

THE BROOKINGS INSTITUTION

MOBILE TECHNOLOGY'S IMPACT ON EMERGING ECONOMIES AND GLOBAL  
OPPORTUNITY

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**Welcome, Opening Remarks and Introduction:**

DARRELL WEST  
Vice President and Director, Governance Studies  
The Brookings Institution

**Mobile Technology & Enabling Economic Opportunity:**

BROOKS BOLIEK, Moderator  
Technology Reporter  
POLITICO Pro

WILLIAM BOLD  
Senior Vice President, Government Affairs  
Qualcomm Incorporated

**The Global Mobile Ecosystem: How it Works and Who Benefits:**

DARRELL WEST, Moderator  
Vice President and Director, Governance Studies  
The Brookings Institution

SANJAY PURI  
Founder and President  
Alliance for U.S. India Business

KISHOR NAGULA  
Senior Manager  
Caribou Digital

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## P R O C E E D I N G S

MR. WEST: Good morning. I'm Darrell West, vice president of Governance Studies and director of the Center for Technology Innovation at the Brookings Institution. And I would like to welcome you to our summit on mobile's impact on emerging economies and global opportunities.

And we are webcasting this event live, so we would like to welcome our viewers from around the country and around the world. We also will be archiving this video, so anyone who wishes to view it later, can do so at [www.brookings.edu](http://www.brookings.edu). We also would welcome any questions or comments that you have. We have set up a Twitter feed at hashtag-TechCTI; that's hashtag-TechCTI, so you can post any questions or comments that you have on that site.

Mobile technology represents a growing part of the economy and the driver of considerable economic growth, the global mobile economy now is estimated at \$1.6 trillion, and is projected to reach \$2 trillion by 2017. We know that mobile technology has created new industries and revolutionized both business practices and the societal improvements worldwide, this has created enormous economic opportunities for billions of people, and it has enabled new forms of learning, health care, disaster relief and poverty alleviation.

But despite the importance of mobile technology, there remain barriers to innovation and invention. There is considerable variation from country-to-country in how it handles this sector, plus there are macro barriers in the sense that two-thirds of the world's population is not yet connected to the Internet. So we need to figure out how to build the mobile ecosystem and extend the benefits of mobile to many more people.

Today, we are going to discuss the factors affecting mobile investment and invention around the globe. We have two panels. Our first panel is going to look at

mobile technology and how it enables social and economic opportunity, and we are pleased to welcome Bill Bold to Brookings.

Bill is a senior vice president of Government Affairs at Qualcomm, and in that position he manages the company's public policy agenda, and its relationship with government entities and related organizations at the international, federal, state and local levels.

He also manages a global group that includes people in the United States, Brazil, China, Belgium, India, France, Korea and South Africa. I think that sounds like more than one job there, but. And before joining Qualcomm, Bill worked as a director of public policy for the California Health Care Institute.

Interviewing him will be Brooks Boliek. Brooks is a technology reporter for POLITICO, and he has covered a wide range of technology topics in Congress and the White House, and also at the Federal Communications Commission, and he also has some international interests as well. So he's very knowledgeable about technology issues, and I will turn it over to Brooks.

MR. BOLIEK: Yeah. I only have one job but I do it for POLITICO, so that means that I do it a lot. Everybody -- it's great to see everybody here. Bill, let me just start out, I have a -- one of my best friends sent me a picture the other day of where his daughter is in the Peace Corps in Ghana. And the picture was of the village where she is stationed, and it's one road, and on each side, what would look like mud huts. I think they were mud. I want to say they were whitewashed, but they were kind of a green tint, so I don't know what they were using to tint their paint. What does mobile technology do for a place like that?

MR. BOLD: Well, thank you, Brooks. And thank you, Darrell, for that kind introduction. Without knowing specifically the village you are referencing, there's a

lot that mobile broadband has and will continue to do for rural communities around the world, and the first thing is simply attract investment.

Most of the world, as Darrell mentioned, is not yet connected to the Internet at meaningful speeds. There are about 7 billion wireless connections in the world, and that corresponds to about 3.5 billion unique users, so it's about two connections for every unique user. But a lot of those connections are second-generation, as the folks using their phones for voice, maybe a little bit of texting, but not the type of wireless Internet experience that we've come accustomed to in this country.

So when wireless technology mobile broadband gets introduced into a market like that you get an enormous increase in investment, because you are leapfrogging an entire generation of technology. You are going from, you know, maybe no phones at all, or very simple basic, essentially disposable voice phones, to phones with displays that browse the Internet, can connect to data services and value, enormous value for the user.

So, we've seen in lots of emerging regions who are just now auctioning spectrum for 3G and fourth-generation technology, you know, companies falling all over themselves to get at that market opportunity. That's great for the GDP of the country in question.

On a more human level, mobile broadband unlocks a host of social services that can really transform communities. Just off the top of my head, my group manages a kind of a strategic philanthropy program at Qualcomm called Wireless Reach; we've got about 104 advance mobile broadband --

MR. BOLIEK: They are getting wireless.

MR. BOLD: No. We love that. We love that. Never tell -- we never tell anybody to silence their cell phones. A hundred and four projects around the world,

doing advanced wireless projects in both developed markets, but even more so in developing markets. And I'll give you couple of examples of things we are doing.

The first is a program actually not in Africa but in Indonesia. We essentially sell a micro business in a box, in partnership with the Grameen Foundation in very rural parts of Java and Sumatra. These are villages that don't have access to telecommunications, and we give village phone operators, which are mostly women, about 82 percent of the operators are actually women, we give them a mobile phone with a 3G data connection.

And they then resell not only voice time to their neighbors and their communities, but also advanced data services. So things like job board postings, where can I get seasonal work, information about weather for farmers, stuff that we would take for granted, but it's really revolutionary in Indonesia. Every one of those village phone operators is profitable, and it's basically lifting women up in that market. We are doing similar things in Africa.

More close to home, in Africa, we are actually looking at ways to develop applications to help frontline Ebola workers get information about the spread of the disease, communicate that back to the WHO, so we have sort of a real-time map of what's actually happening with Ebola. So from health care to entrepreneurship to education, mobile broadband lifts the floor for all these communities worldwide.

MR. BOLIEK: What sort of barriers are there that keep you from pushing these advanced services to less developed countries?

MR. BOLD: Well, the one thing that our industry needs desperately is -- two things, investment first of all, so we need, you know, countries that welcome foreign investment, that don't have the sorts of restrictions on, you know, American or European or Asian investors coming in and putting money into their economies. So, you know,

those countries that don't have direct state control, or even ownership of the mobile networks, that's an important step.

And the other one is spectrum. Spectrum is the real estate that our industry depends on. And what we found is that those countries they are most aggressive about making the hard decisions to free up spectrum to say, look, we've got to move to new technology platforms, we can't, you know, essentially do the same old thing of catering to incumbents; those are the countries that get the investment, those are the countries whose networks come up to speed the quickest, and the ones that are frankly doing better of the (inaudible) internationally.

MR. BOLIEK: So, you mentioned spectrum, and so did most of these countries, did they auction off to spectrum, like we did?

MR. BOLD: It's a mix. I think, you know, auctions have become very popular, it's a great way to meet your budget and pay the bills.

MR. BOLIEK: Forty-two billion popular, I guess.

MR. BOLD: Oh. But it very much depends on -- you know, we can't comment, obviously, on the current proceeding in the United States, but around the world, you know, money is flowing into some, you know, fairly surprising places. I mean, I just met with the Pakistani regulators a couple weeks ago, and they have, you know, companies falling all over themselves to get into that market.

They have a little bit of third-generation communication basically in the big cities; Karachi, Islamabad and the like, and they now want to move to fourth-generation and spread that out through the world, regions which are terribly underserved in Pakistan. And that's a country that's gone through, you know, a lot of strife, a lot of political instability, and you still have, you know, enormous desire to get in there, to address, you know, what's basically a completely unserved market.

MR. BOLIEK: I was kind of struck by what you said about the person in Indonesia that becomes an operator; because being a telephone operator was also one of the first jobs for women in the United States, when you used to do wire-line, and literally the operators had a switchboard in their house, and they would plug in BR549, or whatever. So basically these countries aren't going to do any wireline investments?

MR. BOLD: Well no, they will do wireline. I mean, eventually a wireless connection gets to a wired network and to the Internet, so there has to be some investment. But you look at a country like Indonesia which is an archipelago, the Philippines is another very good example; it's impossible, literally, to connect all of those communities in the rural part of the country.

If you meet with -- as I've had the good fortune of doing -- meet with Indonesian federal officials, they are, you know, just hyper focused on, how do we develop Eastern Indonesia, which is a pocket of small islands plus Papua New Guinea, almost impossible to connect with wires. You've got to connect wirelessly, but then there's got to be a backhaul, there's got to be the fiber of network you eventually connect to, which may be the big city, to the west or Chicago, or what have you. And so it's a mix, but that last-mile connection is definitely going to be wireless, in most parts of the world.

MR. BOLIEK: So, does that -- the experience that you've had internationally, does that translate to the United States to -- you know, there's always problems with the universal service, you know, reaching people in the rural areas and connecting people to broadband. It's a big push by the President, it's a big push of the FCC, they are going to do rulemaking tomorrow in the Connect America Fund, Phase 2. I mean, do you -- do we have those same problems here, or do the problems come with a different flavor?

MR. BOLD: Well, we've got a big country. You know, it's a very different

situation than, we'll be running too, in lots of European countries where the population is much more concentrated. I mean, what I can say about what we do at Qualcomm, is we invest a lot of our research and development, we've invested about -- cumulatively about \$30 billion over the life of the company, about 20 percent of our revenues go right back into R&D every year, and a lot of what we invest in is designed to solve these very problems.

In fact, there are really two problems that we've been looking to address. The first is, congestion in the big cities, in markets that have really high wireless penetration, to make sure that we can expand data capacity by as much as 1000 times over the next 10 years. And we are going to do that by deploying small cells, so a cell, you know, no bigger than this connects into the wall, it's technology that Qualcomm helped develop, so these small cells can work in a network without interfering with one another, and you can greatly amplify the capacity that the network has.

In rural areas, we are looking at ways to make spectrum use more officially, we are looking at ways to utilize lower bands of spectrum, which have great propagation, can cover more of a -- kind of a wider range. Things like the 700 megahertz band, very important in that respect. So a lot of what we do in R&D is really design to solve, or help solve, the problems of the policymakers we are dealing with here, and around the world.

MR. BOLIEK: And all of those things are kind of odd to me. I mean, when I think spectrum, I think of like AT&T, Verizon, T-Mob, Sprint, the Big Four, you know, but what you do also has a huge impact. Like you are talking about these small cells, these mesh developments, particularly in the big cities. I know you can't comment on the ongoing auction at the FCC, but if you look at the auction, the auction website, New York City, Chicago, Los Angeles, that's where the bulk of monies go.



So, I mean -- So, is it easier to do the big cities with these kinds of deployments? You might have already answered that question, but let me go ahead and drill down into that a little bit more?

MR. BOLD: Yeah. Well, I'll say as a predicate, I'm not a network engineer, so there are --

MR. BOLIEK: Neither am I.

MR. BOLD: So there are people at Qualcomm that are a heck of a lot smarter than me who may have been -- who should answer that. My understanding though is that they are just different types of challenges, you know, making sure that you've got enough bandwidth and connectivity in a rural market can be every bit as challenging. They are just different technical problems.

You know, and we try to -- what we do in our R&D program is actually a lot of synergy between, not only the government affairs group which I've mentioned, but also kind of sales and business development group. To get out there and provide engineering services to operators around the world; understand what kind of topography they are dealing with, what kind of demographics they are dealing with, and then try to tailor networks to serve them.

You know we -- I talked about the 30 billion in R&D, you know, it's really a reinvestment in the health of the network, and that's obviously in economy that we participate in and benefit from, but we are plowing the money back into it, in a way that we think lifts everybody's belts at the end of that.

MR. BOLIEK: What are the major barriers you face in the United States?

MR. BOLD: Well, it's a good question. I mean, I think on the issue of spectrum, you know, we work very closely with the U.S. government on -- I'll touch more on some of the barriers, I think to innovation in the U.S. You know, the U.S. is the gold

standard. Having been around the world on government affairs in many markets, people speak, you know, in almost hushed, odd terms about how wonderful our system about protection is, and I wonder whether we've taken that for granted, you know, I would (inaudible) that we are always going to have a strong patent system, we are always going to develop a lot of IT in this country, we are always going to have great universities coming up with, you know, the next wonderful idea, and then transferring that into the private sector.

But I've seen a lot of countries catch up. You know, you look at which companies file the most patent applications in our industry right now- Chinese companies. And a lot of that is supported, you know, directly by the state, they've made it a big priority, but it's not at all a given, that the U.S. is going to maintain its leadership, and what we need to do, is really redouble our investments in both basic and applied research, showing both parties, you know, we say the right thing about whether we do it or not, it's out of the question.

And then we have to realize that it's not just the patent system, it's not just protection of patents, it's the preservation of a free and fair market for intellectual property. The fact that companies like ours can make massive billion-dollar bets on really speculative technology that may or may not work out. The reason that we can make those bets, the reason our shareholders, and our Board of Directors gives us the rope with which to do that, it's because there's a market where we can recoup that investment. We can license that technology out to the rest of the industry.

And there's an equilibrium that exists between the sellers of technology and the buyers of technology, and unfortunately that equilibrium is being tinkered with by the Congress, and it seems like a near annual basis by various regulatory bodies, not only here, but around the world. And we have to be really, really careful before we make

wholesale changes in a system that's the envy of the rest of the world.

MR. BOLIEK: So what sort of changes do you fear?

MR. BOLD: Well, as I said, there's an equilibrium between inventors, innovators, and the folks who licenses that technology from inventors. A lot of the proposals, you know, so-called patent reform that we've seen really tilt that equilibrium very much in the direction of licensees, and we think would limit the rights of inventors to get a fair shake -- or a fair share -- a fair, you know, return on the investment that they've made.

And so we've been very active working with the Congress and the administration on these issues but, you know, things like limiting the damages that a company could get if their patents are infringed upon. You know, we take the long view here. You know, Qualcomm was founded in 1985, it was six university professors, six academics against, you know -- in a living room in La Jolla, came up with an idea for, you know, a revolutionary company that today employs 30,000 people. Does 24 billion in sales, and is really, you know, we think developed some terribly important technology for all of us.

They never would have got that company off the ground if they didn't have both protection for their patents, and a free and fair market with which to license that technology. The patent reforms that have been suggested in the past couple of congresses, if those had been law in 1985 I don't think Qualcomm would ever happen.

MR. BOLIEK: So you don't fear the patent troll?

MR. BOLD: Well, I think the first question is, what is the patent troll?

Okay?

MR. BOLD: You know, the patent troll is a --

MR. BOLIEK: I guess it depends.

MR. BOLD: It's you know, it's a slogan, it's a cliché. There are things you can do to get out bad actors in the system, and in fact there is legislation we supported last year to get at this notion of demand letters going into users of various, you know, Wi-Fi and other technology. They are very targeted things that can and probably should be done to rein that in but, you know, we tell policymakers they should be very careful before making wholesale comprehensive changes to the patent system to get out this so called problem. And we also, frankly, would love to see some evidence, if the patent troll issues are a real problem, a real drag on the economy.

MR. BOLIEK: I always -- I always, kind of, root for the underdog. I love stories about invention. Dr. Jacobs has got a great one, and sometimes what I feel like is that some of these companies that don't support the -- that don't feel so much for the underdog, maybe because now they are the overdog, are trying to pull up the ladder behind them, so that, you know, in some ways it's like, you know, they actually stifle innovation instead of encouraging it.

MR. BOLD: I think there is -- there is some of that but, you know, in terms of pulling up a ladder, I mean, we've been very successful, our technology is driving the phones of the folks in this room, and the phones of the folks on the webcast, but we believe passionately they shouldn't pull up the ladder, because we are interested in the health of the overall mobile ecosystem, and the next great idea may not come from Qualcomm.

It may come from a small startup here in the United States, some other country around the world, and that invention will, you know, make that company very profitable probably, but it will also add to the overall experience and it will help everyone else.

But if I could just amplify a little bit, it's not just pulling up the ladder; I

think there are a lot of companies that just have very different business models. They are product companies, they look at intellectual property simply as an input cost, like any other input costs, and they want to limit, you know, the cost that they have to pay to get access to it. They are not doing a lot of, you know, direct innovation.

They are making products, making those products more effective, it's a very useful thing to do, but at the end of the day, I think what this country cares about is inventing things; inventing new platforms, inventing new technologies and moving the dial in a meaningful way; not just selling products, not just selling services.

MR. BOLIEK: America has always been a technological country, I like to think about, you know, they invented their own form of democracy, they went on to invent, you know -- obviously we don't have a stranglehold on invention, but it just seems like the United States, we feel like we can invent our way out of every problem, and that if we face a problem -- and that if we come up against a problem, there is a way that we can figure out a way to invent ourselves around the problem.

That's kind of a global statement, I don't think -- any answers to that. Let me see if there are any questions out there, you know, shoot.

MR. ALTMAN: I'm just wondering, some -- I'm Phil Altman. Some of the regulations I can bet, that are going to be passed, are going to be detrimental. Are there measures in place that will rapidly identify what the problems -- what problems are caused by the regulations so that one can step back when necessary?

MR. BOLIEK: Are you just talking whack 'em all regulations, bam, regulations, bam. Or do you have an overarching view?

MR. BOLD: The short answer is no. There's not such a system. No. We, there's a lot that companies like ours try to do, and it's not just us, it's all sorts of companies in the industry, who try to sort of proactively give governance around the

world, particularly, you know, emerging regions, where they might not have the sort of regulatory framework that you do in Western Europe, or East Asia or the United States.

To say, look, this is how you, you know, essentially build the regulatory infrastructure. You know, one of the things you mentioned, auctions, you know, there are some actually big countries around the world that still don't auction spectrum. Japan doesn't have the legal authority to auction spectrum, which blows my mind every time I say it. And that stifles, you know, innovation, investment, technology, diversity, a bunch of stuff.

So when a country is just sort of setting things up, we try to work with them no matter where they are, to ensure that they've got the right type of framework, because we are also interested, you know, very much in economies of scale. Right? If you even look at the African continent, it doesn't really do our companies any good if Nigeria has one system, Ghana has got another system, and West Africa has five different regulatory regimes, and they are using different bands of spectrum, well, that's going to make it very difficult for us to develop products that can address that entire market. So, there's a lot of work that happens at the frontend.

MR. BOLIEK: You mentioned the -- and I keep going back to auctions because obviously it's on my mind, covering the FCC and one of the questions that the Commission is dealing with, is that you know, in the wireless infrastructure here, we basically have four players. Verizon and AT&T are dominant; Sprint and T-Mobile are always trying to play this game of catch up. What if Verizon and AT&T are able to buy all the spectrum, is that harm innovation?

MR. BOLD: Well, yeah, it's going to -- You are trying to get me to talk about this auction (inaudible) --

MR. BOLIEK: No. No. No. I'm not trying to get you to talk about this

particular auction. I'm just thinking auctions in general. We are going to have an auction eventually, probably, the broadcast spectrum coming up with 600 megahertz, that's low-band auction, that stuff goes a long way. It penetrates walls, it's highly desirable, the current auction, the way it's explained to me, that spectrum is not quite as -- is not quite as good. It's good for other things, but I'm just trying to talk about it in general because --

MR. BOLD: Yeah. So it's just that --

MR. BOLIEK: -- it's a question for both of the auctions, and whatever other auctions they have.

MR. BOLD: Well, you know, I'll actually pivot a little bit and talk about -- because I think your question is about market concentration. And I'll talk a little bit about Latin America which is, you know, an interesting region for us and one that's, you know, frankly not developed quite as quickly as we would have hoped, with a couple of exceptions, and I'll explain the relationships of those exceptions.

So, in a lot of countries in Latin America you have too big operators, it's almost like a duopoly type situation. And regulators have not, you know, been particularly strong in combating those operators and, you know, frankly mobile broadband penetration is not where it should be, even though in some very developed in Latin American countries.

One exception is Brazil. Brazil has done extraordinarily well. They've welcomed investment into the country; Telecom Italia is one of the major investors in the Brazilian wireless market. They also had some demographic changes, you know, the creation of the middleclass overnight, during the Lula, and now Rouseff administrations, and the takeoff of smartphone ownership has just, you know, gone through the roof.

What's really interesting in Latin America is in Mexico now, in the Peña Nieto administration, they have really beefed up their -- they created an entirely new

telecommunication regulator. They gave him like, I think, eight-year terms, office, it's the highest-paid public official, I think, in Mexico beneath the President and his Cabinet. So they want, basically, to have the strongest possible regulator to be able to steer the market.

So when you have more of a balance, I mean, I think the Mexican market is going to see new players come in, and are going to see more investments. So there's got to be a balance I think. You know, while saying that, you know, the companies rolling out these networks, this is, you know, billion-dollar; billion, billion, billion-dollar stuff. You need the incentives in place so they can make those bets, roll out the infrastructure, it doesn't happen by magic.

So the question is how do you -- how do you achieve that balance? And in developing markets it's still very much an open question.

MR. BOLIEK: Questions? Yes, sir, the gentleman here with the red scarf?

MR. HELM: My name is Virgil Helm. Could you comment; I mean as the world shifts toward mobile technologies, and certainly the ecosystem is going that way. Could you comment a little bit on cyber security and the vulnerabilities there, but in particular what sort of regulatory environment; if wishes were horses, would you like to see? And what do you need in the U.S. market in terms of regulation? What would like to see?

MR. BOLIEK: On cyber security?

MR. HELM: Yes. On cyber security, not auction. This is the security issue.

MR. BOLD: So we've been engaged on that topic, although not quite as much as some of the other players in the industry, because we are not a network



infrastructure player, we are obviously not an operator that services either. You know, it probably won't surprise you to say that I think we need a balance between; you know, the very real concerns about security and a relatively light touch.

You know, cyber security is linked very closely to the question of Internet governance, and I think there are some countries around the world that are -- that could potentially use the issue of cyber security to do a bunch of other things that would not have much benefit for the ecosystem. And it's related, you know, not only to national governance of the Internet, what content do you let into your country, but things like local content standards.

We are dealing with an issue and I keep going back to Indonesia, I don't know why. But in Indonesia where they are trying to push local content as a requirement on mobile systems and, you know, their objective here is to try to develop a content industry in Indonesia, it's very -- a very laudable goal. But there are other ways to skin that cat than putting restrictions in place.

So, it's very much coming together now, and we are starting to get involved in a number of forums around the world that are discussing these issues but, you know, I think we'll see what the answer is, and crucially, whether we can get some degree of consensus between the big players around the world, and I think that's -- that would be ideal, but right now I think that might be a long shot.

SPEAKER: Do you think they will (inaudible)?

MR. BOLD: Yeah, and we've -- Well I think they are trying to show leadership and we are certainly supportive of that, and we have been -- again, we are not -- you know, on the infrastructure side, and not on the services side, but we are trying to participate in those forums more aggressively.

MR. BOLIEK: A bunch of other hands -- people that -- Let's start at the

back and go forward. We'll start with this lady here with the --

MS. ROBYN: Hi. Dorothy Robyn. There's been a lot of focus on getting the federal government to free up spectrum, and a lot of it on the Department of Defense, because they are the biggest spectrum user in the federal government. But DoD is also a major innovator, maybe the greatest engine of technological innovation ever created. I think some of the technologies that Qualcomm was built on, came out of DoD.

Do you have the sense that today the Department of Defense is an innovator in this area? Do you work with DoD? Are they -- are they doing enough in that area?

MR. BOLD: Thank you, Dorothy. Great question. The short answer is yes, to both. We do view them as an innovator, and we view them as a partner in innovation. As you note, quite correctly, there has been in the past, technology transfer from DoD, other federally-funded research to companies like Qualcomm, things like Push Chat came out, you know, federally-funded investment programs.

When I talk about funding for applied research, I'm very much talking about the need to support those sorts of activities. With respect to the -- you know, the question on spectrum, that's actually a very good example of the partnership I mentioned earlier on in the talk, between R&D-intensive companies like Qualcomm and governments when it comes to freeing up spectrum and getting services out.

So we actually developed a new regulatory paradigm that we called -- we call authorized shared access, because we realized that there are essentially three blocks to spectrum that we have to utilize around the world. There's licensed spectrum, which is always the most preferable, and it's free from interference, quality of service and the like.

There is unlicensed spectrum. That's something we also develop

products and technologies for, but then there's a third category of encumbered spectrum that's not used on a 24/7 basis. And some of the DoD spectrum you mentioned is a good example of that, and even better example is the 2.3 gigahertz band in Europe.

So 2.3 gigahertz, for those of you who don't know, spectrum, it's a band that's being used for mobile broadband particularly in the Asia Pacific, but really it's going to be one of the really important worldwide bands. In Europe it's occupied by ministries of defense. They don't use it on a 24/7 basis, and they don't use in the entire geographic region of their country.

So in a place like -- in France it might be utilized in Paris, it might be utilized on the coast, maybe in Marseilles and Lyon, but in most of the country it's completely unused, but it's licensed nationally. So the regulatory paradigm we came up with is the way that the phone, using very simple technology, can sense, you know, is the network being used, and if it's not being used, you basically capture that as surplus bandwidth that can be used by commercial operators.

So that's technology we developed. It's a regulatory paradigm that we sort of came up with, first in Europe, but now we are working it in the United States, but it requires a partnership with the spectrum holder, DoD, with the Commission, with other interested players. But if we can do those sorts of things, we are going to get to the 1000x goal of, you know, greatly increasing the capacity, so that everybody can watch, you know, Grumpy Cat on the phone, and all the other videos that people can --

MR. BOLIEK: I love Grumpy Cat. There's been an idea floated a couple times. The first time I heard it was the FCC Commissioner Jessica Rosenworcel, mentioned it, that somehow you can incentivize, you can actually pay the incumbent, the DoD. I mean, you know, you see all this big money that auctions are generating, and if I'm in the -- if I'm a spectrum manager at the DoD, I'm going, why can't I get me some?

Is that -- you know, do you think that legislation like that would be helpful?

MR. BOLD: Well, we are mostly focused on, you know, as I said, developing the technology, putting it out there. I mean, how various governments throughout the world deal, you know, the relationship between stakeholders and sellers is going to be different in every market. We are just trying to create the tools at Qualcomm and offer them up and say, look, here's a way for you to get out your spectrum crunch problem in a very elegant way. Without clearing new blocks to spectrum necessarily, just what you have.

MR. BOLIEK: Will we ever get out of the spectrum crunch?

MR. BOLD: Well, I hope not. (Laughter) Well, you know, it's interesting you say that, I joke about Grumpy Cat, but the types of services I mentioned in response to your first question, really only scratched the surface of what's coming. You know, the irony of talking about the mobile economy is that, you know, everybody has got a phone, everybody uses it for data, we are all very comfortable with that notion, but we really have only scratched the surface on opening up these vertical markets.

I talk about health care, you know, the notion that you'll have sensors on your body that can read, you know, various vital statistics, get them to you in a real-time basis, monitor health conditions. That's going to require some type of spectrum, right? It's going to communicate; education, only now taking off in some parts of the world; interestingly not the United States, but more outside the United States.

The automotive sector, you know, some of our big customers now are car companies, which was not the case three or four years ago. Cars that not only, you know, provide information services for the driver and passengers, but can actually communicate with each other for collision avoidance, for traffic management; can communicate with pedestrians to produce the likelihood of accidents involving them.

So when these -- all these vertical markets start to take off, and Qualcomm is doing a lot to try to see to the development of those markets; smart home is another one, then you are going to see, you know, an explosion of demand within spectrum. There's going to be different types of spectrum. You know, at the end of the day though the phone, your device is going to be, you know, the remote control that essentially, you know, captures all this information and allows you, the user, to see it, to manipulate it, to use it as you see fit; all that is going to take a lot more spectrum.

So it's almost like running to catch up, but the reason that we made the 1000x challenge was, we knew this day was coming, and we thought it was worth investing, you know, literally billion of dollars to solve.

MR. BOLIEK: I saw an advertisement last night about a thermostat, getting your house, a little smart thermostat. I live in 102-year-old house, and I'm going, how the heck is that going to work? (Laughter) Are there other questions? Yes, sir?

SPEAKER: I'm Malcolm (Inaudible)

MR. BOLIEK: Hi, Malcolm.

SPEAKER: (Inaudible) your experience with Qualcomm, you know, looking back from the inception, I'd like you to comment on how you've seen the regulatory environment both here and abroad, evolving? And within the United States, you know, it's a very dynamic environment in so many spaces; in telecom, and in spectrum, and then I trust the Internet, Internet governance, the Internet regulation. And also comment on how the deliberations in the United States are influencing regulatory actions abroad.

MR. BOLD: That's a big question. So, I'll talk a little bit about regulation of the industry first, and then go into IP which I think is very interesting. On the regulation of the industry, when I first came to Qualcomm, a long time ago, you know, we were just

moving from second generation into third generation. Most people's phones were, you know, voice and text devices, those little Nokia candy bar phones that everybody used to have.

And back then it was sort of technology holy war, it was the folks who support GSM on one side, there was Qualcomm supporting CDMA with our partners on the other, and the fights that governments had was over -- over what technology to choose, right. You chose one band of spectrum for GSM, and another band of spectrum for CDMA. We've gone beyond that, obviously. We now have, you know, chip sets that go into phones that work with any technology, virtually any band, you know, we've solved that through Moore's Law and other advances within the company.

So now, really the question is, how do you cover the uncovered? How do you get at this rule coverage problem? And how do you, essentially, make yourself the most attractive option for investment. When you look at Africa, for example, you know, what's Nigeria doing versus Kenya to try to attract investment? Those are really interesting discussions, and the governments are taking very different approaches.

The Kenyan Government wants to set up a wholesale wireless operator and provide services essentially in the South. Nigeria hasn't quite done that, so that's more of the competition. It's no longer a holy war; it's no longer to worry about what technology you choose. I mean, a key front, you know, sadly, there's been I think a real push to devalue intellectual property around the world.

It's a little bit when I mentioned the companies that just have a different business model, and inventor business models, and they want to limit their input costs. There are some developing countries that, you know, still have the attitude that they are buyers of intellectual property, they are not going to be sellers. Despite what's happening, the fact that, you know, China is now leading in patents applications.

And there's a lot of, you know, debate in the U.S. and Europe, almost at the sort of the theoretical and academic level, about the so-called patent troll problem, about you know this notion of patent hold up. You know, a lot of academics get paid a lot of money to think and write these pieces, but there's no evidence. There's nothing on the ground to suggest there's a big problem in the wireless industry.

To the contrary people are falling all over themselves to invest in this industry, you know, the phone has advanced just so tremendously, even over the past five years, from what it was to what it is today. The core technology of the networks has gotten better. This is, you know, the very picture of a healthy industry, and why people want to change the intellectual property rules to correct a problem that doesn't exist, should be a mystery to policymakers.

And unfortunately I think that discussion very much influences developing countries around the world. We've had, you know, papers written by U.S. academics, comments from European regulatory officials repeated back to us in developing countries. They have a lot of influence, and the question is, is that influence used for, you know, the type of model we have here and we've benefitted from? Or, does it, you know, essentially stimulate around a change that would be very detrimental to American inventors.

MR. BOLIEK: One of the things you said earlier, it just seems fascinating to me because I was looking for my phone I guess, in my coat; that, you know, for so many of us, this is third appendage, right. You know, we are crossing the street; oh, my, god, you know; or on the subway, you know, we constantly work on our phones --

MR. BOLD: We have the technology for that, if a car is about to hit you, we will communicate to you, so you'll be fine.

MR. BOLIEK: Well they, just -- because, you know, I'm an American and I haven't traveled around the world very much. It's just -- to me it's fascinating to think that there's -- most of the world isn't like us. That most of the world isn't glued to their phone, but it obviously will stimulate those economies once that gets -- and somebody is just like; be more like us. Is this the thing?

MR. BOLD: Well, I don't think it's be more like us, I think usage patterns are actually interestingly very different around the world. You know, in the Philippines, one of the most important and most-used application is an application that facilitates, easily facilitates remittances of money from the United States back to the Philippines, right, because it's a huge Diaspora community, particularly in San Diego, but throughout the country.

That's a big source of GDP for that country. Facebook is really popular some places, it's not popular in other places. So it differs from market to market. But I'll tell you, I've seen -- I'll give you an example, in India, when the tsunami hit South East Asia, a lot of people forgot that it also devastated Sri Lanka and the Southeastern Coast of India, a state called Tamil Nadu.

And our Wireless Reach Group got involved after that, because what was happening is the fishermen were no longer willing to go out on their boats, and their boats are like dinghies at best, some of them are just rafts, and they basically cast nets into the ocean to catch fish and bring them back. And then the women, their wives clean the fish on the beach and sell them -- basically haul them to market to sell.

Well, they were worried, justifiably, for their safety. There was no tsunami warning system in place, so we financed the development of an application which we called fisherman phone, which had the tsunami warning. Had information from the central -- their equivalent of NOAH in New Delhi that sent them weather information.



Sent them information about the waves, how high they were, the temperature, and also, crucially, what the price of fish was at the market that their wives had to haul the fish to.

You know, the stuff is pretty basic, and this was an area of India that didn't really have third generation coverage. So we also worked with the operator in question and said, could you just build out your network a little bit, cover this part of the beach front. And you know, sure enough within a month they were back in the ocean with more information. They were fishing more efficiently.

Those are folks who never really use a phone before, if they did it was through text or what have you. They are glued to their phone now, but it's a very different set of activities. So, it's going to differ. If you build the infrastructure, build the application platforms, you know, every country will take off in a different way, but they will all be glued to their phone for something.

MR. BOLIEK: Question? Yes, sir.

SPEAKER: So you mentioned that most patent applications are done by Chinese companies. So can you tell us a little bit about how you see the presence of Chinese competitors in less developed countries, like Africa, and Latin America or Asia?

MR. BOLD: So, the Chinese infrastructure and handset vendors, not merely Huawei, but also ZTE and some other companies, have been very aggressive and very successful in penetrating particularly Sub-Saharan Africa, and also Latin America to a little bit lower extent. And you know, a lot of that is, you know, it kind of comes in the form of aid from the Chinese Government when they -- you know, do major trade or economic deals with the countries in question.

And they've done a lot. They've poured a lot of investments into these regions, and done a lot to improve the state of mobile telecommunications. We partner with them in many of these -- in many of these regions. Other activities in Africa are

mostly focused on operators, trying to counsel the operators on how best to serve. You have some very challenging populations, in terms of topography, in terms of the distance between communities.

So we try to provide engineering services as part of our partnerships with them to solve those problems. And then we do a lot of work directly with governments in Africa, trying to inform, you know. We basically made the point to them that if Africa would just work together, you know, as opposed to regionally, East Africa versus West Africa versus the southern states.

If they would just combine forces and get one plan for spectrum, one plan for regulatory management, I mean that's a massive -- that's a billion person addressable market; and they could start to have a lot more influence internationally. And I'm very glad to say that that is what's happened, there's now a degree of cooperation in Africa that wasn't really present five years ago.

MR. BOLIEK: Is there a danger to the United States for all these Chinese patent applications?

MR. BOLD: No. We think -- we think competition -- I mean, look, we are a company that has benefited from, you know, market system, competition between various players. It's just, you know, from the perspective of a technology innovator it makes us get up a little bit earlier, work a little bit harder to stay ahead.

You know, Qualcomm has always been looking at least five years in the future; usually 10 or 15 years in the future. We are not -- we do make chips for phones, but we are not really a product company in that sense, we are not making phones for sale, we are not making network equipment, which makes us very different from a Huawei, or Nokia or an Ericsson.

So we are looking at core technologies, enabling technologies, we are

looking at how the network is going to evolve over time, so we have a slightly, I think, different focus than a lot of these other companies, but we welcome competition in whatever form it takes.

MR. BOLIEK: All right. I think that's got us. Thank you so much, and thank everyone for coming out, and attending.

MR. BOLD: Thank you. (Applause)

MR. BOLIEK: I would shake your hand, but I have that cold thing. Oops, I'm tangled up.

MR. BOLD: I'm tangled up too.

MR. WEST: Okay. So thank you, Brooks; and thank you, Bill, for sharing your thoughts with us. Our second panel is going to explore the global mobile ecosystem. And we have two experts who are going to share some of their thoughts on these topics.

So, Sanjay Puri is the founder and president of the Alliance for U.S. India Business Alliance, and he has worked in a number of different aspects of mobile technology. He helped to form a congressional taskforce on U.S. India investment and trade relations, which comprise several members of Congress. He speaks frequently on U.S.-India relations and the political impact of the Indian-American community. He also is the Chairman of the U.S.-India Political Action Committee, which is an independent bipartisan, political action committee.

Kishor Nagula is senior manager at Caribou Digital. He has spent nearly 10 years of professional experience advising private companies, NGOs and government clients in the telecom sector. Previously he worked in the United States Agency for International Development, and he joined the digital development team where he worked on helping to expand to digital excess across the agency's target countries.

So, I'm going to start with Sanjay. So I know you are very knowledgeable about India, and the mobile and telecommunications sector there. What are the opportunities that you are seeing in the mobile space?

MR. PURI: We were discussing before I came in, in the green room, it's a great time to be an entrepreneur in India when, you know, you have a company called Flipkart, which is the Amazon equivalent, which has a market cap of \$10 billion. And I'm sure some of the old Indian business companies have been around for 100 years and they were a market cap of \$8 billion, or wondering; what the hell did we do wrong?

So I think the mobile technology devices and the growth of Internet penetration and ecommerce has really done a lot, and I think the focus has really been on the online shopping things of that nature, but when you look at India, you know, 70 percent of the economy still resides in the rural area. It has changed a lot of things out there, because today the farmer can know; what is the price of my crop, by going on a smart phone.

Because in India, you know, this device is their computer, I mean, that's all they have. People are not -- I don't see too many people sitting on their desktop using computers. So you can know what your price is, you can plan based on weather information that is coming to you, so I would say the opportunity is obviously people are talking about ecommerce, which has, you know, again, opportunities in the rural areas.

Rural areas are not ones where the fancy malls are coming up so if -- and are very successful, wealthy people in the rural areas, the tier two cities as they call them in India, or tier three cities; they can acquire an iPhone or stuff like that from ecommerce site. So I would say the opportunities are amazing because you have a demographic of a population, 70 percent people below the age of 35, and mobile adoption is just exploding.

And now finances, private equity money is coming in now, obviously the downside of it is, you've got too much -- they say good money chasing bad deals now. Because they've fought it so much and we've seen this movie play out here in the United States, so you will see some bad investment, and people will start going to pull back.

But I would say, target the tier-two, tier-three, target mobile payments. I think agribusinesses, I think the opportunities are just across the board, and taking some of the models we built in the United States, localize it, because if in India people still have way less adoption of credit cards, so it's basically cash on delivery. So those kinds of opportunities have really popped up.

MR. WEST: Okay. Kishor, you advise a number of different players in the digital world. What are the opportunities that you are seeing?

MR. NAGULA: Much to what Sanjay had said, the opportunities are fantastic, phenomenal and profound; we can look at it from a very sector perspective, that, from agriculture you have an opportunity to connect the farmers to agricultural information, weather information.

From health you have the opportunity to connect all kinds of different services to those that are more (inaudible) services, the first time to connect and provide checking, savings opportunities. And for the first time you can actually build a credit force. That's a demographic that's been marginalized.

So that's one -- that's kind of an approach to look at it when it's a sector base. But when we take a step back, what's particularly fascinating is that we look at it in totality. What we are building essentially is a digital economy. And so for the first time you are now starting to have a new viable economy based off what the services provided off the mobile phone; quite profound and exciting, to say the least.

MR. WEST: Well, each of you had talked about some of the

opportunities. What are the barriers to innovation that each of you are seeing? Sanjay?

MR. PURI: You know, and obviously, infrastructure is still a big challenge. I mean, Kishor and I were talking about that, still, you know, at best in India right now, it's 3G, they are looking at a 4G adoption that is happening; ecommerce delivery is a big challenge out there. And also ecommerce penetration, Internet penetration is still about 15 percent. So I think those are the challenges but you can look at the upside too.

If the internet penetration grows as -- at a speed of 4G, 4G LTE it's going to come up. I think it's really going to explode out there, and I think the mindset where people are hesitant to use credit cards, because firstly, you know, 10 percent of the population has credit cards. So they are hesitant, and when you do cash on delivery, it really adds a big cost to the supplier, and people are going to refuse delivery. So I think those are some of the challenges that are happening.

MR. NAGULA: I would say that, again, very similar to what Sanjay had said, that some of the barriers are very much in line with infrastructure, so the towers and the extent to which they can provide connectivity is always a (inaudible), the price of handsets, so now for building a digital economy a very much app economy. It's going to run off of high data usage.

3G is in markets I'm not particularly familiar with, Africa, 3G is only about 15 percent penetration, so it's not necessarily reaching that particularly market. Now I'm moving beyond just the infrastructure, there is also concerns about the principal drivers of the digitally (inaudible) a perspective, it's small businesses and entrepreneurs. As an entrepreneur there's a handful of issues that they have when trying to provide a service, and create a business into this (inaudible).

Roughly there's a couple that comes to mind. One is actually having the

technical skills and the business acumen to be able to provide the services and the (inaudible). Number two, its access to capital, that before starting up a business see capital as extremely hard to come by, and from reports that some of my colleagues have written, the hardest -- the biggest challenge for them is being able to acquire the capital to start a business. In fact, generally entrepreneurs generally attract the capital from family and friends.

And then the third is, as it is right now the mobile network operator is the primary facilitator of the digital economy and so with them being sort of the hegemony for creating this economy, there's a great deal of bureaucracy that they have to deal with, a great deal of lack of transparency. And then just being able to negotiate what the mobile (inaudible) being a huge challenge for the (inaudible).

MR. WEST: So, the new Prime Minister in India recently attracted a lot of attention for various types of reforms that he has proposed, but one in particular emphasizes financial inclusion and the need to include people who currently lack access to a traditional financial services. So I'm curious how you see him being able to navigate the bureaucracy, the regulatory restrictions that now make it difficult to -- for people other than the banks, to handle financial transactions. How do you see that initiative going?

MR. PURI: Well, you know, it has started what is called in India the Jan Dhan Yojana, which means having a bank account for every family, and they have signed up, which is what amazes me, and that can happen in India, or countries like China, that they have signed and I think for some 70 million new bank accounts.

So, you know, the idea is that savings rate in India is one of the highest in the world. Instead of putting money in your mattresses, et cetera, put them in the bank, you earn interest, you use that for transactions. Liquidity helps the country finance infrastructure, et cetera, but I think that's what he, this Prime Minister in this -- it's really

important to note, he is the most -- probably the digitally savvy leader that India has had.

And, you know, he's got one of the largest Twitter followings. He communicates with the country through Twitter, social media, et cetera, and his push really is digital. As Kishor talked about the digital economy, everything he says has got to go online, and for that to happen, penetration has to happen. So in terms of financial inclusion, as you talked about, these bank accounts are all going to be operated through smart phones.

The smart phone adoption is growing dramatically because it's gotten cheaper. Whether it's through imported handsets, local handsets, there are a lot of opportunities that's happening there.

MR. NAGULA: So I'm finally (inaudible) as an expert on financial inclusion, but what I can see is the Prime Minister being able to charge, given his position, and making substantive influence on can come across in three different processes. I think one is being able to put in the regulatory environment, so that the bank and telecom operators can work with another and cooperate. Previous markets it's generally a telecom-led model which can sometimes (inaudible) bank accounts and with the banking model, so if they can work with collaboration, they can definitely push things ahead.

What's also particular excited with having no -- degenerating push the charge, is that he can actually drive, and make the infrastructure changes, to allow and facilitate the mobile network operators, to be able to provide and have the bandwidth to support the transactions that happen, their savings are -- that they can -- so that consumers can save, but more importantly, and what's particularly exciting about financial inclusion, it's not only just the savings component, but it's one -- financial inclusion is tacked on to another particular service.



So in markets that we've seen, that what's really exciting is one, financial inclusion or financial payments, digital payments is latched on to a particular service. So it's items like pay-as-you-go solar lanterns, pay-as-you-go lighting can now be enabled. So as a principal driver of demand, could then necessarily facilitate a driver for the Prime Minister to sort of take his stance as the Head of State to be able to push the regulatory environment too.

MR. WEST: Each of you had mentioned several different kinds of barriers to innovation, so we've talked a little bit about infrastructure issues. We talked about the policy and regulatory environment. We know the cost of devices, and the cost of telecommunications connections can be a barrier. What do you think would be the best steps to overcome some of those barriers?

MR. PURI: You know, in terms of best steps to on some of these barriers, you know, as he said, Kishor, said, you know, that has to really be a push from the top. In India with Modi coming in, that has started, really emphasizing that decisions need to get made. You know, they have a problem with having FDI in retail. Well, the smart entrepreneur has found out that maybe they don't have a barrier on online retail, so you got every retail and private equity firms now, pushing money into online retail.

But they don't sell products, they've created a marketplace. So, you know, entrepreneurs have -- it's like Alibaba, Amazon runs the marketplace out there in India. So you have these small entrepreneurs who put on their store fronts on there. So I think leadership from the policymakers is important, entrepreneurship in India, and probably in some of these countries; you know, failure is not an option. It's very embarrassing thing for an entrepreneur to fail, but I think with money now coming in, failures are going to happen because so much money is flowing into their incubators of starting up there.

So entrepreneurship needs to thrive, failures need to be accepted, and I think those things, and then a push on infrastructure; infrastructure is really where the Prime Minister is putting a lot of effort on, where, you know, the telecom infrastructure, the roads, sports, et cetera; because ecommerce to (inaudible), really that needs to happen, it can't just be people on motorcycles dropping stuff off because that -- that can only go on for so long.

MR. NAGULA: So I would say that one of the biggest considerations and impediments to innovation lies with what the mobile network operators are (inaudible). They tend to be the person and entity that allows and facilitates -- of entrepreneurs to be able to create applications for consumers to use, but I think what's particularly exciting, and maybe to pivot off of the limitation thinking about an opportunity, is that for the first time, we are now able to see a viable alternative to the mobile network operator.

And now we are starting to see the growth of Wi-Fi as an enabler, as an opportunity to connect to consumers independent of the network operator. So with that being -- with access to Wi-Fi, now starting to grow at a rate comparable to that of 3G, we are now starting to be able to see opportunities for entrepreneurs to be able to provide a service without dealing with much of the headaches that come with working directly with (inaudible).

MR. WEST: How is India handling intellectual property issues particularly as it relates to the mobile sector?

MR. PURI: Intellectual property has been a controversial issue, and not specifically related to mobile because they've had a battle going on, or I would say -- well, let's not say battle, they would -- disagreement of opinion with the United States on the pharmaceutical intellectual property issue. But on mobile, you know, they've had an

issue with the payment gateway, PayPal doesn't exist in India. I mean, they are not allowed to function in India.

And with Uber, which is right in a big controversy in India, you know, their payment gateway is very, very different where they put these -- you've got to put money into those cards in India, and only then can you use that. So I think the new government is really beginning to understand that they really need to get with the program, in terms of intellectual property if they want to continue to attract FDI investments in turn, which this Prime Minister wants to do.

MR. NAGULA: Intellectual property is a huge concern where it relates to privacy issues for the consumer, as it relates to, again, building up this digital economy. When we are in emerging markets one of the big issues that market analysts cite, it's the Rule of Law, and so with the Rule of Law being expugnable in various markets, it's very challenging for consumers who want to be able to log on to the digital economy but at same time to ensure that their information is confidential and private.

And so I don't have a great answer in terms of what is the solution, but that is huge concern, particularly as this economy is growing. Being in the states, and as what Sanjay had mentioned is that, even in the states, even in the western markets intellectual property lived as it relates to app-based companies, which is extremely challenging.

Uber is able sort of dominate the market, and be able to withhold all of their privacy information, but as an appropriate counterpart to that is that you have a strong government that can act on behalf of the consumer. In emerging markets that strong government is lost. And so in order for, I think, the digital economy to thrive is that you need a stronger government as it relates to protecting the rights of the consumer.

MR. WEST: Listen, Uber just banned in Delhi?

MR. PURI: I was talking about -- that it was a strong government so they've been banned in Dehli-- could be in other cities, too. It's a thing it's playing off right now, in a big way.

MR. WEST: So, I know; China has been very successful and following a manufacturing strategy and, you know, obviously they make a lot of telecom and technology and the mobile products. How do you see -- and then China would also have been very successful at attracting foreign direct investment; do you see India following the Chinese strategy? Is India trying to develop its own approach to economic development? How do you see the comparison in the contrast with India and China?

MR. PURI: You know, the Prime Minister has a make in India, a strategy where he's really emphasizing manufacturing. I mean he's -- he was here about three months ago, and the key thing that he was asking was manufacturers to come to India. In the sense he said that India wants to be a manufacturing hub, but for that to happen, there are several things that need to happen. They need to reform the Land Act, because it's still pretty complicated because in order to set up manufacturing you want to have that.

And they have to reform the labor laws; which, again, is in the process. So India can compete on high-end manufacturing and they are going to do their own thing, vis-à-vis it won't be replicating what China has because of the challenges they have with the labor laws. They have a pretty strong union base, and also the land issue that exists, but on high-end manufacturing that's where India wants to play, whether it's in chip sets, in telecom units, et cetera.

And I think they are starting to see success because the Japanese have come in and, you know, the Prime Minister went to Japan, they are coming in now in a big way because obviously there's -- they are considering the risk profile of their

investments in China and want to move some of that to India.

MR. NAGULA: I think the best way I can answer that question is where it comes to investments into emerging markets as it relates to, again, building a digital plan. India versus China, I think has very much an all-hands-on-deck, ready-to-go approach as it comes to investments in emerging markets. Their position is less on, what's the state of rule of law is, and what the business opportunity is. India is much like most of the Western market has, it's a little tentative of moving into the (inaudible).

Now we are starting to see, as the previous speaker had mentioned, that you are starting to see a flood of Chinese-based products moving into parts of Africa; much because they are not afraid of trying to generate business.

MR. WEST: Okay. Why don't we open the floor to questions from you, so if you have a question just raise your hand and we will get a microphone over to you? In the very back there's a question.

MS. IRVING: Thank you. Jacqueline Irving, I'm with U.S. Treasury, Senior Economist focusing on financial inclusion issues. So I understand, you know, that there have been -- there's been a huge increase in accounts opened in India, you mentioned 70 million in a very short period of time. But what do you think regulators need to do and what can the private sector do to prevent those accounts lying dormant, to actually get them to advance financial inclusion?

And of course that's happened in the past, where there was a large increase in accounts opened, but they were not -- they didn't actually lead to a very big increase in savings.

MR. PURI: I talked about the account opening; I didn't talk about how many are actually being used. But I think you've hit the nail on the head, and I think that's what they are doing. Is they are now -- he's really got his Chief Minister's -- the

governors -- equivalent of governors and states, and that's what they did, was to really push out, and he's also pushing his party to talk about actually people using their accounts, because I think from what some of the numbers are, that three-fourths of those accounts have zero balances in there, which is obviously not where they want to go.

But the push now is to really get people to actually use those accounts and not just have them as a symbol, and the Party is making a push, the Chief Ministers are making a push. It really is going to come in where there is awareness, there's education. What they've done is, he's given 100,000 rupees as an insurance cover; if you open an account you automatically get 100,000, and now they are also pushing some debit cards, et cetera.

So the goal is to give some enticement so that people continue to really use them, and continue to engage with them. But remember, putting money under mattresses or holding onto to it within different ways, has been going on for decades and it's going to take a little while, but I think they've got a little bit of a good start, if they continue giving some incentives to people, I think there could be an opportunity for them.

(Audio skip, pause)

MR. WEST: That question was how to change the mindset.

MR. PURI: Well the mindset, again, is going to change with the next generation of people, because you've got to understand, the older demographic is the one that's been putting money under the mattress, so the younger generation, their kids are looking at spending that money; so as we all -- if any of us have kids, probably can relate to that too, in any country in the world. So I think that's where the mind shift is happening, and watching TV, seeing opportunities to buy stuff. All these ecommerce sites are advertising, you can buy this cheap, you can buy that cheap.

Well, you kind of have to have a credit card, you are going to have to

have a bank account. You can't keep forking out cash ultimately. So I think that's what's going to happen, the change in demographics, the new generation, that's what's going to happen.

MR. NAGULA: If I may just piggy-back on that. I think what would be necessary, in order for financial inclusion to take off, is that the providers, if it's being a telecom-led market, need to engage in aggressive marketing campaigns that are very much contextualized in the demographic that we are trying to (inaudible).

And then they need to really engage in the education components, so that for the first consumers who are using a smart phone for the first time had absolutely no idea how to use it. So first up, I think, thinking about the user experience and how a consumer might actually use the smart phone in order to engage in, is probably step one in order to figure out, (a) what is that we are trying to achieve? How then will we be able to achieve it, and what are our goals?

And then -- so I think that will probably, at least, generate the interest behind it, and then sort of -- if that is able to succeed I think it's then -- then allowing the telecom markets to move as a primary driver of financial inclusion. In that being telecom-led, allows it to grow at a much faster rate than if it was to be bank-led. So I think if you engage in static reforms being based on marketing, education and user experience to understand the consumer, to drive the marketing campaign, you'll generate interest in the static term. And the thing about it in the long-term, I think having mobile network operators being the primary facilitator for it, might actually be advantageous.

MR. WEST: Other questions? The microphone is coming up behind you.

SPEAKER: My name is Lee Yong. I appreciated the presentations, because mobile tech is very important, very essential for consumers, for business, for

company and for government, but there's a technology that's innovation they are always -  
- whether it's abused and misused, and there is security problem. Like governments  
surveillance or record, or the store, and hacking, and everything. So is there any  
information that you can address; some kind of studies that will tell you how much loss,  
economically, about this damage by abuse and the misuse? And how -- what percentage  
are done by the government agencies, and by the hacking industries?

MR. NAGULA: You know, I don't have a direct answer to that, I don't  
have numbers to be able to substantiate what I'll say, but what I will argue at this point is  
that in these particular markets, so I'm thinking less West, more in the emerging markets  
for telecom, and the app world is that this is very (inaudible). And so when it comes to  
hacking my hypothesis is that it isn't as fervent as perhaps it is in the West, and as it is  
(inaudible).

But in order to prevent and curb some of that, I think what's important is  
that the telecoms retain some of their -- some of their licensing. The telecom market is  
extremely aggressive in order to retain their confidentialities, so if they are able to sustain  
that, that's one sort of way to thwart potential hacking. And then two, is then -- is the role  
and the strength of the government, and that the government needs to be able to  
defending in a pursuit of the consumer's rights, in order to be able to find a viable way to  
secure what a consumer might go through as potential hackees.

MR. WEST: So each of you mentioned the mobile payment area, and  
also ecommerce as sectors that have really taken off, so I'm just curious, what allows  
those sectors to take off, and what have been the barriers to the other sectors that have  
not yet taken off to the same steps?

MR. PURI: You know, the ecommerce sector, obviously has taken off  
because, you know, the young demographic figure that these guys are selling products



below their cost price, and just being very frank with you, these guys are selling goods below their cost price. So I was just talking to some of the retail folks, footfalls in malls have dropped by 20 percent, I mean, which is shocking because that's a big number. So some of these sales are being subsidized because what people are hoping is that they'll lure these customers in there.

And at least I can tell you, in India they are value shoppers, they'll shop, they'll check, they'll compare shop, and maybe they'll -- finally they'll end up at the mall but they will do a lot a lot of checking around. So they are saving a lot of time, they are saving a lot of money, so I think that's part of what has really helped. And then the largest number of products that are being bought are basically technology products; and it's being bought by people who are technologically savvy.

So that's kind of what has helped with the young generation of people wanting to buy these new smart phones, these televisions, et cetera. And as far as mobile payments is concerned, you know, that was something that had to happen. I have to tell you, I'm very impressed with some of the things that are happening in -- you know, I have a bank account in India, and I can do practically way more things on my smart phone there than I can do here, because they kind of jumped from a -- like they say, from the, you know, landlines to the mobile technology.

So a lot of the things that they are offering have gone straight, these private banks, to us. So I think that those are some of the reasons why that happen. I don't know what you think.

MR. NAGULA: So, with mobile payments in the past 5 to 10 years, we've gone from 50 or so different deployments to almost 200 deployments. And I think one of the reasons why that took was the success of M-Pesa. M-Pesa was primary -- M-Pesa being the mobile base payment in Kenya provided by Safaricom. A lot of theories

as to why that took off; one that I particularly subscribed to was that in addition to having the proper infrastructure, in addition to having the monopoly being a primary driver of this new idea, was that there was violence going on in 2007 for the Kenyan elections.

And so when people were getting robbed from their homes with the cash they stored underneath their mattresses, when the alternative was to continue and see what will happen if they left their money in their mattresses given all the violence, or they can try out this new, creative, innovative solution of trying to put money into savings account. Well, of course they are going to try something new. They are going to try to protect their money, and then once they realize that they could actually basically protect their money, I think that sort of ensured that this actually has some viability, that this is actually a sensible product.

So that's why I think mobile payments have been able to succeed in certain markets. In other markets they have not been able to succeed because I don't think they did -- The mobile network operator was perhaps not able to understand the consumer needs and to be able to market their particular product so it meets what the consumers want, as well as what the consumers understand.

As it relates to other sectors, so health and agriculture I think there's a new -- there are several different reasons why those may not have succeeded or has taken off as quickly as mobile-based payments. I would argue that it's a much more time-intensive process when you are starting to push agriculture information and health information as an extremely challenging one to make it profitable.

And it's a market that, it's hard to define why the consumer should pay for it. With agriculture it's more trying to -- it's incentivizing the individual consumer to see the value of what they are trying to buy, and with what they are trying to buy, so let's say we are providing agricultural-based content on the smart phone, well now we've just now

introduced a couple of the variables that makes it extremely challenging for that particular product to take off.

One, you need a smart phone. Two, you need to ensure that the consumer knows how to use the smart phone. Three we have issues of connectivity, and four we have issues of data. So these four components make it extremely challenging for all these alternative interventions to take off, because it's costly and it takes a lot of data.

MR. WEST: Other questions? Over here in the aisle?

MR. ALTMAN: I am Fred Altman. And worldwide, and I presume in India too, there is a move of the population to cities, and I was wondering, how does the mobile technology contribute or hinder this movement?

MR. PURI: In India there's a big movement towards cities; we just have to go to some of the cities to see that there is a big movement. You know, the perception is that only city people use mobile technology, and I have to tell you, because I just came back from India and I traveled too for some work, to the smaller, more remote parts of India, and things are changing dramatically out there.

In India there's -- I would say there are about 100 million people who work in ancillary jobs, whether they could be security guards, they could be help at home, et cetera, they are all onto mobile technology now. I mean, it is shocking to me that -- you know, whether it is travel, whether it is connecting back to their villages or things of that nature.

So I think urbanization is a fact of India. This Prime Minister has talked about creating 100 new smart cities, because the current cities just cannot handle the shift, 40 percent of people are expected to move to the cities, but I think if they create the smart cities, there is a digital economy as he talked about, maybe the stress would not be as much on these big cities. I don't know. Do you have any perspective on that?

MR. NAGULA: The only thought that I can offer is that, if I understand the question, is that it fit the girth of mobile tech and how it's being able to connect. You are starting to see a growth moving towards the big (inaudible) perhaps as a function of that. And I would say that -- I would answer in two different parts. I would say, one is that perhaps that migration into the cities is as it relates to the digital economy, is that -- and you are starting to see the potential of entrepreneurs being able to meet the market, understand the market as it relates to the big city.

And in addition to that, it's access to capital. It's easier to find capital in the bigger city versus (inaudible). But when we talk about penetration rates, I would argue that it's quite strong in the rural areas. A bit of an anecdote, I was doing a case interview back when I was consulting in Uganda, and we were interviewing rural farmers, and it was almost impossible to get the farmers to stand still and answer the questions, because they kept getting phone calls.

And so that goes to show just how strong the strength of signal is in some of these markets, so that you are starting to see that though there is a migration, it's for different reasons, not necessarily relating to the degree of connectivity.

MR. WEST: You mentioned this proposal for new smart cities, what does he have in mind, what's he trying to do and how would that unfold?

MR. PURI: Well, it really gets to what his point was, that there's a lot of pressure right now. If you go to a city like Mumbai, or you go to a city like Delhi, or Bangalore, et cetera, they have kind of reach the edge of what they can handle and, you know, the migration that continues and continues. So what he has in mind is to create clusters and they listed out 100 cities, you take these tier two cities and really provide them state-of-the-art. What his, you know, ideal city would be in Singapore, and there -- consult, they basically signed an agreement with Singapore, which is providing them

expertise in terms of creating some of these smart cities. And also China has signed an MOU with them.

In terms of creating planned cities with state-of-the-art infrastructure, especially from a telecommunications, from a technology, et cetera, so that people don't have to continuously move to these 8, 10 big cities, which really don't have the capacity. Whether it's in Chennai, whether it's in Bombay, they just don't have the capacity anymore.

MR. WEST: Other questions? So in our last session Bill Bold mentioned that there are some places that are imposing local content requirements, either on mobile operators or on the digital ecosystem in general. And I think he mentioned Indonesia as a place that had mentioned this. Are you seeing this as something that's becoming more prevalent in other places? Is this taking place in India? Are there other countries in that part of the world?

MR. NAGULA: So with local content, it is a facilitator to drive consumers to start using their smart hone for alternative services. It is a way for consumers to now see the value of their phone, be it smart or not being smart or featured, to extend beyond just a standard mobile bit -- the standard talking on the phone and as (inaudible). Digital content is a huge driver that can be very much from a top-down perspective, so based on what the government is pushing.

So eGovernment services is now being available online which, mobile being the primary use for how people get online, as well as from bottom-up which is now an opportunity for consumers who want to be able to publish their own content, can now have an opportunity to write and to be able to publish, to be able to provide an understanding of what the local community is about.

So local content, digital content is a primary facilitator and driver for

people to get online, and to actually see the use of both the content, but more importantly, what the Internet can provide.

MR. WEST: Sanjay?

MR. PURI: You know, in India, just a little bit of a different segue from local content. When you go from one part of India to another part of India, it's almost like going from one country to another country because the language, the culture, the systems, et cetera, are so very different. So when you -- you talked about the challenges or the opportunities for some of these companies, they really have to keep that in mind because what plays in the north of India does not, from a language, culture, even buying habits is so dramatically different.

Where if you got to Gujarat, is very different than when you got Punjab. Or you go to Bombay versus you go to Chennai. So I think you really have to be sensitive in India about, that even though mobile is a unifying force, but localization within that area is also an important part.

MR. WEST: So you mentioned government services, how much progress has -- or have governments in India made in configuring their services for mobile devices in particular?

MR. PURI: Well, you know, it depends on which parts of -- you know, the reason this Prime Minister won in a big way, was what he did in his -- when he was the Chief Minister or the Governor of his state, of Gujarat. Gujarat has put its land records online, it's put a lot of its services online, and now the government -- some of these governments are much more progressive.

When you look at Madhya Pradesh and Chhattisgarh, et cetera, but each government, each state is trying to do its own thing. The central government now, with the federal government now, with him coming in has a real directive that put everything,

even environmental clearances are going online, because environmental clearances can hold up your business for a couple of years.

Now he says, you've got to make a decision in 30 days, and you get your clearances upfront, because the big thing that they are trying to do is make India a much easier place to do business. I mean, his goal is that currently it's 140 in terms of ease of doing business; he wants to bring it down to 50 in the next few years. So digital is his way of doing it.

MR. WEST: Okay. We are going to make that the benediction on this event, but we thank you very much for coming out. I want to thank Sanjay and Kishor for sharing your thoughts as well. Thank you very much.

MR. NAGULA: Thank you. (Applause)

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