

Company Name: Samsung Electronics
Company Ticker: 005930 KS
Date: 2015-06-03
Event Description: Investors Forum

Market Cap: 188.10TRI
Current PX: 1277000
YTD Change(\$): -50000
YTD Change(%): -3.768

Bloomberg Estimates - EPS
Current Quarter: 40870.816
Current Year: 152068.973
Bloomberg Estimates - Sales
Current Quarter: 53829509.861
Current Year: 213489616.000

Investors Forum

Company Participants

- Robert M. Yi
- Injong Rhee
- Alex Hawkinson
- Daniel Lee

MANAGEMENT DISCUSSION SECTION

Robert M. Yi

I think it's time to get going on today's event. My name is Robert Yi. I'm on the investor relations at Samsung Electronics. I think I know most of you, but maybe still there are some that I haven't met yet. I need to say hello to those who I've not met in the past till today.

We have a pretty exciting event today. Back in – it's already three months ago, almost, when I gave a speech on the first quarter closing. I identified six major areas that I was very excited about and company was very excited going into 2015 and beyond. And we have a very solid presentation today covering some of those areas.

If you probably don't remember this, but in my conference call speech, I have mentioned five items. One was DDR4 and second was Vertical NAND Flash. The third was the – our 14-nano FinFET technology. The fourth was flexible display and the fifth being Samsung Pay.

Clearly, today, we're going to talk about Vertical NAND and Samsung Pay. We spoke of the 14-nano FinFET and flexible display back in November last year in New York. We'll probably do something this fall on DDR4. I think it will be in Singapore, but I'm not sure which location we have selected to run the second half Investors Day.

And one more thing that we will present to you today is the Internet of Things covering very – what I consider as a practical step toward what I feel was very – just a concept in Asia when I heard the term IoT last year. So, hopefully, today we'll be able to give you very core of what we think will be very important growth areas or the areas that will help Samsung Electronics to grow mostly in 2016 and beyond. I think some of these things that I would try to bring to these events are not something that affects this quarter or next quarter, but things that will affect Samsung Electronics in two years, three years, four years down the road.

I think we also have great speakers today, very – I think unique and interesting collection of speakers. First, we have Dr. Injong Rhee. When I first saw him, I thought he was a doctor of music, but he's doctor of computer science. He's going to give you his input on the Samsung Pay. I think it's very exciting software platform that Samsung Electronics and smartphone business, that's what it needs for the future.

Second, we have Mr. Alex Hawkins (sic) [Hawkinson]. He's the President of SmartThings, which is the enterprise that we bought last year, to venture into IoT in more of a home network environment to start. He's been in the industry more than 15 years, so I think there'd be a lot of things that he will share with us.

And third, we have Dr. Daniel Lee; he's the Vice President of Memory Division. He will go over the flexible display – flexible – Vertical NAND business that we are very excited about especially the 48 layer products that we planned to launch in late this year.

Okay. Well, two years ago, we had this event on the largest scale using the whole Dynasty Hall next building. That's when we were making a lot of money with a lot of budget. Since then our budget was cut in half so we have to cut the room in half and make this very cozy event. I trust that you guys will be nice to your neighbors and watch your manner

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so that we tried to survive next four hours in the least unconformable way, okay.

And when these three events – speeches are done, I'll come back with a very brief wrap up. And I have one announcement that I wanted to make, so if you want to hear my announcement I suggest you stick around, okay.

So without further ado, I'll introduce Dr. Rhee to the podium. You want to give him a big hand. Thank you.

Injong Rhee

Welcome to our Investor Relations Forum. I'm not here to play music, so, all right. I was – well, I was invited to last year's IR event in Hong Kong; you'll probably remember me from there. And since then I got invited to about three or four Investor Relations interview and presentations and things like that.

And in fact I work for the Enterprise Business team. I run global B2B sales and R&D. So I don't really work for IR division. But some reason they keep inviting me to the IR event. And I found out today why that's the case. My initial is IR, that's so. Unless I change my name, you'll probably seeing me more.

So there's a URL here, and we're going to do this a little bit more interactive today instead of – because you'll be tortured under four hours of presentation. Let's go back to that. So this URL – go to this URL. And there, you can actually post any questions you have either anonymously. So it's qa-system.samsung [indiscernible] (07:02), right. So instead of having a Twitter, this is more of our own, more of a secure site that we can actually keep it to ourself.

And so, let's go to that site. Thank you. Now, if you go to the site there in the right, if you click on the right, and click above right. Right. So then you can actually put a title and then – and put a content, name, and password is any number you want, it doesn't matter. It's four digit or any digit, okay? All right. Let's go to my presentation.

So, right, today, well, I'm going to talk about mobile payment, right? So Samsung Pay is really a mobile payment solution. It's really a new way of making payment using mobile phone. It's a very simple problem, if you just look at it, right. But if you go deeper into it, it becomes much more complicated.

So, I mean, this is a number that we pulled it out from some analysis. It's actually saying by 2015, 47 billion transactions will be done by mobile. This only constitutes less than 2% of total transactions actually happening through credit card. So it's almost credit card transactions altogether is about 300 trillion transactions per year, right.

And so, out of that, mobile payment is actually going to grow like almost double every year number of transactions, right. And lot of these transactions we've had is just online transactions not much offline transactions. And so, last year, we have seen some announcements and the launch of mobile payment products and one is actually through Apple Pay. And up to now, it's reported less than 10% of the iPhone 6 users actually used Apple Pay at least once, right? So that's fairly low adoption rate.

In other places like Korea, we have seen a lot of introductions of a lot of different products like social network service provider launching their mobile payment solutions, banks launching it, and we're only seeing that – and these people actually experience mobile payment is about 12% of users. So it's fairly low adoption rate. So why is that the case, right? So, we actually look at the – what is the most important factors that attract consumers to use overpayment and the three factors that came out as most important one is the security, right? So given there's a multiple instance of the high profile retailers, actually, they were having whose data – customer data being stolen, and that actually strikes really a fear into the heart of the consumers about the security being really important factor.

And the second factor is the, wide acceptance at the point of sales at the merchant. So, point of sale is when you actually, swipe your card and doing all the transactions, right, at the offline stores. And this means that the – is when you actually, have a mobile payment solutions within your phone, and is this store going to accept my mobile payment solution or not, right? So based on that, the wide acceptance is really a critical factor and second one is really easy-to-use and convenience and so forth.

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And we look – we started some of the existing solutions and S is not Samsung Pay, sorry. So, it's Softcard, okay? And then the A is Apple Pay and G is Google Wallet Solutions, right. And then, so, we done the surveys, and what is really the roadblock for this solutions to be adaptive is the biggest roadblock is the wide acceptance at the POS terminal. Why is that the case? So if you look at the existing solutions, right, a lot of – most of these solutions are based on technology called, NFC, Near Field Communication.

But if you look at the merchants that accept the NFC transaction, they need to actually modify their cost terminal. They need to actually have hardware upgrades and software upgrade and so forth, right? And it is known that the – while as of 2014, less than 5% of the merchants actually has NFC capability. And it's also expected for that penetration of this NFC technology to have critical mass, it's going to take about four to five years, just in the U.S, right?

So this actually means that when you try to use your mobile payment solution, you have to mentally think about, oh, am I going to use this solution and can I use this solution with this merchant in this store, right? That fills a mental block for you. So, at some point you got the clock saying, oh, we cannot accept that solution. Then you get, you feel frustrated and embarrassed as well at the same time. Next time, you will think about using it.

And you're so – consumers already feel comfortable using plastics, right? Why do they care about pulling out the mobile phone and educating the clock and all that stuff, right. That becomes a bit of roadblock for accepting this mobile payment solution, right? And so, here is what we provide as a value compared to existing solution. And three, we really strike on that three points – three factors that the consumers really care about when they look at the mobile payment solution. First, we just address this acceptance issue. And second is we address security and then, user experience, okay, very simple user experience. I'm going to talk about these three points very quickly. And then, really, turn the mic to you guys, and then, let you guys ask questions, right.

So, Samsung Pay is based on NFC, that's for sure. But in addition to NFC, we support what we call magnetic secured transmission, magnetic secure – MST, okay? Or some people call it mag-stripe technology or something like that. So if you look at your credit card, there's a mag-stripe, magnetic stripe in the back, right? And typically, you swipe the credit card on the POS terminal, right?

And together with this two – combination of these two technology allow us to have coverage more than 90%, okay. Why is that the case, right? So, in this case, how does it work, right? On an MST, well, if you look at the POS terminal and on the – when you swipe it, and there's magnetic wave, right. And when you swipe it, there is a magnetic reader that read magnetism that's actually embedded into mag-stripe tape. The mag-stripe tape contains information – really binary information, plus, minus, right? And about your credit card number, expiration date, and some of the other information relevant to the credit card, right? That's what's being read when you swipe the credit card.

So what we have done is that on our phone, we put a – here in the back a coil that's more like antenna. When he pass electricity on it, it generates a magnetic signal, magnetic power. It's basically magnetism, okay? But that's what's actually – it's very simple technology. You actually learn from your elementary Physics class, right. You actually had an electricity and you have a magnetism automatically on – with the coils, right. The same technology we put it in. What we have done is that we encode the credit card information, right, into electric signal and that converted into magnetism which can be read by magnetic reader on the POS terminal. So since you actually do the swiping and actually read sequential information, right?

So what we have done is that through using the phone, we're sending this magnetic signals, which is the credit card number in a sequential signal so that the POS terminal then is reading this information as if the actual swipe actually happened. So when you get your phone closer to the POS terminal, right, then you actually get the same effect as the actual mag-stripe in a swipe action. So that way, it actually works with all the – almost all existing POS terminals and by just having that device closer to you – close to the POS terminal. So that's fairly a simple technology. This is actually a technology we acquired through our – the acquisition of a company called LoopPay. Okay, that's – this actually solves our acceptance problem. The next thing you probably wonder is that because you're sending magnetic signals over there, instead of by contact, right? When you actually do the swipe, you're sending it through the contact, right? But you don't do this contact – sending information through the contact anymore. You're actually sending it over air, which means that some people nearby can actually eavesdrop those information, right?

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So, you might think about, oh, is that going to be a security concern, security issues? Right? So, that's the next topic I'm going to cover. It's not – the way we actually solve this problem is that, okay, we solve that last month accessibility, access technology. Now, what we have to do, we have to make sure those transmission actually done through a very secure manner.

So, the way we do it is that we use here a tokenized scheme. We call it tokenization. And so, instead of actually sending token information – sending actual credit card information, we call it PAN, primary account number. Okay, instead of sending that information, we send a one-time PAN number, one-time credit card number. We call that one-time credit number as a token, right? So, this – the one – this token is replenished every time the transaction happens. So, even if there's some hackers actually get that information over the air, they cannot use it anymore because that number you can only use once or in a limited number of times, okay. So that actually really establishes our first line of defense.

Second one, when we are doing that we actually make sure those application called Samsung Pay application is protected by our platform level security solution called Samsung KNOX. And Samsung KNOX is a hardware-based security solution and certified by the U.S. Government for instance, UK and Australia, Finland and many, many government agencies actually looked at our platform solutions and really certified this solution to be secure. In fact, this is actually the only technology approved by the U.S. Government Secret Services. It's not Blackberry or Apple or any other solutions, right? And then that combined with our fingerprint biometric solution. And this actually really protects the security of Samsung Pay services. And I said that our solution is very simple to use. It's actually very simple and one thumb action where screen is off or wherever the screen is. And thumb action will actually bring out the card. You can switch card back and forth depending if you don't want to use a different card, you can use something else. And just the fingerprint authentication, done. Right? And that's the transaction. So let's see how this thing actually works through a video.

So here you see a gentleman that's actually swiping up, get the card, fingerprint authentication.

[Video Presentation] (21:38 – 21:48)

It's so simple, the video clip is very short, okay? Not much to talk about. Very simple to use. And so, now the question is what – is that really enough, right? And while I've said, people are already accustomed to using plastics. It's not so difficult to use. They've been carrying plastics all the time. But the thing is that the – we're not actually just here to replace credit card. We are here to replace your physical wallet into digital wallet.

And so, if you look at your wallet today, how many plastics do you carry? Well, I bet you're going to carry about maybe, at a minimum, two, a couple of credit cards and maybe, now five or – and debit cards, bank card. And then, also, you carry some of the merchant cards, merchant-issued cards, as we call it private label credit cards, PLCC, like a merchant-issued like a Macy Department Store cards and GAP, Target. And they act – work as a credit card, right? And doesn't necessarily actually carry Visa or MasterCard, but are actually accepted at that particular store, right?

And then, membership cards, right? And also, gift cards, right? Lots of coupons and receipts, right? And your wallet becomes very bulky, right? And what we are trying to do is we are trying to replace all of these plastics with mobile phones. And when I think about this, all of these cards are based on mag-stripe. They don't even have EMV chips or have a contactless NFC capability, very simple, low cost, a lot of these things are based on the mag-stripe. Our solution works with all of these, right? Well, why do we really care about this? And not only just reducing the volume of your wallet, we're trying to really create a value for merchants and consumers using this.

Let's have a look at the – how does PLCC, private label card, why that's important, right? If you look at all these high-profile retailers and their – more than 30% of their transactions happening through PLCC. Not your regular issued, bank-based – bank-issued credit card. Why is that? Well, that's because consumers actually get more rewards if they use this store-issued credit card. And also, for the merchants, since they don't have to go through the Visa or MasterCard card networks, right, and their exchange fee is very low. And then also because of this, they know more about the customers and they can maintain customer relations and, actually, really, entice customers into the store more and have more frequent visits, okay? And because of this information they gathered through this credit card use, they

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can actually have much more targeted marketing for the customers.

So, the PLCC is so important. So if mobile payments, mobile phones support PLCC, right, how many in a – just PLCC, then a lot of things actually happen, like you can actually do a lot more personalization. And also, you have experience of carrying like a yard of paper coupons, right? And you don't have to carry a lot of those things you don't – you're not interested in using many times. And what we can do is that, we can actually provide a lot of contextual information, where that actual transaction happened. And then also the merchant having that information, what type of items they buy, they can actually introduce more relevant coupons and offers to the customers at the right time, okay? Not at the time of when they're trying to pay at the register. That's – it's already too late.

When they are coming to the store, when they're actually browsing through some products, that's the time they can introduce coupons and things like that. And it's combination of this will give you much more rich experience of shopping experience and after all, as businesses, we are here to create a better experience for our customers. And that's good for us, that's also good for the merchants and then also consumers actually get their rewards and then gets much more. Their shopping experience becomes much more pleasant.

And this is one – an example. I mean, another easy example about how this, I mean, some of these cards, replacement is important like gift card, right? How many times you actually come to a store and you realize you forgot to bring your gift card. Somebody gave you a gift card and it's just so bulky on your wallet, you left it at home, right, and you've forgotten and never used that \$50 or \$100 gift card, right?

If you can actually put that gift card into mobile phone, you carry your mobile phone all the time, right? And also, I mean I, do exercise, jogging in the morning and I only carry my phone. I don't carry wallet and things like that. So if I can do the payments with this, right, I mean, that's a big plus and do all this like memberships, and all this mental blocks or all this thinking behind what cards should I bring and all those things will be completely eliminated. And it actually really, hopefully, will actually increase adoptions more for the – our solutions, right?

And so since you're the investors, you probably really care about how we're going to make money out of this, right? So – and we can actually allow, we can do customer acquisitions, and credit card activations for the – like the private label cards and even credit cards – bank-issued credit cards. And for credit card activations, we can actually make some money. And the gift card, we can actually allow – introduce certain gift card and consumers can buy the gift card, send their gift cards to other people.

And so, for that purchase, we can actually get the bounty. And also, we can actually – because we know where the customer is based on some beacon information and things like that, we can actually offer much more relevant real-time coupons and offers. And for that, in our coupons that's been actually used by the customers, we can actually get the bounties for that, right? And since we know – we can actually have this contextual information and combined with merchant's transaction information, it actually allow more targeted advertisement services. And for that, we actually make some revenues out of it, right.

So this actually is our wish list. But what we are actually looking at this – is at the – for a successful mobile payment solutions, it requires about a – when – what is the criterion that we're going to use to say, oh, we have very successful mobile payment services. We're looking at about a 15% to 20% of our users, right, with users of phones that is capable of mobile payment using mobile payment solution. That's the time and we're – based on that projection, we're looking at this number of users, not number of transactions, right?

So when the solution is going to be available and it's going to be available – what's the month, it's June, right and probably we're looking at about September timeframe coinciding with our launch of next flagship model, in Korea and U.S. first and then in the Europe, in China and Australia and also South America and those are the major markets we are looking to launch our service, okay.

So I'm going to stop here. I only spent 20 minutes. So I got about 40 minutes for questions. If you have questions. So, can you bring up that bulletin board? See if you guys are – how techie you guys are, see if – if I don't get any questions there, then that proves something, either I didn't do any – I did a perfect job of answering all of your questions or you don't know how to use this one.

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Q&A

<A - Injong Rhee>: Yeah. We got one question, okay. Will you license this technology to other handset manufacturer? Will you make money on transaction-by-transaction basis?

So, the – well, the answer for that is that the – initially we'll start off with – we want to make sure that Samsung Pay solution really have market tractions. And then we'll think about opening out to the other manufacturers. And are we going to make money on a transaction-by-transaction basis? And we don't actually – that's not our main source of revenue, okay? Let me put it that way. Any questions?

How sensitive is MST and how does it add on? Okay? Mobile payments. That's not a question. Test three, okay? Where and how does the handset have to be placed next to on top of POS terminal? Okay. So actually, the distance between POS terminal and then the phone is about roughly less than a mile, probably about 5 centimeter, less than that. And they can be where you actually swipe your card and around the rail. That's the...

Any other questions? Am I done? Or you can ask questions verbally if you want?

Yes we do. But, oh, right now what we are looking at is just taking picture of the ID. But going forward, we're looking into like a storing smart card, government issued TIV card and then having actual certificates stored into our either [indiscernible] (33:14) or embedded secure element that we can use that as ID. And so now, if you use that as ID, you can actually use it to open the door or decrypt the e-mail that you get, like, all those smart card – smart ID usage. You can actually do that. Any other questions? Yeah.

<Q>: [Question Inaudible] (33:35 – 33:44)?

<A - Injong Rhee>: We're staying on the mobile side. So our solution doesn't require any change on the POS terminal, hardware or software. None. So, we're not going to go into POS businesses. I mean, we being Samsung Pay, I don't know other division of Samsung. There are so many divisions, I don't know what the plan is. Yeah.

<Q>: How will the revenue recognition play out?

<A - Injong Rhee>: What do you mean by that? Can you elaborate?

<Q>: Sure. In the next few years, when the revenue becomes material, should we expect this revenue item to be included, bundled with hardware or does this show up in...?

<A - Injong Rhee>: Oh, so how are you going to use the revenue – how that contribution is going back to the consumers? Is that what you're saying?

<Q>: No, no. I'm expecting that this mobile payment is going to help you with additional source of revenue.

<A - Injong Rhee>: Device revenue. Device – yes.

<Q>: Right. How will we be able to track this revenue? Where will it show up?

<A - Injong Rhee>: I think that's more of – I'm not in a position to answer your question. But at this one, mobile payment solution is not just for the service revenue that we're going to create, but it actually really help our device sales. And that's the reason why we're doing it. And how we're going to recognize? I think it's recognized by the number of device sales, and then also – but on the books, how is it going to appear? I have no idea, if that's what you're asking.

Let's – before you – I'll see if there's any questions. How confident are you of acceptance by U.S. retailers? Why did you accept the launch in September? So technologically, technology-wise, we don't have any barriers in a sense that the – it just simply works on all the merchants, right? I mean 90% of...

What are the other 10%? That's when – typically, when you go to like a gas station, you have to do – insert your card. It doesn't work with those cases. And – but getting that merchant support and champion really help us promotion, right?

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So, we'll actually work – merchants, actually since we are here to add values, not to replace their existing values, right, by saying, oh, you need to change your POS terminal. Oh, you need to actually have – maybe give up on your CRM system in order to use our system. We're not doing any of those things. We are just saying, okay, just as it is, we'll use your existing infrastructure, we cannot just add value on top of it. It's just really giving the value back to the merchant and increasing their like a more customer relations and customer acquisitions and so forth, it'll actually really help drive them to have more the revenues. And that's merchant acceptance. We don't – so far, we have not seen much of resistance on that front.

<Q>: I think you showed some of the forecast up to 2020, how you'll monetize, how you get bounties for all these things. What kind of value are we talking about for Samsung itself by offering this hardware, for example, in the next five years, next three years? Are you looking at hundreds of million dollars in incremental revenue and what kind of cost offset do you have to develop this project?

<A - Injong Rhee>: So, cost of providing this solution is not much, okay? And is – I think is more of the reason why we're doing this business, is really help our customers, right, and increasing their happiness when they use our device, right? So when – as I said it's – we are here to create a better experience for our customers, right, creating new lifestyle because they've been using plastics and so forth, now, we're like changing their habits, right? And actually, through that habitual change, what we would like to achieve is really more stickiness for our devices when they are coming to us, and when they use our Samsung Galaxy S6 or going forward, and they find it, oh, it's so easy-to-use. And it makes my life a lot better and improve my life. That's what we'd like to gather here, okay?

And about specifics of monetary amount that we're going to make out of this and I can't really comment on that at this point. But it's actually, we're here, we're looking at given that we can make 15% to 20% of customers adopting and using our solutions, that becomes I think, really stickiness. I'll give you one example of stickiness, is that when they actually use our phone for payments and things like that, and we get this revenue, we are going to return soon those revenues back to the customer as a loyalty points.

And then so the loyalty points actually, they can actually go instead of real money, they can use it stored on the Samsung Pay Solution, they can use it in any other store. So, as they use more Samsung Pay, right, they get more points, right. And because they have points on the device, they can use more transactions. They can – when you buy, go to the store buying some more items. These are the easy way to make a payment. And really simple tap and go. Like, use for transportation and things like that, you just tap and go.

So all those transactions will create the membership points, loyalty points. And it actually creates a nice feedback groove. And because that people are using more their coupons on this thing and it really makes the merchants really happy. And they keep using our services to make an offer to the customers, right.

Let's go through some of these questions, if I don't have questions from the floor. Okay. So do you require issuing bank's approval? Yes, we do. So we've been working with many banks, right. So on the – in the U.S. bank, all major U.S. banks. And we already announced Bank of America, Citibank and Chase, U.S. Bank and Capital One and American Express. Did I miss any of them? Right. And then, we work with all the major card networks, American Express and Discovery and MasterCard and Visa.

And so definitely, we need to have – we have to have a lot of technical innovations with them, right, and having that the identification and verification process, and then, all the tokenization services being integrated. And that's we've been busy over last eight months or so working on the solution.

Yeah. It's better here. How would you be able to hold Samsung Pay users to transaction information?

We're not going to hold that transaction information as a server. But at the devices, we actually carry those informations, and we can actually do a lot of intelligence with that. And whether we're going to store that transaction information is actually based on the consent of the users. So that's what we like to do. Right.

Let's go through one at a time from the beginning and see if I can answer some of the questions I like to answer.

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Do the credit card info stored on the phone? Not. On the phone, there's no credit card information stored. It's actually – as I said this is a one-time token information stored. Right. That's replenished through cloud services.

Okay.

Greater value can come from partnering with the online retailer? Yes. Any plan beyond partnering with the offline channels? Yes, we're aggressively partnering with online retailers. And so, is it fair that, right now, a lot of transaction is actually happening on the online side. So we'll get the customer acquisition through the offline transactions and things like that. And that really lead them into having convenience – enjoying the convenience of the online transactions. Right.

Does Samsung Pay work with debit card? Yes. ATM, debit cards, yes. ATM machines, when they actually have to – I have a card in and chip in, then it's not going to work there. Right. But we are working with – especially in Korea we are working with the local banks actually to make it work on the ATM machines.

What percentage of handsets ship next year be Samsung Pay-enabled? Galaxy S6 series, Edge and Galaxy S6 will have this in the next flagship model and then also the other models will aggressively put this system in. So as I said we need to put that hardware component into the device. It's not going to work with the existing devices in the market but it's going to work with the new devices we are introducing in the market.

Does Samsung has to sign a contract with a credit card company? Yes. Banks in order to expand. Yes. We do. But we are working with the card networks to actually consolidate and make that – the contract really simplified. And so we don't have to sign one banks at a time but we're actually seeing a lot of banks are interested in working with, really a few large banks were actually capturing more than lion share of the market that way, okay.

How does this work with chip and PIN [ph] force (44:48) credit cards? Do I enter my PIN after I present the phone? No, you don't have to enter your PIN and your fingerprint is actually used as authentication and that's what it's going to look.

Is the pace of upgrading NFC-enabled [ph] force (44:57) machine is going to meet the expectations by [indiscernible] (45:04) too aggressive? I have no idea but so far it's been proven that actually adoption is fairly slow. But the thing is that the – our solution is going to be there all the time because [ph] mag drive (45:19) is not going to go away, right.

I mean, you're not going to have one flag day – after today, everybody shouldn't use [ph] mag drive (45:27) use different card. You're not going to have that. There is some person like me who is old fashioned and always use [ph] mag drive (45:37) Or you have to travel overseas [ph] mag drive (45:40) so you have to have [ph] mag drive (45:41) capability. So our MSD solution is going to be there to – for a long time. And so it actually nice transition technology but it's also going to be very sustainable technology.

You mentioned an intention to launch in China, well it seems to be with the MII, seems to be pushing for [indiscernible] (46:05) solution with Samsung pay allowed to launch?

Yes, we are in discussion with a lot of stakeholders in China. And you expect to hear from us on China, probably at the end – toward the end of the year.

Okay. Let me – can I take questions from the audience, just for a change? This sounds like one of my lecturing session, when I was a professor before I come to Samsung.

<A - Robert M. Yi>: Hello, just to let you know that if you want, you can ask the question in Korean and that sequential interpretation will be provided in English.

<A - Injong Rhee>: Simultaneous, that's what we meant. Okay, as a user what's the main benefit of using Samsung Pay? So you don't have to carry plastics anymore.

<A - Robert M. Yi>: I don't carry that much plastic to begin with.

<A - Injong Rhee>: Right.

Company Name: Samsung Electronics
 Company Ticker: 005930 KS
 Date: 2015-06-03
 Event Description: Investors Forum

Market Cap: 188.10TRI
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 YTD Change(%): -3.768

Bloomberg Estimates - EPS
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 Current Year: 213489616.000

<A - Robert M. Yi>: Like do I get – like you said earlier you get points, what level of points do you get?

<A - Injong Rhee>: So like a – working with the banks to – when customer use our Samsung Pay, they get more cash backs, and that's what I mean by the point.

<A - Robert M. Yi>: I know. But like – is that 1%? Is that 2%, 3%?

<A - Injong Rhee>: Well, I can't really tell you that. If I tell you, I have to kill you. I'm just – so it's a confidential information but it's more.

<A - Robert M. Yi>: Right. Okay.

<A - Injong Rhee>: You're not going to put that into press. [Foreign Language] (47:47)

<Q>: [Foreign Language] (47:49-47:55)

<A - Injong Rhee>: [Foreign Language] (47:55)

<Q>: [Foreign Language] (47:56-48:16)

<A - Injong Rhee>: Yeah. So the question is that the there could be security issues or did you – did you guys get the questions, interpreters? Right, don't you use the technology?

The question is that if I – that registering the card yourself, you can actually register somebody else's card, right. How that security is going to be enforced, right. And then, the next question – the second question was that the – can you really issue a card directly without actually having users register a card through our mobile pay solutions, right. That's the question.

So first, the question is that the – so we have this process called identification and verification process. So when user – the way we actually do this is take a picture of your credit card, it automatically takes the credit card information. And then, once that is done, and then, it actually has to go through the bank's ID&V process, like they're asking for your addresses, some of your confidential information. And sometimes, if you have some transaction record with us or with Samsung, then we're actually – banks honor that information. And also, sometimes, you need to have to pick up the phone and call the call center, say, and answer few questions, what's your mother's maiden name, and your addresses, and so forth. It's actually regular – just like the same credit card verification process you actually go through, right.

Second question is can you issue a credit card through Samsung Pay instead of actually having the users to read in or register their existing credit card? Yes, we could do that. And we're – that's also what we are – one of the things that we can actually think about is like one of the things that we're trying to do in Korea is that, without actually having the credit card, you can actually bill through carriers, right? Because you, actually, carrier billing system, and so when you – just like you're having a credit card on your device. And then, that's one example, and that's going forward, we'll actually adopt that strategy.

Yes. So what – there's two questions. So the question is are we going to see the payment solutions on wearables? Yes, on our Galaxy Gear and we'll have solutions through tap-and-go like a lot of transportations and things like that will – small payment solutions will – so wait to hear from us probably toward the end of the year, and we'll have that answered. Any questions? Yeah.

<A - Robert M. Yi>: Use your microphones, please.

<Q>: You said the system will be available September 1 in U.S. and Korea. Does it mean if I have a GS6 or Edge, I could walk in to a store and use it or would there be any additional hardware required or software uploaded?

<A - Injong Rhee>: No. So, you don't need any hardware – additional hardware. You just use the phone and put your credit card of the banks that we have partnership with, right, and then, you are good to go on almost all merchants.

<Q>: So September 1 is...

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 Current Year: 213489616.000

<A - Injong Rhee>: Not necessarily September 1. But it's at September, yes. Don't kill me if I'm... Yeah.

<Q>: Okay. You mentioned like a 70 million, the user base, by 2020. I wonder how you come up with 70 million user base, the target user base?

<A - Injong Rhee>: No. That's because based on our projection on our devices that actually have a mobile payment capability, we're looking at a 15% to 20% adoption rate, right? So 15%, 20% of those, our mobile phone customers are using it, that's how the numbers came.

<Q>: So, that means the Samsung Pay could be used just for the high end smartphone, because Samsung is selling 350 million smartphone for a year, 70 million user base...

<A - Injong Rhee>: Definitely not. So it's actually on the new phones that we're introducing will have this capability, and on MSD capability. And for the Samsung Pay, as an application, it can be used in any phones, right? And so, they download the application to do a lot of online payments and if they register card on Samsung Pay, they can use any devices to do online transactions with this, not necessarily just offline transactions. So it's not just for the high end, but it can be used for the, like, lower-end, mid-range devices, but we don't actually count them here. Okay. We just count – just count it as the high-end phone, but that's really – our estimation is not a statement we're going to put this solution into high end only. Okay. But this is just our projection. It's very conservative projection. Just use that as a – with a lot of grain of salt.

Still got 11 minutes. Are you guys bored? I'm getting bored. There's a gentleman back in there who actually raised hand. Yeah. Go ahead.

<Q>: [Foreign Language] (54:11-54:23)

<Q>: Thank you for your presentation. And I heard that Google Pay (sic) [Android Pay] announced that all the Android-based phones will be able to use Google Pay (sic) [Android Pay]. So, I was wondering if Samsung Pay is partnering with Google Pay (sic) [Android Pay] on this.

<A - Injong Rhee>: Yeah. So, in addition to that, I mean, he was asking are we going to be competitor to the Google on this particular service? That's a very pointy question and hard to answer that one without upsetting many people, right? Right. So, yeah, well, it's actually Android Pay, not Google Pay (sic) [Android Pay], right, and that Google Wallet service is – actually Google Wallet service is the – actually their product name Android Pay being really a tokenization of services sitting in the back end and actually allowing all the manufacturers hook into that infrastructure.

So it's really – so will Samsung Pay going to be compatible with the Android Pay? That's a possibility. And so I don't think we are right now in places where we're going to be competing with each other, and what we'd like to have is because we have a unique value to offer to our customers, compared to other existing solutions including Google Wallet.

And so that's why we're actually having initiative with the Samsung Pay with MSD technologies because MSD is a unique offering to our customers. Right? And going forward, we don't have a particular plan on whether we're going to compete or partner.

I mean, just to be clear, we don't want to compete with Google. I mean, Google is our greatest partner, right. And by working with Google, we can actually achieve much more, bigger synergy and provide much increased value. But then again, what I like to say is that Samsung here is – our users we like to provide differentiated value, right.

And we are here compared to other Android manufacturers who are definitely our competitors, right, and we like to provide differentiated and then also a much more appreciated value to our customers. That's what we've been doing in providing this type of differentiation.

Did I upset anybody? No? All right? Okay. Go ahead.

<Q>: My question is how difficult it is for your competitors to introduce the similar service? My question is the entry barrier. What kind of entry barrier you're expecting for your business model?

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 Current Year: 152068.973
 Bloomberg Estimates - Sales
 Current Quarter: 53829509.861
 Current Year: 213489616.000

And second question is, I guess there might be a lot of synergies between your hardware business and this service business. But if you have to choose, you have to choose one, what will benefit you more? I mean, the Galaxy will help Samsung Payment or Samsung Payment will help Galaxy?

<A - Injong Rhee>: So it's going – if I answer the question backwards, yes, it's going to – Samsung Pay is going to help the device. It's not the other way around. And we're here to really drive device sales and to make our device much more convenient and beautiful to use and really provide that type of convenience to our customers.

And that way, we'd actually create a stickiness and drive more device sales. But that again doesn't necessarily mean we're not going to do any service business, service revenues and things like that. I think it's going hand in hand, right? If you do well on the services, right, and it really helps the device sales going forward and also helps the services. So I think it actually really – you cannot give one up over the other, but if you ask me which one has a higher priority, it is the device sales.

And I forgot the first question. I think first question was how – what is the barrier of entry, right? We have lots of patents for this technology, but then again it's not necessary – the only defense against the other competitors actually coming off with a similar solution. But I think it is a fairly significant barriers for them to follow. But what's really – well, I always say this. It's not important to be first in the market, but it's really important to change the lifestyle of our customers and providing really increased, enhanced lifestyle for them. That's what we are trying to achieve.

And so, by revolutionizing the lifestyle, and I think we actually get a lot of customer bases that actually. And so that itself becomes a huge barrier of entry for us, right, and having the customer bases, our customer enjoying them. And so I think, and by itself, we're going to the market fairly quickly compared to other Android manufacturers and also having this huge advantage in terms of technology and acceptance and then security and all this value-added services, I think we can actually create a huge barrier of entry to that.

Five minutes, yeah.

<Q>: Thank you. I think it's a great service for in-shop pay, but can this potentially expand to in-app pay or online pay? That's number one. Number two is if Google ask you to open up MSD technology for Google Pay (sic) [Android Pay] so that Google Pay (sic) [Android Pay] can work fast on the Galaxy phones. That's going to increase the device attractiveness. Will you be open to those kind of offers?

<A - Injong Rhee>: So the first question is that the – is that going to be offered as in-app purchases and online payments? Yes. It's going to. So that's a very simple question to answer. The second question is much tougher. And so, if Google kindly ask us about the MSD, I mean, the way we look at it this is that the Android as our ecosystem, right, it's my personal philosophy, so if I guess – if I – after I answer this even I get fired, I don't know. But my personal philosophy is that the – where the Android ecosystem needs to be much more – I think it's very strong right now, but it's actually – we are here to protect this ecosystem together with Google. And that's where our competitors like Apple Pay, Apple, right, and like iOS and versus Android. It's not about Android versus Android. That's the way – my philosophy. And we – it's always in our company's strategy to work with Google to provide more technology innovations to the ecosystem.

So, one example is the Samsung KNOX. We actually contributed some part of its technology to the Android and that's actually being used by the – or it's actually merged into regular Android versions, and so used by all the manufacturers. So we are here always providing that technical leadership and innovation to the ecosystem. But at the same time, we'd like to maintain the differentiations, right? And that has to – that two requirements have to be balanced before I can really confidently answer that questions.

But at this point, it's clear that the Samsung Pay is the only solution that has MSD, right? So, you have to offer me a job after I work out on this. You asked me two questions. For clarity, I want to give it to other – unless there's other questions. Okay. Go ahead gentleman.

<Q>: Just to summarize, it seems like the MSD technology helps to differentiate, at the beginning you're going to see how the whole experience is going to play out. But when we look into the future, there could be opportunity for

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Current Year: 152068.973
Bloomberg Estimates - Sales
Current Quarter: 53829509.861
Current Year: 213489616.000

additional line of revenue, like a service revenue. But it seems to me that at this juncture it's not clear if you're going to be able to generate additional revenue. You're going to wait to see how it all plays out. But what is the key differentiation for your mobile payment versus Google Pay (sic) [Android Pay] or others is just the MSD, especially given the fact that the installed base would not need to be replaced? Is that a fair way of summarizing everything?

<A - Injong Rhee>: It's very – kind of this common denominator in a way of just clearing basis for our discussions today. So, yes, MSD creates that differentiation, right? And with that MSD, not only does the MSD, but actually our other type of value-added services we're putting on top of it, it creates a leadership. And going forward, with that customer bases we can do a lot of things, I think. But we're not actually particularly looking into making a lot money out of this, but actually we are here to create more stickiness and loyalty around our devices. And in that sense, I think this actually really strikes the right points that we like to pursue in the future.

Injong Rhee

Okay. I'm think I'm done 40 seconds before. Thank you very much.

MANAGEMENT DISCUSSION SECTION

Robert M. Yi

Okay. Thank you, Dr. Rhee. First session finished a bit earlier than schedule, but we will just go on to the next session and having a longer break after this, okay?

Okay. Our next presenter is Mr. Alex Hawkinson, the CEO of SmartThings. Please join me in welcoming Mr. Hawkinson to the stage.

I just saw his face over there.

Alex Hawkinson

Thanks very much. Do you want me to go on to that?

Robert M. Yi

For your...

Alex Hawkinson

Yeah. All right. Okay.

Robert M. Yi

Okay. Again, let's – join me in welcoming Mr. Alex Hawkinson to the stage.

Alex Hawkinson

Okay. Got it. Hello, everyone. Thanks for coming to see us today, and I was excited to make the trip over from the U.S. to talk to you all. So try to keep it in the format, talk for about 30 to 40 minutes, and I'll try to leave time open for

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Bloomberg Estimates - Sales
Current Quarter: 53829509.861
Current Year: 213489616.000

plenty of questions as you have them and we'll walk through this. So I'm Alex Hawkinson; I'm Founder and CEO of SmartThings.

SmartThings was acquired by Samsung in August of last year. So we're about nine months into the integration process now. And I'm going to talk to you both about SmartThings, but also about Smart Home and Internet of Things more broadly.

So in the agenda today, the things I'm going to walk through, I'll talk about the top level opportunity overall for Internet of Things and then Smart Home as a part of that opportunity, I'll walk through a little bit about the importance to Samsung and why I think it really matters, then I'll talk about SmartThings specifically. I don't know how much you have heard or know about our company and the platform and how it works. I'll tell you a little bit about the business. We're beginning to scale, leveraging the size of Samsung in all of the different areas we can collaborate across the business, and tell you a little bit about that in the go-forward road map, so you know what will be coming down the line in this space this year and next year and a little bit about how we see the future.

So at a high level, the Internet of Things, it's a massive market opportunity. And I won't belabor the point with too much of the exact data, because no one knows exactly how big it's going to be, but it very much feels like the third wave of the Internet in general. First wave being, sort of, the information economy, websites being created, and whole new industries being built, and companies such as Google arising out of that; people coming online with broadband connections and smartphones, and the social graph, and the social Web, sort of, is the second phase.

Now these radios to connect everyday devices are becoming so inexpensive that you can really add connectivity to almost anything. And the opportunity there is to go after really massive problems: security, energy management, elder care, and those are just things in the consumer space, connected health and so many others.

So a lot of different estimates on this, the timing feels right now, all the key component technologies are coming into place around it. And as we look forward, we see over the coming years, some of these forecasts, we think they even might be bigger, 50-billion-plus connected devices. Many devices for every human being on the planet just over the course of the next five years or so. So we're at the front end of this growth period now. But again, the enabling technologies are there, and we are seeing the beginning of the knee of the curve, as we'd like to say.

So Samsung obviously has a lot of stake in this new phase, and I'll tell you a little bit about the opportunity as we see it, looking into that. A subset of the Internet of Things as an opportunity is the Smart Home. So what does this – these connecting everyday devices, what are they going to do to influence life inside of every consumer household, whether you rent your home, or you own your home worldwide, we think these are really universal opportunities that will affect every household as – worldwide over time. So it's a very big opportunity.

There's lots of different estimates around it, just looking at the U.S. market, as an example, Smart Home expected to grow to \$22 billion and beyond in that same timeframe by 2020 and a good compounding growth rate. We were at the early adopter phase of just a couple million households in the U.S. over the course of the past couple of years. Now, we're really seeing the growth rate is, sort of, stacking up as these technologies become less expensive, easier to use, and word of mouth occurs as everyone has more and more of your friends and your network has them in their home as well.

So again, it's hard to predict exactly what the specific numbers are going to be out because it is the early phases of the market, but we're confident that this is, sort of, the time period in which that meaningful growth is starting to occur.

So and the influence – the importance to Samsung overall, it's both – it's talking about Smart Home specifically and then IoT more broadly, it's both a big new opportunity where there's many new devices, new products that can be created and I'll show you examples of those, so revenue opportunities that didn't exist before, but also spend some time and look at how it's going to influence the rest of the adoption of technologies in the home.

So it's not just new product opportunities, but we think that somebody that's using a Smart Home is going to be influenced in their future choices for existing devices based on those technologies. So if you purchase SmartThings and you had it in your home, we think that in the future you may be more likely to buy a Samsung appliance, or a TV, or so

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 Current Year: 152068.973
 Bloomberg Estimates - Sales
 Current Quarter: 53829509.861
 Current Year: 213489616.000

on. And so that's why, the stakes are very high right now in the early stages, because it's not just the new product category, but it's also, we think, going to influence many of the existing business lines in really important ways.

So the commitments, even we saw this before joining Samsung, we saw the commitment at the vision level, at the CEO level inside of Samsung to really embracing this Internet of Things and Smart Home opportunity, existing top to bottom inside of the company. And here, this is an example of BK Yoon. I was up on stage with him at CES this year committing to basically all of Samsung's devices becoming connected at Internet of Things and Smart Home devices over the next several years. And we are definitely executing on that now. And I'll tell you more about that.

So it's an essential area of opportunity for Samsung both as a growth opportunity, but also I think it's really critical – it becomes more and more critical to the – within the existing business lines.

So what is it, right, what is it due for you? And I'll try to elucidate on that, and then I'll get into what SmartThings is. So Smart Home technologies today, while they can be used for almost anything, and they will be over time, there's really four key areas that are the top reasons the consumers are buying today, why do they start buying into these – into the Smart Home.

And those buckets of the value propositions are really – the top one is monitoring and security generally across the world. And this is, sort of, answering the question, is everything okay in your home whether you're there or not. Everyone has got a smartphone. I guarantee everyone in this room has got a smartphone with them at all times. You live in a world where everything is connected to you at all times. It's sort of ridiculous that your home is not with you wherever you are as you're travelling and out and about.

And so that basic question is, is everything okay at home, whether you're there or not? It's something that everybody wants to answer. And so the top reason that we see consumer's buying is really on that monitoring and security space, I'd say, as a starting point today.

The second area we see lots of interest in convenience and entertainment. These are not ordered in priorities, but convenience would be things like connected lighting. It's probably the top example. You see companies like Philips and so on enabling your lights to come on automatically when you wake up in the morning, turn themselves off when you leave the home. It's a bit of energy savings, but there's also some nice conveniences there. And then connected audio in entertainment, it's going to flow in video and so on as well that you see. Not just Samsung, but companies like Sonos and so on creating these wonderful experiences, where music and entertainment sort of fills your home and is aware of your presence in it.

Health and wellness, another giant opportunity, easiest way to boil this down is – for all of us, anybody with kids or an elder parent living at home, is it a healthy living environment, are they doing okay, and there's lots of ways to get at that problem.

And then finally, comfort and savings, keeping the home comfortable, but while also saving a lot of money by turning down energy use when you're sleeping, when you left the home automatically. It looks like you can save 20% to 40% of the energy use in a typical home without the consumer even being aware really that that's having, [ph] that's there (01:16:10). They're not changing their lifestyle as a result of that. So these are the big things. You'll start to see the most activity in the marketplace around companies that are building solutions in each of these different areas, and there's of course many more as well. But this is what we're seeing in terms of the top initial use cases for the next couple of years.

So okay, so that's a little bit about IoT, a little bit about Smart Home and Samsung's commitment to it overall. So what is SmartThings as a platform and as a company that Samsung acquired? There's sort of two things that I'd love for you to understand about SmartThings and we'll get into how it works as we walk through the slides here.

The first is, we're trying to make the easiest way for anyone to turn their home into a Smart Home. And so what I mean by that is making it so simple that it's not just for the early adopters or technologists. Everybody has their own example. I'm a pretty early adopter of technology, but my mother-in-law is not. Right? So how do we get it to the point where really anyone can understand and use these things? And I think we're – we've achieved a lot of that in our products already. But continuously, we're working to make it easier, and I think you'll see our product lineup is aimed in that

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 Current Quarter: 53829509.861
 Current Year: 213489616.000

regard to make this accessible to really anyone.

The second is that we realized early on that – and this continues to apply within Samsung that not – no – in a household, you're going to have more than one company's technology and products. It's just every household is a little bit different and you need choice both on the devices that you have running in your home. They're not going to come from just one company like Samsung, but also the apps and services associated with those. So we believe that rather than do this all ourselves, from the beginning, we made SmartThings a wide open platform for the IoT. So we invite developers, device makers, and what we call service providers to come in and build new connected devices, new apps and services that run on top of the platform, and I'll give you examples of those as we dig in.

But today, I'd say, we're with the easiest platform, we're sort of achieving against these very well, and we're certainly the leading open-platform with the most activity, the biggest developer network, the most active innovation happening on top of the SmartThings platform today. And that takes the form of hundreds of connected devices that consumers can buy already that work with SmartThings.

So to give you a little bit of a taste of what it feels like in a real home, I'm going to show you a quick video, and then I'll walk you a bit more into the details of how the product works. So if we could tee up the video

[Video Presentation] (01:19:01-01:20:50)

So it gives you a little bit of a taste. This is really – it seems out there, right? But what's interesting is all the technologies required for this all exist today. And it's not that every user adopts all of these things all at once. And in fact, I'll get into that. But this gives you a sense of the possibilities around the Smart Home where it can be aware of your presence, sort of adjust itself automatically based on your needs, lock up and secure itself when you're away from home, welcome you back, and so on. And so it's really – it's a magical experience for people that adopt these things.

So a little bit about how SmartThings works, and this is a very simplistic example. It can seem very complicated to people from the outside. But there's really just a few moving parts, and I'll walk you through one scenario. And then you can imagine how other scenarios work. We have today a hub that we produce. This is a central device. It's sort of the brains of your Smart Home. You need one inside of a home. It contains all of the different radios and technologies behind the scenes that can interact with all these different types of connecting devices.

So it includes different standards, and I'm happy to answer questions on that, such as Wi-Fi, Bluetooth, ZigBee, Z-Wave and other things. And it sort of just acts as a central control point in the home that you don't have to interact with. But there's been what we call things, which are just connecting devices that know, that can either work directly with the SmartThings hub, in some cases, they work directly with our cloud, but that would have a different purpose. So this is an example of a giant picture of a motion sensor. These things are actually very tiny. They can sense motion in a given room or environment. This is an example of a siren that can play a loud sound or flashes lights.

So connecting things that will tend to connect to the hub. We have a cloud platform. This is where the bulk of the company's intellectual property is and sort of development is. It's sort of a connection point for all of this data and all the apps and services around it and of course the mobile app that you have in your hand. So the way these things basically work is you – I'll talk through it in a second. But let's say a motion event was sent on one of these motion sensors, it sends that little device, sends a signal to the hub. The hub sends that signal up to the cloud and then it makes some decisions; if you're away from home, as an example, turn on the siren in the house as a deterrent to somebody that's entered without you wanting them to be there, and then send you an alert, of course, on your mobile phone.

The same basic construct is basically how all of these different things work. There's hundreds of these devices that can connect with our hub. There's an open developer platform in the cloud that has enabled more than 10,000 developers to create different services that do different things combining the data from these connecting devices and then take all sorts of different actions in these areas of monitoring and security, comfort and savings, convenience and entertainment, health and wellness, and so on. So it's the basics of how it works.

So I'm going to tell you a little bit now about the customer life cycle, what people buy and some of the acts, the trends that we see within that. So we're still in the early stages of this. Consumers definitely – there's a few of them that see

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Company Ticker: 005930 KS
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Event Description: Investors Forum

Market Cap: 188.10TRI
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Bloomberg Estimates - EPS
Current Quarter: 40870.816
Current Year: 152068.973
Bloomberg Estimates - Sales
Current Quarter: 53829509.861
Current Year: 213489616.000

videos like that, and they think I want a Smart Home in total. But most of the time that's not the case. People start by solving very specific problems. They don't come to this imagining that like in my house, that there's going to be 200 connected things, and in an individual household. They think, oh I want to know if there's somebody in my house when they shouldn't be when I'm away from home, or I want to know if my baby is sleeping well. Whatever it might be, they start with a very specific need.

And the top buying point for us initially is monitoring and security. And so on our site and we sell this on various retail points and so on, today, a consumer can buy SmartThings security kit for their home, and that contains a hub and it contains several sensors, all of which can be brought together to sort of give you a simple home monitoring and security system in that block.

So we'll be able to buy that as an example for \$299 this monitoring and security kit. They then download our app and we have sort of an equal number of users on Android and iOS. That guides them through the setup process then of connecting their hub, connecting these things, showing them how to get it all up and running. And on average, consumers take about 15 minutes to do that all by themselves. So we're getting to the point where it's quite simple, at this point to go from opening the box to the point where you're up and running with something solved.

Once you have connected these things, then we have a dashboard in our app that gives you sort of your home at a glance and lets you interact with it from one point, and it's very simple and it's very engaging. So sharing a few stats here but the average household on SmartThings today opens the app four times per day and I guess 16 push notifications from their home per day. And that's an enormous number. That's like more than, I don't know, your Facebook users or Twitter users or other things in here. But it's a very high number for things that people are setting up on their own. We're not automatically doing any of that.

So what that says to us is that people find it engaging. They like to be in this communications with their home when they're out about and so on. So they purchase this kit. They get it set up and running, very quickly, they use it. Then, in the process of using their Smart Home, those four times you're opening it up per day or there's notifications you're getting. That's a lot of impressions where then the consumer there's actually a marketplace that we built into the app itself where they can discover the additional devices that they can connect, they can discover the additional use cases and services and scenarios.

So a very simple example might be you buy this home monitoring kit, you know if your door was opened when you're away from home. Maybe you'd like to be able to lock it automatically when you're away from home. And so you can discover there's all of the major lock manufacturers, from Schlage, from Kwikset, to Yale, and so on are all interconnected with SmartThings already. You can discover those locks right within the app by region, purchase them, and get them up and running.

So through this marketplace, it's really quite remarkable on average household starts with five devices that they're buying in these kits from us today. And within a few months, they're more than doubling that number. They're going and purchasing and leading up to more than 10 connected devices in an average SmartThings household today. And we'll watch those stats very carefully both the initial households but then also how they purchase more devices and services and so on. And this is the way we think about the open platform as well.

So you get up and running with one of these initial solutions because we have more than 10,000 developers adding. There's more than 19,000 device types in the platform now that needs different types of connecting things. There's several hundreds that are commercially available today, but thousands in the pipeline coming from companies that are integrating new products that will connect in new ways in home. That creates a lot of upsell opportunity for consumers on an ongoing basis, once we have them up and running in our app to buy more things.

Similarly, these apps and services, so a service example might be – let's say, in home security I have a connected camera, a very common example is recording services for that camera that we call DVR services, but we're not just seeing a live feed from the camera but when there's motion in your home, getting a recorded clip of that event, so you could go back and see what actually occurred and so on. There's premium services like that that are being built on the platform that will be available at a subscription fee to users as well.

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So this open platform that we've got and all the activity on it creates this ongoing funnel that's incredibly powerful both for the consumers, but it's also amazing for us at Samsung because we can leverage all the data and the insights coming from what consumers – not just what they initially purchased, but this ongoing life cycle, what else they're interested in buying and so on and use that to inform our own product decisions.

So what are the opportunities for making money in all this? And this is – so speaking to Samsung generally, one thing I'll say is we see it as essential that we own that user experience and data interface that we've built within SmartThings because that's what gives you the leaping-off point in order to know what consumers want to purchase and actually put that at their fingertips those initial purchasing opportunities.

But once you have that in place, there's sort of three big areas. One is that you're going to hear a little bit more on the components business in a moment, not all related to this, but in all these connecting devices around the world, there's many components in mobile technologies that need to be delivered against that. And a recent example is Samsung announced the ARTIK module which is for IoT devices overall. It's a little – it's got components, it has all the radios and computing built-in to any device maker that's building a new connecting device, can leverage in building their connected device. And of course, it includes automated connection to the SmartThings platform.

So lots of components, technology, sales opportunities here. Finished devices being like the things that do stuff in your home. So in SmartThings today, we have these very sensors, the hubs and so on. Almost every category that Samsung is in today, there's going to be these beautiful connecting devices in the home and outside of the home that we plan to be the leader in delivering.

Then finally, on the top of the platform, we do have the opportunity for premium services. So not just the one-time sale of the hardware but going in with examples like the DVR or security services and we see hundreds of examples of those being created by third parties today which we'll be able to monetize in an almost app store-like way. So lots of opportunity throughout the chain here that you'll all struggle over time to model in the right way. So we'll be learning about it, sharing data on in the coming years to help you.

So scaling across Samsung. So it's early days for SmartThings, just nine months in now. But we're already collaborating in a lot of ways and see basically the formation process of a cohesive strategy across all Samsung for IoT and Smart Home. Examples that are already occurring that I'm able to share publicly, lots more than this going on, obviously. But in the mobile team, we're looking at unique opportunities to make the Galaxy devices work super well and natively with the Smart Home. How can we create unique experiences on Galaxy devices that just make it a little bit more fluid, a little bit easier for consumers that have a Smart Home.

Digital Appliances, clearly, BK Yoon made that commitment. All of the – every single appliance that Samsung makes that has connectivity in it is connected with the SmartThings platform. And in the coming months, you'll see a lot of those activities in use cases emerging from every appliance category. So all the things that you saw on that video is an example.

With TVs, we're really being thoughtful. We think they have a big role to play in the Smart Home. Both as a way to interface with it, also as a way to leverage the sensors on it when you maybe are away from home in different ways. And then potentially as hub in the future to make it even more transparent to a very big base of users and not have to buy that extra hub component. So lots of Smart Home experiences being integrated with TVs and finally, in areas in the components business looking top to bottom, but this first example being the new ARTIK module which was launched a couple of weeks ago.

So there's more examples on this, but really all in Samsung has been good. SmartThings provides the missing layer in that data connectivity in that user experience platform that everybody inside of Samsung can be driving integrations with, and it's creating these wonderful opportunities.

Final slide, and then I'll open it up wide open for questions. So a little bit about the roadmap in terms of what to expect. 2015, the biggest focus area is the top activity that we're seeing in users that's answering is everything okay in my home. That is the number one use case that we see for Smart Homes worldwide. And so we will be launching in the second half of this year packages that are specific to that with very broad based marketing in a few key markets. So the

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U.S. and then two additional markets that we're not announcing today that will be announced imminently.

2016, we're laying all the groundwork now. It's a lot of hard work, but for very broad international expansion, so the platform – SmartThings and these connected products, you can expect in 2016 to sort of enter all major markets for Samsung very broadly. So it's a key area that we think we could sort of stay ahead of the competition and really leverage Samsung's scale worldwide. And we're putting all the pieces in place for that.

These things are supported in the platform today, but come out with specific packages for these other top-value propositions, where we've seen a lot of consumer interest. So there's convenience in entertainment, health and wellness, comfort and savings.

Beyond the home, as we think that it's essential to win Smart Home now, but about 20% of the developer activity in the platform is actually outside of the home today. So there's already actually thousands of projects that are, in all sorts of various, from small business to lightweight industrial programs, the property management and so on. And so over time and we're sort of giving ourselves time to get into this, but we will begin to formalize programs around SmartThings to enable those other industry segments that are actually outside of the home but trying to nail it on the Smart Home first.

Okay. Well, that's the slide I wanted to walk through. So maybe now, open it up to questions.

Q&A

<A - Robert M. Yi>: Thank you, Mr. Hawkinson. Now, we will have a Q&A session. If you have a question, please raise your hand, then we will deliver the microphone to you, okay? And once again, if you want, you can speak in Korean and the sequential interpretation will be provided. Thank you.

<A - Alex Hawkinson>: I see a couple of hands already.

<Q>: Thanks very much for your presentation. Can you give us a sense of – and this is maybe a tricky question, but just how substantial your R&D budget has changed since Samsung's investment and how you see that changing over the next couple of years.

<A - Alex Hawkinson>: In terms of what it was as SmartThings, it's orders of magnitude higher now. So we've been growing the company very aggressively. I don't know how I could pin down the exact number. So we're up to several hundred folks directly in the business in terms of our engineering staff. But I can say that what's been amazing is seeing Samsung's broader collaboration around the platform beginning to occur. So we see very big examples in each of the major product organizations sort of building an integrated product on top of the platform and so on now. So I think if we're to put a sum total wrapper around R&D, it'd be measured in sort of thousands of people in terms of their activities on the platform internally today. So I think there'd be more specific numbers but treating it as a global opportunity that we want to nail worldwide over the course of the next 18 months. Yeah.

<Q>: Maybe if you could elaborate a little bit on how you're reaching a balance between staying early [indiscernible] (01:37:38) open platform for Smart Homes and now being Samsung for nine months. And in particular for [indiscernible] (01:37:47) let's take iOS as an example, how comfortable are they to give us some access to data for analytics if possible versus maybe having – Samsung having a bit of possibly more privileged access.

<A - Alex Hawkinson>: Yeah. That's a great question. The sort of the top question I had in the in agreeing to the acquisition honestly is whether – we thought this is very important, so the winning platforms will be open in the space for lots of different reasons. It's best for the consumer. But we also actually think it's the place where the most innovation will happen and so on. So I guess I'm pleased to say we sort of – the commitment has been complete and we've seen it diligently sort of maintained internally.

So to give you examples, we have certain principles internally such as Samsung uses the same developer tool that are available for the open developer network, right? And so Samsung, knowing that we're in the family can really embrace those fully as a premium partner. But the same, there's not different tool available to, let's say, the TV organization than there are available to outside third party and so on. So we're trying to maintain those principles of what tools the

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Current Quarter: 53829509.861
Current Year: 213489616.000

outside developers have access to and so on.

We're also – there's sort of a bigger topic which is sort of the terms and conditions in how do you detect the interest of consumers but also have develops, have policies around data access and so on where we've been very, very clear on maintaining those where basically consumer owns their own data as an example of the key principle there. What access does the developer have? Well, limited to the devices that they've done integrations with and the terms and conditions of the apps that they're building on the platform and so on. So, maintaining some of the same standards that are universal but not – there's nothing, there's sort of backdoor that Samsung has provided access to.

All that said, we – even maintaining these things, we really wanted to watch carefully to look at the dynamics of the developer activity that we have. Yeah, that sounds great, but if there would be a big slowdown in the outside developer activity on the platform for some reason, it is not. We've been, sort of, continuing the – we haven't announced the exact steps, but even as of the CES, which was six months into the acquisition, we'd more than doubled the total amount of not just developers registered on the platform, but the amount of monthly activity. So – and that sort of compounding growth rate has continued as well. So we see continued acceleration in the number of new devices, the number of new apps and services being developed on the platform. So I hope that gives you a little bit of – a little bit more perspective, I'm happy to talk about it more, but it's a level of – D&A level of commitment for us.

<Q>: Thank you. I can see on home device kits, how a consumer could potentially install all this stuff themselves. But if a consumer says, I want a Smart Home and you've got dozens, if not hundreds, of light bulbs and everything else, do we need to create a new kind of system integrator level in the tech retail chain that we perhaps haven't had today with these kind of work-out-of-the-box-type devices, for example?

<A - Alex Hawkinson>: Yeah. So the short answer is yes. So there are – there's cases not just when a consumer wants to go all-in in the beginning, which there are more and more of those, right. You see an example in some of these households, and then particularly, when you're buying a new house, or renovating, or something you may be more inclined to, sort of, go all-in. But also, even along the way, it might be as a consumer, I might be comfortable, and this is the case for me, as the CEO, I was comfortable with these little sensors. But when it comes to, like, a door-lock, I basically don't want to mess with that myself, right, or a light switch, or a thermostat, or these other deeper connected devices.

And so even for the incremental sales, in some cases, we think, it's really important to make it easy to have a consumer have access to an installer network, or a supporting partner that could come and deliver it for them. So we're not quite there yet today, but what you should expect to see is that initially partnering activity, where we're looking by market with partners that we can have one click away in the shopping cart almost to be able to, sort of, have that installed, they can come and do it for you, and then we'll evaluate going forward whether that needs to be more of an internal competency or not. But it's definitely important in terms of opening up the true mass market.

There was another question over here.

<Q>: Just a question about the security function. I think it's all nice to have the security like the motion sensors and even the video. But at the end of the day, without a physical presence of actually somebody there to stop it, or a robot dog, or something, like, when the end-users just get frustrated by knowing that somebody is breaking into their house and taking their things and they have to call the police themselves, or whatever, like, so, what is your end solution in terms of that security?

<A - Alex Hawkinson>: Yeah. So there's lots of answers to that. There is actually a lot of benefit of this knowledge. So there's a lot of we call sort of the neighborhood watch, at least. There's something that exists for all of us today that for certain types of incidents, your neighbors, or your family, or friends, or others that are around the home can be notified and actually take action on something. So knowing is a part of it, and being able to take action quickly is very valuable. So we see, sort of, examples every day of consumers that were saved, right, by knowing about something occurring quickly.

That said, there are – using the developer platform, we think there's lots of opportunities for premium services on top, which are monitoring – monitored security will be one example of those where you actually wanted to be call center

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 Current Year: 152068.973
 Bloomberg Estimates - Sales
 Current Quarter: 53829509.861
 Current Year: 213489616.000

certified to call the police on your behalf, or something like that where there will be those offerings available on the platform by multiple third parties in different markets, and lots of co-activity opportunities in the future around it.

<Q>: Obviously, right now, a lot of these services are like a B2C. Is there a kind of more B2B kind of solutions that you're thinking about?

<A - Alex Hawkinson>: There are – as I – sort of alluding to that 20% of projects on the platform being outside of the home. We do see a lot of opportunity in services for small businesses, services for commercial property management and so on and so forth. We're just beginning to – honestly, those are happening because it's an open platform without us doing anything at this point. We're looking at those very carefully and deciding which of those phases should we proactively invest in.

But I'll elucidate for one more second on this. As I said, it's really not one size fits all when you get into this extended services market. Some people live in a place where there's never break-ins. And it's not monitoring for security incidents that are actually the issue for them. It might be, you have an elder living in home and it's health-related; it might be, you have little kids and they didn't get off the bus, didn't come home on time, and you actually want to notify the parents of their friends and the neighborhood and so on. So we see a lot of this innovation around the services space that is going to be very interesting to watch over the coming years. And then as we see certain examples that take off, we can, of course, go in and own those or invest more heavily ourselves. Question?

<Q>: Hi. One question for me. Hi.

<A - Alex Hawkinson>: Hey.

<Q>: From a strategic perspective, what seems to be quite complicated is that this is a service business where Samsung Electronics has been known as a great manufacturing company. And what kind of challenges do you think it will take to, sort of, modify the business model from manufacturing to one that's very service-oriented, or actually focused on the customer of one. It seems to me that it's actually going to be a bit more difficult because of the company's heritage.

<A - Alex Hawkinson>: I think it's incremental rather than – so on – and that it's – nobody knows the answers perfectly on this stuff. But it really feels incremental where you're still leveraging the depth of manufacturing device-making capacity in the company, and a lot of the groups that are building connected devices can still just do exactly that, right. They can make a lot of money by just selling the connected versions of these things that are going to exist in the home. And it's not that every single team needs to have an entire services model around each of their products. They can emerge from a different part of the organization. So when I say it's incremental effect, you don't need to add those competencies to every single team across the entire Samsung Group.

So in terms of dealing with us, that's part of the way we've organized today. We kept SmartThings independent. We are building the cloud and user experience platform for the company. We are developing – maintaining the developer evangelism, these engagement with outside device makers and service providers to help them with the tools to drive this integration. We are organizing the services marketplace. So it's being – developed this specific competency within SmartThings.

And then as we look in specific markets, there are already core layers. I don't know how much of this is public for Samsung, so I'd be a little bit careful here. But in each of the various market subsidiaries, there are also already partnering organizations that have been built to, I'd say, develop content partnerships with software and services companies that are around entertainments and gaming and so on that are in any given market. We're able to leverage some of those capabilities to educate them on the SmartThings platform and say, hey, what's the local – the UK market specific example of a local security service that can be integrated on the platform and leverage those partnering organizations to sort of bring that message out inside of the local geographic market.

So, I don't know if that helps much, but again, we don't need – the whole company doesn't need to change all at once. People need to feel the great quality of devices, these connected versions, we need to have a services platform, which we're delivering. And then we are building the partnering competencies where they make sense in each of the different regions.

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Current Quarter: 53829509.861
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Other questions? Sorry. Anywhere is fine, whoever gets the mic is first.

<Q>: Well, thank you. Well, it looks there's a lot of these IoT platforms [indiscernible] (01:48:34) Google few days ago talked about Google Brillo platform. I hear some of the platforms out there. So another thing, is another open platform. So how all this evolve together? Are they going to be competing platform? Can they grow together? Is there a consumer? Should you be aligned to one platform or the other developers? Third party developers, can they support or should they choose one? Who's getting traction?

<A - Alex Hawkinson>: It's still early phase, so I don't have all the answers perfectly, so I'll talk out loud about that for a second. So I think ultimately what matters that we do think there will be a flywheel effect. What I mean by that is it's self-reinforcing network, where whoever has the biggest consumer base will, by nature, attract more device makers and developers to integrate with their platform that will make more choices available to customers and make a self-reinforcing, sort of, network of effect.

And so that is going to be very important. And that's something we're focused on creating – getting critical mass early, leveraging all Samsung's capabilities around the world and so on. That said, I do think that there's going to be room for multiple platforms. It's not all ruthless competition on one or the other. So in a lot of the cases, many of us – SmartThings is leading the way on this front, like, choosing some of these open standards, where you try to make freedom of choice for the consumer a reality in a lot of case.

Because we think it's – let's say, on the radio standards, if we all made different choices, and a consumer had to go into a store and pick, oh, if I buy that, I'm going to be locked into just the Apple HomeKit or I'm going to be locked into just the SmartThings, or just this Brillo platform, or so on. I think that that would actually create confusion where it would slow down consumer adoption as opposed to if we have these open standards that we agree to, it's less scary to the and you can let the best experience and let the best marketing and product win.

So we are – at least, in our case, we're really focused on fostering any choices that we're making on the technology stack to doing that on non-proprietary standards where it is open, there's multiple chip makers, there's multiple ways that people can develop these devices and so on, and they can work in other controlling platforms, too. So it's almost – it's like a long conversation we could have, but hard to summarize it, there is a race to get to critical mass, because the influence will come on the size of the consumer and developer networks you have overall.

That said, there's not going to be just one winner. There's going to be multiple boats that sort of rise, and I think the ones that will succeed other ones that sort of foster this open-modeling approach. That's just what we're trying to do as well. So happy to talk more privately on that, if you'd like. Yeah?

<Q>: Thanks. I was a little confused post the joint presentation you did at CES with Samsung in January. Samsung was going to have a set of range of Smart Home products or whether everything that Samsung does in Smart Home is now going to be under the SmartThings brands.

<A - Alex Hawkinson>: So there's differences between branding decision and technology decisions. I'd say, generally speaking, SmartThings is the one platform across the company and all of the connecting devices for Samsung that are related to the Smart Home will work through SmartThings. So there won't be any ambiguity with consumers about the app you've used, the experiences that you can expect across the family of products regardless which ones you buy, and nor will there be ambiguity around the developer messages, either. That's one way to integrate new devices, one way to build these ongoing services and so on.

<Q>: So if I'm a consumer now, I know when I buy SmartThings, I'm buying into Samsung basically?

<A - Alex Hawkinson>: Correct. There will be – we're trying to be thoughtful on the branding decisions, and those will be announced in the market shortly. But there's places where the Samsung brand plays very well and it's very strong with consumers and it tends to be with purchasing physical devices at that initial point of sale. We're trying to be mindful of this open-platform question now as well, because if that all is – if it was all just Samsung-branded, as an example in the app or so on, would the consumer believe that they can only buy Samsung devices, which, of course, is not the case. We want them to know that especially in places where Samsung doesn't make a connected devices

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Current Year: 152068.973
Bloomberg Estimates - Sales
Current Quarter: 53829509.861
Current Year: 213489616.000

available today, you want the consumer to have that open choice, so.

<Q>: And if I may, how do you ensure quality control on third-party hardware? I mean, if the consumer is managing their home platform themselves it's got to be absolutely robust and stable.

So how do you manage that?

<A - Alex Hawkinson>: How do you manage the third-party ecosystems? So it's very much like, we're the first to begin to mature on this, because we have the biggest developer network today of this activity. So we've found that we basically need to create a certification program. So the way it works today is developers can just go to the site, build.smartthings.com and they get the documentation, and they get a sandbox in our cloud which means like a private play area that they can start building against right away.

When they choose to, when they want to share it, and they have a submit button, almost like if you're building an app for an app store or something that exists on a mobile phone. And in so doing, they're saying, oh, I'd love to share this thing I've built with the outside community and that will enter into a process where we have a team instead of tools now, where it's different. If it's a device, we have almost a structured methodology for reviewing the risk levels around that device for bringing it through physical quality assurance, for entering into a relationship between SmartThings and the device maker to know that there's ongoing support. If something changes there, there's an issue that happens with that device we can escalate so on. And it's different for apps and services, because there's not a physical device involved in some of those as well.

So summary would be, we're leading the way on sort of creating this certification program and a team with a specific funnel for the Smart Home where you can make that clear, where it's still open for people to innovate very quickly, but then what the consumer sees are just in the app or just the certified devices on today.

So right now, to give you a specific example, there's more than 19,000 devices that have been created in the platform, discrete types of things, meaning everything you can imagine and a lot of stuff you couldn't imagine being connected, I mean it's just insane to watch on the sidelines for me, but there's 120 or so certified devices that if you're using the mobile app, you can discover that I could go purchase today. And that's the difference between the ones that have just been done by developers on the outside and the ones that we've actually tested all the way than the ones where you can encourage consumers to go and buy it. So it'll be a very tight funnel. Hope that helps. Yeah.

Additional questions? Okay, all right. Thank you. I look forward to more updates in the future.

Robert M. Yi

Thank you, Mr. Hawkinson. We'll take about 20 minutes break and the next session which is the last presentation for today, will begin about in at 03:35. We have coffee and snacks, light snacks ready outside.

[Break] (01:56:19-01:56:40)

MANAGEMENT DISCUSSION SECTION

Robert M. Yi

Okay. Now we will begin today's final presentation. Please take your seats. Final presenter is Dr. Daniel Lee, VP of Samsung Electronics Memory Business.

Please join me in welcoming Dr. Lee to the stage.

Daniel Lee

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Hello, everyone. My name is Daniel Lee as introduced. I'm the VP of Samsung's Electronics and currently leading Flash Product Planning Team in Memory division. Today, I'm very pleased to talk about what Samsung prepared and what it's currently doing for the year of revolutionary flat screen era.

Okay. So before going to [indiscernible] (01:57:36) Samsung products and what kind of technology we prepared, I'm briefly talk about what is current trend. So we are living in between second era and third era. The second era represents the data [indiscernible] (01:57:53) era and the third era represents the big data and the cloud computing era. So we want to define this total year is big data creation. So the data creation and the consumption is exponentially increasing and everybody expects, around this year, the total 44 zettabyte data can be stored in data center. So can you imagine how big this 44 zettabyte?

So currently, it's the most, biggest data center under construction in Prineville, Oregon State. It is 307,000 square feet. It's five times bigger than the current football field. It holds 3,000 server legs and it stores almost five exabytes. So you can imagine to hold this 44 zettabyte, total 9,000 data center have to be build again. And even at present, total 45,000 square feet is required. So we, the flash memory industry, believe this is really good opportunity and golden time for preparing our flash memory solution, okay?

This [indiscernible] (01:59:20) is actually certified what is expected. [indiscernible] (01:59:28) company recently showed the outlook of NAND Flash demand. As you can see, year 2019, the total growth of our NAND Flash demand is more than 40% expected. So compared to this year, the year 2019, the total bit growth and the bit demand requirement is four times than current existing NAND Flash demand which means we have to build four times bigger factory nowadays. If we divide into – each application by application, you can see all the area looks like pretty positive and bright future. And especially the SSD is the biggest growth rate we are expecting. So we believe SSD will be the new driving factor on the future in the flash memory demand.

Okay. Let's look at [indiscernible] (02:00:32) deal. So this data is the analyst data and last year, we, Samsung, got the number one market share position in year 2014. And our market share is around 32.9%. And since 2002, 13-year consecutively number one position with Samsung Cards in NAND Flash business area, okay. If you look at the right side, in each application by application, we are number one in the mobile storage area, in the SSD area. And this data more than five years we're consecutively number one position in SSD.

However, in some area, we are not in number one position. However, we are currently specifically focused on this server business area and we, Samsung, strongly believe we can go to number one position pretty soon.

Up to now, Samsung feels very good in business area. However, we, Samsung not just focus on the business area and the revenues and the profit. We just thoroughly want to focus on the technology innovation and what actually our customers want. So we want to provide true real value to our customers. For example, in mobile area, we just achieved fastest storage may not be enough. All the mobile users want more user experience enhancements and more battery life, typically more beneficial to mobile end user. But similarly, PC, the sleeker and the more thin and light design comes out. So if we reduce the compact size a little bit lower or lower and the smaller, maybe it can be more beneficial to our end customer.

We, Samsung, will now specifically focus on this deal value and how we provide using our flash technology and the technology innovation to give real benefit to the user. Okay. This is the main point and with that point of view, I'm going to talk about what kind of product we prepared to each of our area. Okay. Let's first move on to the NAND Flash and [indiscernible] (02:03:02). So year 2003, from the 70-nanometer technology, we, Samsung, every year reproduce one generation of new NAND technology.

And by going like this, and around 10-nanotechnology and beyond this technology, everybody told us [indiscernible] (02:03:32) process technology is getting close to the technology limitation and the cell to cell interference and photolithographic equipment limitation, it's very hard – and everybody says it's very hard to go further down shrinking. To help Samsung, we will think in different approach way and we first introduced our 3D V-NAND in Flash memory technology and we introduced over 2013 in [indiscernible] (02:04:02) World Flash Memory Summit and we went to mass production from October 2013 and this is our first generation 3D V-NAND technology.

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So we are not just one-time developing this 3D V-NAND technology. Last year, we successfully introduced the second generation of our V-NAND. We increased the layer of Vertical NAND into 32 layers. Furthermore, we successfully introduced the 3D V-NAND in this year and we've successfully launched it together with our SSD and in the market. So we will keep continuing this kind of chronological or legendary journey into the next level of our V-NAND. And within this year, we've introduced our third generation V-NAND and you guys may know where and when we can introduce this 3D V-NAND, okay.

So let's look at everybody. All over the world, market already knows what is the real benefit of our V-NAND? But I'm going to revisit to remind all of you what is the benefit? So V-NAND, it can increase the dense easily by Vertical way. However, it can give some more benefit in performance and power consumption because the cylindrical cells, it can hold more electrons which means more or less cell to cell interference. So that's why you can increase the program speed and light speed and power consumption is much lower compared to [indiscernible] (02:05:48).

And everybody is amazed with this 10 times [indiscernible] (02:05:54) increase. Due to this quality of V-NAND, the industry in server and enterprise area currently utilize this 3-bit V-NAND and planar 3-bit with SSD is not much popular in server and enterprise area. So not just increasing the layer in V-NAND, we are also very focused on improving the quality of V-NAND. So by going to second generation and third generation, we are improving the performance and the power also. As you can see, our second generation V-NAND can be used to power almost half compared to previous generation. So this kind of technology innovation, Samsung will keep proceeding. So thereby, real value we can provide to the data center and the enterprise customers.

But let me be clear, we are not just focused on the V-NAND technology. Samsung is keep continuously break through the planar NAND process technology. So within this year, we're going to produce our first 1D nanotechnology with planar NAND, and we believe this is world's smallest planar cell we can produce. Likely to V-NAND, we also focused on the quality of our planar NAND.

So as you can see, our previous generation one 1Y-nanotechnology planar NAND, the performance in program time and power is drastically reduced compared to previous generation. We're going to keep pursuing this kind of journey into the planar NAND and within this year, we will show the real progress during our planar NAND. So let me be clear, we Samsung has clear two-track strategy in flash memory technology both in planar and V-NAND. We will keep pursuing and break through all the technology innovation, and thereby we can give real value to our customers.

Okay. Let's move on to the storage area. So from now on, I'm going to introduce first the mobile strategy and then SSD, I'll talk about. And over here, at the very beginning, as I told, we Samsung, the main goal and objective is providing real value using this strategy. And what kind of real value we can provide? That's the main topic on my today's call.

So this February, everybody knows that Samsung successfully introduced the Galaxy S6 and the S6 Edge to the world, and all the world wow on this design. However, this mobile device has many new and high-end technology inside. In mainly dividend point of view, we successfully introduced our two most recent technology solutions. So one is UFS and the second one is SD DDR4 we introduced. To that end, officially award for this new Samsung Galaxy S6 and they appreciate new standard storage and the V-NAND device is successfully launched and they appreciate this kind of effort.

So let's look here, what is the UFS? UFS is exactly productive, the most famous SSD technology into mobile world. The conventional EMMC technology utilized the synchronous IO, which means the next IO operation have to be weighed before current IO operation ending. So if we'll need, we only know best to lead kind of activity, it has to be weighed during long lifetime. However, UFS introduced the high-speed interface and then through the synchronous IO in protocol, which means these white lines can be possible, and the latency-wise it's really fair.

In benchmark score as you can see, the sequential LED light and random LED light performance is drastically increased. Especially in random light, what is double performance management you can achieve. So current to mobile and smartphone looks like the small PC, right, which means a lot of this LED IO currently you can observe in the smartphone. So this is next generation of mobile storage we successfully introduced in this year.

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And let's look at what is the real benefit? Not just I want to talk about the benchmark score, so we studied these three real user scenarios, mobile texting, scanning, and there's game loading and [indiscernible] (02:11:28) scenario. As you can see UFS can be executed really best way compared to existing, most of the decent EMMC 5.0 certification. And some people may will be worried about current consumption because it accompanies the 6-giga BTS user interface yet, the current consumption is little bit higher. But however, the most important to elongate the battery life is energy consumption. So this graph shows energy consumption. And during this workload scenario, the UFS can consume little bit more current, thus more power consumption. However, if the only pathway executed is I/O [indiscernible] (02:12:20) so thereby the total dimension represent energy saving is much lower.

So we benchmark using some famous battery kind of scenarios and we observed more than 30% energy savings possible. So this is one example we can provide real value to the end users so total the lifetime, the smartphone can be extended using this [indiscernible] (02:12:50).

So from this year, Samsung will distribute this UFS product to the worldwide. We successfully collaborated all the famous eco-provider. We prepared a system and the software and everything. We will now fully support our technical service to our customer who want to launch this UFS. And I believe Samsung can contribute this UFS from this year.

So this is the second mobile strategy we're going to introduce on today, which is the UFS card. UFS card shares exactly the same 6 gigabytes [indiscernible] (02:13:43) serial interface together with the invisible [indiscernible] (02:13:48) and the shape is right here because it used 6 gigabytes serial interface compared to current existing [indiscernible] (02:14:06) card the performance wise is more than double. And you guys know, currently there are USB3.X kind of high interface and LTE requires high-speed download and storage interface. So this new UFS card can perfectly fit to those high-end requirements.

And furthermore, this is [indiscernible] (02:14:32) card. We publicly open this old technology and form factor and all the electrical specification to the [indiscernible] (02:14:43) standardization committee and thereby we will not share this new technology with public IT companies. You guys know current SD cards have some portion of the royalty, right? So if you buy those SD cards, eventually you have to pay some portion of money, right, for those royalty portion, so we are not going those direction, we will not share this technology all the while so thereby we can provide more benefits to end user in the first wall.

Okay, let's move on to client area and the client SSD area. So this is trend the current PC area looking for slicker, and thinner and light, and low power and high capacity and multi-tasking and fast kind of performance. The SSD size and technical trends exactly follow this direction. So SSD, the density is clearly increasing and the performance of the SSD goes together with PCI interface. And from form factor-wise, this goes beyond this 2.5. Already, M.2 is mostly popular and the mSATA version also. And we're going to produce this kind of one package SSD solution pretty soon.

So what kind of Samsung products prepare and what kind of value we can give? So in year 2013, we first launched our branded SSD with the name of Evo Series. This is industry-wide the world first 3-bit based SSD. We successfully launched this 840 Evo in the world. It's really good and sell very well. And last year, we successfully trended into the second generation of our 850 Evo, and this utilized the world first 3-bit V-NAND SSD technology. And with enhance of many good quality, this is wow from the world.

And at the very beginning, we named this Evo with the hope of this SSD have to be for everyone. So it goes really they call lightweight their way. And this year, we're going to prepare another kind of third generation of branded SSD, and they will be coming soon. So you guys will enjoy this new technology.

And secondly, we also introduced some nearly cost effective SSD for the end user. So this is basically target for the entry-level client PC. So you guys know the currently existing client HDD could not reduce below certain price point. We specifically designed this SSD and minimized all the cost, and thereby we can – with the same level of this HD price, we can provide this huge benefit for the entry-level PC-client area which means the Flash technology is no more high-end users. It publicly goes down with and lower area. So we're going to provide this kind of value with our current existing client SSD.

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Next, we are not sitting on the currently existing SATA SSD and the commoditized SSD world. We prepared next generation of our SSD which is the NVMe. The NVMe will come within this year together with Intel. We prepared industry and standardization all the software layers together with Intel and successfully launched the world first client-level NVMe SSD.

So NVMe SSD will utilize the PCIe high-speed serial interface, thereby the speed, performance-wise, you can ideally generate the 4-gigabyte per sec and thereby the real user scenario you can benefit with this new technology. And above all, the latency issues you can reduce. So even though this is just 2 microsecond, because SATA is attached into the [ph] PCH south bridge (02:19:47) area, but however, this NVMe is directly attached to the CPU. So if you reduce the more software enhancements, we can achieve much more user experience with this lower latency.

Finally, using this technology, we prepared the BGA SSD. The BGA SSD is simply one packaging. It can reduce to almost 85% smaller than existing small M.2 SSD. So with this [ph] helpful \$0.85 [indiscernible] (02:20:25) the PC client can increase the more battery 10%, which can extend your carrying the PC and notebook. So this is one of PC impact for the end customers and thereby we can provide. Furthermore, our small BGA SSD has almost the same level of NVMe performance compared to M.2, which means we will keep sustaining the same level of performance and while reducing its package size further and further.

Let's move on to server side. So at the very beginning, I represent the data is exploding very quickly and exponential way and the many new service has come every day. So this new service required really fast response. So with the help of this new service, more SSDs are popular nowadays in hyperscale data center area and enterprise area. So this is one of good opportunity for our server class SSD.

What kind of SSD we prepare at Samsung? So first, the value SSD we prepare. So this is the existing SATA. The current existing data, hyperscale data center requires two key metrics, one is absolutely cost effectiveness and second one is performance. Performance means not just the fastest storage. The hyperscale data center requires this kind of sustained performance. So almost 99.9999 latency have to be consistent clearly. So our value SSD for hyperscale data center prepares like their way, and our SM863 and PM863 is popularly adopted on those hyperscale data center area.

You guys know hyperscale data center [indiscernible] (02:22:44) the current existing select size and they're really concerned about this TCO, which means total cost of ownership. So that's why in open computing platform, they introduced really thin and small next generation of the hyperscale data – hyperscale architecture.

So over here, it has very limited dimension. So it has almost tight requirement which is the 8-watt power consumption limitations. However, they want NVMe technology, so that's why only fits this M.2 specification only. So we prepare together with this next hyperscale data center architecture buy and successfully we verify our SM953 and PM953 for this architecture. So we're going to be number one supplier for this new architecture, and within this year, it is showed off in the real market.

And then for the enterprise application, we've prepared PT-SAS. PT-SAS means Pretium SAS. And this is industry-wise the world's first 3-bit base SAS SSD. So, in enterprise, nobody utilized the 3-bit SSD. However, we prepared this PT-SAS together with the helpful in our 3bit-based V-NAND technology. So thereby, it gives real benefit to the end users in especially the storage guy.

What kind of benefit? We are not simply replacing the currently existing SAS HDD. We can give just one SAS SSD can replace multiple, the N number of SAS HDD. So one study together with our customer [indiscernible] (02:24:48) with our 16 terabyte PT-SAS can have almost the same level of the 13, 1.2-terabyte 10-Krpm HDD, almost the same level performance. And because we can replace the 13 HDDs, thereby we can provide total 15% CapEx reduction for this storage vendor.

So you can imagine 13 HDD sizes [indiscernible] (02:25:23) and you can reduce just one existing HDD. You guys already know in our client form factor area, we can much reduce the form factor size, right? So if we must sit on the current existing 2.5 or 3.5 form factor, we can much reduce the total dimension size in several area, likely previous M.2, right?

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Current Quarter: 53829509.861
Current Year: 213489616.000

And finally, we have the world's first enterprise class NVMe SSD, we successfully launched in year 2014. And this year, we moved to second generation NVMe. And we will also introduce our PM series, which means 3-bit based NVMe can be utilized. So currently, it is high-end enterprise NVMe SSD is utilized in high performance computing area and the big data analytic area and the cache kind of area is very limited application. But we believe together with this 3-bit technology, it can be widely adopted in the enterprise area.

So up to now, we just talked about hardware solution and storage solution. Samsung recently exploring new frontiers, which means we are not just proceeding on the hardware solution. We want to move to vertical convergence area, so you guys everybody know, Samsung last year successfully acquired two software company which was the NVELO and the Proximal Data, right? So using these software technology, we strengthened our vertical convergence capability, and thereby, within this year, we're going to show up our new product, the cache software together with our SSD technology. So this is the second approach. Together with the software and the convergence, we're going to move off the second level of the value proposition to the real end user. And secondly, we are also developing the new standard and new featured SSD. We call it the storage intelligence.

Storage intelligence means our SSD is not just a passive storage device anymore. It has some kind of capability, the intelligence and [indiscernible] (02:28:01) something like that. And we successfully introduced the multi-stream features and this multi-stream feature is successfully accepted in the world famous T10, the SAS standard committee and [ph] nvm.org (02:28:18), the organization so this is next standard features for SSD.

So we're going to keep pursuing this kind of technology innovation for the next level of standardization and we will keep pursuing and prepare the next real value for the customers. So likely that our Samsung, the memory division is no more a memory company. We're going to provide real value through this solution, which means we're going to provide end users real better light with Samsung Flash Technology. And our vision is providing real value for each person's private life as well as his professional life. And Samsung will give you and promise we're going to pursue this keep goes well.

Okay. Thank you for listening my talk and this is end of my talk. Thank you.

Q&A

<A - Robert M. Yi>: Now, if you have any questions, please raise your hand and use your microphone, please. Yeah.

<Q>: Thanks for the presentation. Looking at the V-NAND, you talked about the performance improvement compared to the Planar NAND. Can you little bit talk about the cost of the V-NAND, that third generation? I mean also why you put a question mark since the market believe it's going to be [indiscernible] (02:30:05) in the third-generation V-NAND. What's the cost advantage over the Planar NAND?

And the second question, in the SSD performance, controller IC is one of the factor for the SSD performance. Can you a little bit talk about Samsung's controller IC?

<A - Daniel Lee>: Okay. Translation first. So you talked about the cost and the controller. Cost-wise, it's very tricky. So everybody knows the V-NAND requires a huge investment, right? So cost is very tight in coupled with the supply, the volume and the investment, right? So I could not specifically give the real cost. That's why I put the question mark over there. So maybe soon, we can adjust and officially give how much performance [indiscernible] (02:31:06) we can give you throughout in our communication to you. So that's not in my wording. I'm the more engineering guy. So sorry about that.

And secondly, the SSD controller. So I missed those kind of capability over here. We Samsung is the only company we have everything, which means we have a controller designed by ourselves and we have the foundry nearby our sister company, and we have DRAM, we have CCV technology and we have the manufacturing facility, which means we can do real fast turnaround time compared to any other vendor, right. That's why we can really work together at the very beginning because the flash technology can give this kind of feature and technology thereby, our controller team understand the feature and prepares those technology. So we are really – harmonious way, we can work together so

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that's why we can provide most valuable solution I believe. We can produce [indiscernible] (02:32:17). Is that a good answer for you guys?

<Q>: Hi. Two questions. You had a interesting slide where you have talked about the slotting SSDs, replacing HDDs in even mid-critical or sub-critical in requirement basically. When do you actually think we see it happening and unlocking that part of the market for SSD enterprise below SSDs or flash arrays are already replacing [indiscernible] (02:32:49) for mission critical which is already happening?

And second question is could you maybe help us understand a little bit now what is the penetration of 3D NAND in – by various interfaces, so SATA III, PCIe or NVMe and then SAS and how this will evolve with third-generation 3D NAND? Thank you.

<A - Daniel Lee>: Okay. So you are talking about our [indiscernible] (02:33:16) in enterprise, right?

<Q>: Yes.

<A - Daniel Lee>: Yeah. So currently we are on the collaboration together with our enterprise consumers. So they are currently evaluating and pretty soon, you guys can see this kind of real change again. It will happen pretty soon. So I could not open because this is consumers' information, but you guys can pretty soon see those kind of transition.

And secondly, the V-NAND penetration, so it's widely adopted in SSD area and pretty much soon, we will move on to other direction, if we can – both our consumer and our side, satisfy each other, this is the win-win business game, right? So if we satisfy each other, it can soon be penetrated and widely adopted in all the storage area, I guess, as I believe. But for now, it's fair to say that PCIe/NVMe is probably the lowest penetration level of V-NAND in the product portfolio, as I said.

So the PCIe, you guys know, in client area, only the big guys have the PCIe solution and the other vendors are still waiting. For Intel, there is Skylake CPU comes out, right? So you guys know that this year, the Skylake will be launched and which can drive really faster PCIe/NVMe penetration in the SSD market, I believe.

And for the enterprise, already the PCIe is well utilized. But the enterprise world, the price is really a huge bottleneck, right? So that's why Samsung this year introduced three [indiscernible] (02:35:04) PCIe and NVMe card and 2.5-inch SSD, which will accelerate the production of NVMe, SSD in enterprise, I believe, okay? Yeah?

<Q>: I just have two questions.

<A - Daniel Lee>: [indiscernible] (02:35:24).

<Q>: Two quick questions.

<A - Daniel Lee>: Okay.

<Q>: Can you elaborate on your firmware activity? I think that's where you can certainly differentiate and move from a component vendor to a total system solution provider? So, anything you can provide on that will be great.

And then, second question, there's some misunderstanding or some chatter in the market that some of the V-NAND devices aren't really behaving like non-volatile. Is there any data or a third-party research that you can reference that would help us understand the success and performance of the V-NAND as it compares to Planar NAND?

<A - Daniel Lee>: So, number one question, our firmware capability. So as I answered previously, we have all internal invested ourselves. So, I actually going start this firmware development at the beginning, 10 years back. So, we, in stage-wise, step-by-step, we have prepared all this capabilities. So, now there almost full software team is inside our company. I could not tell that you'd exercise, but we long time prepared this. And all this firmware and the hardware and the enterprise component technology and DRAM is everything is required to generate this real, high-tech SSD.

So, for example, [indiscernible] (02:37:03) kind of the SSD controller requires more than just one single CPU. It has many CPUs which means already likely the PC CPU kind of technology is inside the controller. So, all new technologies involves inside technology SSDs. So we already prepared those software teams inside in our SSD.

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And for your second question, what is the real benefit of the V-NAND? So, just search the website. So, everybody – there might be many kind of newspapers and papers and white papers, all of those, you can see what is that actually. And our customers' feedback can also – you can find that from the website, okay? But if you need more, throughout our communication team, we will deliver those real benefit to you, right?

<Q>: Small question. So, on the limit of NAND flash, I mean, so Planar NAND, when is the NAND – would that be the dead-end of the scaling?

<A - Daniel Lee>: No.

<Q>: Or can we see even below...

<A - Daniel Lee>: No. I don't think so. So, Samsung is still – I can say like this way. So, at the very beginning, my career started from the [indiscernible] (02:38:37) and then doing the component development and I was the circuit designer, almost for 20 years or 22 years actually. At that time, everybody says, okay, this is the last flash technology. And this journey keeps continuing like 22 – 22nd years up to now. So, this is like – and not really those kind of limitation existing. Yeah, everybody says it's hard, but technology innovation is always happening, right? So, who knows?

But Samsung keep pursuing this Planar NAND technology, and that's why I said we have two track strategy which was one Planar and one V-NAND technology. This year, 1G, next year, who knows.

<Q>: Can there be below 10 nano?

<A - Daniel Lee>: Yeah. Why not?

<Q>: What about 3D NAND, what about V-NAND? You are more into third generation 48 layer, now how many layers can it go?

<A - Daniel Lee>: 48 layer?

<Q>: That's upper limit in the layers in a practical commercial terms.

<A - Daniel Lee>: I could not say, but you can – I can analyze like this way. So when I was teenage, our apartment, the storey is just 10-storey or something like that. But nowadays, you guys see more than 100-storey building available right. So I could guess that could not be easy to stack up. But you guys think, may think about this is the huge vertical side, right. So increasing the layer, it may be tough and hard, but technology innovation is always happens. So I'm pretty sure our future will be bright and very positive.

<Q>: Well, lastly, leading V-NAND – 3D NAND so much in the industry, does that mean that you have a lot of IP there and your royalty in the V-NAND will be considerably lower than the Planar NAND or it's other mechanism?

<A - Daniel Lee>: Yeah. We prepare this technology more than 10 years. So yeah I believe we have strong IP leadership but I don't know about where this kind of business area, however. So maybe our communication team can answer this way like.

<Q>: So, on your 3D NAND, you're actually going back on the process node than you're stacking up in layers. So, what's the decision process between the tradeoff between layers versus the process node? Presumably, you're going back for more stability in terms of manufacturing. But on the 2D, you have 1X, 1Y available. Presumably, you're just doing that to stabilize the technology then apply it to 3D later. So, what's the tradeoff there?

<A - Daniel Lee>: So, that's very good question. So, how can I answer it? So, we can simply likely answer like this way. So, always as I told in today's talk, we are going to provide more value to the customer, right? So, we just now move on to next generation of V-NAND simply enhancing like just 10%, right? So, we have certain guideline about that. We will now move on to the next generation. So, just – so all kind of pictures is combined together. But – so our decision point is giving real value for the customer. That's the main point. And you guys can expect, right?

Company Name: Samsung Electronics
 Company Ticker: 005930 KS
 Date: 2015-06-03
 Event Description: Investors Forum

Market Cap: 188.10TR
 Current PX: 1277000
 YTD Change(\$): -50000
 YTD Change(%): -3.768

Bloomberg Estimates - EPS
 Current Quarter: 40870.816
 Current Year: 152068.973
 Bloomberg Estimates - Sales
 Current Quarter: 53829509.861
 Current Year: 213489616.000

<Q>: Okay. And just related to that...

<A - Daniel Lee>: Please review our previous generation, how much [indiscernible] (02:42:38) that we can have. That will be one of guidelines for you.

<Q>: How do you envision sort of that monolithic die chip density – possible chip density all the way up to 256 gigabytes or is that possible? Or...

<A - Daniel Lee>: Yeah. It's easily – so, using V-NAND technology, we can easily density level up. But, however, the industry, our customer is now moving up that way, right? So, we want – so, you guys utilize not just 128 gigabyte, 1 terabyte right now. So, that will be one of decision point, right? Everything is tightly coupled with price and density, right. It will be the answer for you. But the technology will be absolutely ready to increase with this new technology.

<Q>: Okay.

<Q>: I have one long-term outlook question on the new applications market for NAND Flash. If you have to store a lot of data on Smart TV, 4K TV and in your Smart Card in the future, what type of NAND product is most efficient for each application, for example eMMC versus SSD or the [ph] UF (02:44:03) standard may be the best solution for TV or a car?

<A - Daniel Lee>: Very good question. So, it depends on what do you want. For example, do you want to carry this 4K video content and data by yourself? So likely, those kind of situation, you will select external card, like external and SSD kind of storage. But if you want to carry just one phone, that means that the eMMC can store, right? eMMC may not be enough for this high speed 4K content, maybe UFS, right? So it depends on then the user selection. So we Samsung could not control from user perspective, right. We are just giving the solution for end user. So end user wants, we always produce our solutions.

<Q>: Okay.

<A - Daniel Lee>: Oh, time is over. Okay. So one more last here. How many question I can accommodate? Okay.

<Q>: Okay. Just on 3D NAND. Will all 3D NAND fabs always be greenfield, I guess in [indiscernible] (02:45:19) where your first fab is or would you ever see any retrofit or can you retrofit Planar fabs to 3Ds? Is that a space for CBD tools if required?

<A - Daniel Lee>: This is very tough question. I'm not that technology geek. Sorry about that. So maybe throughout our communication team, we will answer to you. Sorry about that. I'm not the process engineering guy. Okay?

Okay, thank you for all, guys. Enjoyed my talk, okay?

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