. So let's take the first question first and have some panelists talk about it, which is this issue of access and reach and distribution. So what are your perspectives on that?

KALIL: Well, I think we heard that the handset is getting down to \$15, so it –

O'NEILL: So that's part of the solution.

KALIL: It doesn't seem like at the handset we're talking about an insuperable barrier to access. I do think that, as I mentioned, there are a set of things with respect to telecommunications policy and tax policy that are going to make a difference, in terms of lower costs per minute.

Another point that I made was the value of spinning up the research community in this area. So there are people who are really interested in this question of access and so they'll start saying, okay, as opposed to the traditional cell infrastructure, could I develop, you know, an open-source infrastructure that would be thousands of dollars as opposed to hundreds of thousands.

And an equipment vendor might not immediately rush to that solution, but the private, the university sector can do, kind of, the proof of concept. And once it's out there, it's going to get picked up. So I think that the research community, if you say, hey, how do we connect the last billion, they will come up with new ideas.

O'NEILL: Yeah. I also think, to go back to your opening remarks about power, the telecommunications and the tax policy as others, but I also think we've got to solve the charging issue as well and a cost-effective, wide-scale deployment issue as well. That will require new innovations on that technology side as well. Ted?

OKADA: You know, there's a – this is a USAID panel, so I come back to, sort of, the Friedman, "women are half the sky," kind of argument, which is, what can we do to really reach women and girls?

I hate to be beating on this enough because when you think about the kinds of solutions – for example, Iqbal Quadir and Grameenphone, you know, here's this wonderful problem, the Grameen Bank reaching thousands of female, women entrepreneurs in Bangladesh and then, all the sudden, kicking off this amazing reach of exclusively, almost 100 percent, women-managed phones to run their operations, their companies, their little businesses.

I mean, the potential that you have with just a little bit of investment, just focusing on empowering girls in particular, through education, to be able to manage businesses and enterprise with some old technology – if we're intentional with it, I think the payoff is enormous. So you know, teach a man; he'll raise a family. Teach a girl and she'll raise a nation – right, the Arab saying.

O'NEILL: Great, thank you. Let's go to the second part of the question, which is the SMS. So we talked about SMS and the questioner said, but what about all rich applications that need and get a lot of value beyond an SMS?

JEZIERSKI: I'll just talk from the practitioner's perspective. I mean, you do both and you have to just choose which one is the right one for the context. When you're targeting a more rich application, you get into the issues of phone variability and how the different keys react. Then, when people lose their phone or it breaks, they go to the secondhand market and buy another one and now the application behaves differently.

Distributing and deploying that application has a cost; that's another place of collaboration with providers. You know, providers can send applications to phones if you work with them. So it's a matter of picking your poison, really, and choosing where is the right balance for each particular context, which is where the local skills and interaction design and having a rapid, agile, local way of designing the technology really helps you.

Because you could very rapidly iterate through a lot of these different options and find what is appropriate in a given context at one point in time. And this is technology, so whatever we're talking about now will be different in a near time in the future, so you've got to keep that exploration going.

KALIL: We've been talking a lot about collaboration with carriers as something that is really critical to making these things scale. One of the things I'm interested in is that there are beginning to be some conversations about the middle space between, on the one hand, corporate philanthropy – things that companies are doing for corporate social responsibility, for brand, for employee morale, where they're not expecting to make any money at all – and on the other hand, things that firms will do because they think it's going to maximize return on investment for shareholders.

And what I think might be an interesting area to explore is the things in the middle. So we talked about Grameen. Dannon, the French yogurt company – or Danone, as they would say – has a collaboration with Grameen to produce fortified yogurt from local milk, using low-income Bangladeshi women as the sales force.

And what they concluded is that they would be able to break even and maybe they would be able to get a 2 or 3 percent return on investment. And then if they went out and did a lot of projects like that, that were below whatever their hurdle rate is, that that would, you know, undermine the profitability of the firm. But rather than giving up, they said, well, what if we set up a separate financial instrument to be able to support those types of projects that our employees and shareholders could invest in, knowing that they might only get this lower rate of return?

So I think what would be really interesting is to figure out whether or not you could encourage cell phone providers to establish a social business unit, where the value proposition for them is going to be, you know, not necessarily that they will get the same ROI that they got on everything, but it would be, sort of, the interface point for governments, for NGOs, for international development organizations.

And the notion is, hey, you know, you're not going to lose money. We're going to make sure that you at least break even. And that, I think, would be an interesting institutional experiment.

O'NEILL: Yeah, I think that's – I think we do have an opportunity for innovation in a lot of business models and I think we've just begun. My husband once told me, years ago, best to leave a party one hour too early than one hour too late, so we – I know I've learned a lot and got a lot to think about as a result of the panel.

I hope you have as well. Thank you very much for coming and please join me in thanking this really terrific panel. We look forward to seeing you at the next summer series.