NVIDIA Corp at Raymond James Institutional Investors Conference

Company Participants

- Colette Kress, EVP & CFO

Other Participants

- Steve Smigie, Analyst, Raymond James & Associates, Inc.

Presentation

Steve Smigie {BIO 5514423 <GO>}

All right. Good morning. My name is Steve Smigie. I'm the semiconductor analyst here at Raymond James.

It is our pleasure to have NVIDIA presenting for us this morning. We have Colette Kress, who is the Chief Financial Officer of NVIDIA. Welcome.

Colette Kress {BIO 18297352 <GO>}

Thank you.

Steve Smigie {BIO 5514423 <GO>}

So let's just start with a high-level strategy question. You were talking a few seconds ago, you made some I think important strategic decisions on focus a few years ago and the rewards have been pretty good. So I was hoping you would talk us through a little bit where were you guys three years ago and how did we get here and what's coming after that?

Colette Kress {BIO 18297352 <GO>}

Okay, let me see if I can do a first kind of overview a little bit about NVIDIA. Not necessarily going all be way back 20 years. But really what the last five years have been and where we stand today.

So keep in mind NVIDIA's business model is focused on four market segments that we participate in. The first one that we participate in is our gaming business. Our gaming business has been with us for since the beginning of time where we focused on creating the best high-end graphics that we can for an overall PC platform.

Additionally, we also have our pro visualization business. Pro visualization is essentially taking those high-end graphics to the enterprises and to very key workloads in terms of design, product design and building where those graphics are very key and important, as well.

Thirdly is our data center business. Quite a bit of focus on that most recently. Our data center business takes a little bit of a different focus not necessarily on graphics but really talking about the GPU as a center function of overall compute and doing accelerated computing and in the most recent right now working on AI and deep learning to be key functions and workloads stemming out of the data center.

Our fourth business is our automotive. Our automotive business is a combination of both our infotainment platforms that provide high-end graphics to the center console or the digital dashboard but also a significant amount of work on the future of autonomous driving. And using our AI platform, the very similar AI platform that you see within the data center. And using that to build autonomous cars moving forward.

Each of these four businesses has one thing in common, that it has actually the exact same technology underneath it. We have a unified platform approach that using the GPU across all four of those different segments is where we start. That is the basis of our Company, we built the GPU and invented the GPU some time ago but now we've continued to advance that, over the last three years focusing on the platform approach.

Moving away from looking at our business in terms of components or component inside of a PC or component inside of a server but looking at it as a full end-to-end system or solution that focuses not only on that strength of the hardware and its performance but the overall development platform, the development language, the overall tools and libraries in order to use that for the individual workloads. So that strategic approach has allowed us to move into these extremely difficult and challenging problems as that's the center of what we like to focus on. Areas where not easy to solve and focusing on artificial intelligence, deep learning as well as autonomous cars have been so helpful to us in terms of creating our strategy going forward.

Steve Smigie {BIO 5514423 <GO>}

That's great. Thank you.

So within those major areas that you outlined I was hoping you would talk a little bit about how we should be thinking about growth in each of those. Because it seems some of them are hyper growth and gaming seems very solid and growing much faster than I would've anticipated but maybe not the same rate for various reasons as the other businesses. So any color on growth would be great.

Colette Kress {BIO 18297352 <GO>}

Yes. So each of our businesses, each of those four businesses are definitely in different stages of maturity rather than actually saying different stages of growth. If you think about our overall gaming business, the gaming business for at least the last five years type of CAGR has grown about 30% and in this last year even grew stronger than 30%. But what you are seeing there is a continuation of the importance of gaming moving from just a situation where the gamers are actually playing with their PC back but actually playing as a social experience.

It is becoming a social platform that you are there with a multitude of friends. You are playing online, your friends are there with you.

But then there has also been the evolution of eSports. eSports really is a spectator type of sport. So essentially just watching others again, learning better how to play by watching videos of others games has become a key part of gaming.

So it is essentially gaming as a sport is mature. The business has definitely grown faster than the underlying growth. But that is probably multiple factors associated with the better games that have been coming out, the social platform but also us growing the overall gaming market or the overall TAM that we can address with our overall platform.

When we moved to pro visualization, that business has been a very mature business where we have a leading position as our GPUs are considered to be best-of-breed. Best-of-breed in terms of any type of product design or any other building design that you may want to do or anything that you may want to do in the film industry in terms of special effects. That has tended to be something that has grown in line with maybe a GDP or in line with average enterprises.

Because they are going hand-in-hand we are solving many of those enterprise graphic problems that we see. This last year, though, we had a very, very strong year of it growing about 11%. And that growth was largely due to the moving of higher performance and mobile types of applications and workstations for you to use your graphic cards with them.

Moving to data center, hard to say in terms of where it is. We've seen tremendous growth in our overall data center business. Our data center business for the last three years, let's call it about a 50% growth rate. But in this last year it grew 145% and in Q4 it tripled.

So it is on a very strong trajectory where we have really honed in on some of the most challenging problems that are out there in areas of artificial intelligence and deep learning training, which is one of the key frameworks to solve some of those problems and we are at the forefront. Both the forefront in terms of the GPU being extremely well-positioned in terms of its performance and capabilities. But also the strength of our overall development platform and software solutions that we are working to teach many of the different places around the world to use. And we

continue to probably consider ourselves to be in the first innings of our data center business as we move forward.

So that leaves us our last one in terms of automotive. Two different pieces in there. You have our automotive business for infotainment systems that's rather a mature space.

Most of the cars that you see today incorporate infotainment systems at different degrees. We partake in the premium levels where that key graphics differentiates it within the car. And we have well penetrated many of those high-end cars as we see now and has had very strong growth rates as we've continued to grow that.

As we move forward, though, that business will change or transform as we focus on autonomous driving. And focusing there currently on the road we have one of the very first level 3 autonomous driving vehicles on the road with Tesla. We have continued to announce at our CES just a couple of months ago in terms of our continued work with Audi and Daimler also working on their autonomous platforms going forward.

But we are still in the early stages of that as we know that the automotive industry has some time in terms of getting those actual designs. But I think you will see them soon. And you have even most of the car companies focusing on 2020 is the year in terms of a lot of those platforms coming forth. So agreed, all in different stages, all in different types of growth rates but all very, very important businesses to us.

Steve Smigie {BIO 5514423 <GO>}

That's great. Just to go to gaming because that was the heritage or still very strong, can you talk about how that's changed? It seemed to be very tied to the PC historically. But now I don't know if it's driven maybe more by when you launch a platform. So how has that changed in terms of how you generate revenue off that business versus traditionally?

Colette Kress {BIO 18297352 <GO>}

Yes. If you actually think about this a couple of years ago, three, four, five years ago, it was very common to talk about what is the overall PC market going to grow in order to try and determine what our overall gaming business revenue would be. But the reality is that's not actually how this gaming market works. Most of our gamers today and gamers that are coming on board usually already have a PC. And this business is about an add-in card market or adding in the underlying platform to improve your overall performance.

We sell most of the time an add-in card and we are not actually selling a true PC. So that evolving business has really been where we have concentrated on that platform in terms of the sale.

But some other evolutions of what has happened over the last couple of years. One of them is really the mobility, the mobility of the gamers. The gamers love their high-end cards that gives them the best type of performance with the AAA production value games that are also coming out. But they also want that mobility to be able to essentially game anywhere.

So we have taken in this last year the exact same performance that you can get in a desktop to a mobile laptop performance. And now you are seeing a market really high performing overall notebooks, those that maybe in the $2,000, $2,500 price range for an overall laptop that enable you to have that high-end gaming, as well. And that market is actually growing very strong and growing stronger than our overall desktop business.

But you are continuing to see the move in terms of mobility, the ability moving also to the cloud. You have seen us at CES talk about our GeForce NOW experience where we will actually be working on streaming down games to whatever different types of device, a device that right now might not be enabled with a high-end GPU. And they will be leveraging the GPU in the cloud so that we can bring high-end gaming to essentially any gamer or any PC whether or not it already has a high-end GPU involved.

So these are some of the key areas in the evolution that we have seen. When you see gamers coming into renew or refresh what they have been using in terms of the GPU they are essentially coming in and buying some of our greatest platforms as that performance that improves their overall experience even though it may be the exact same game that they have been playing for a year is key to them. So the overall price to performance continues to improve.

You even saw us with that last week. Last week we launched yet another graphics card, our 1080 Ti, in the high-end part of the market which now even allows 35% more performance versus our last highest card, the 1080, that is out there.

Steve Smigie {BIO 5514423 <GO>}

And not just for the gaming market but one area that that seems very interesting is virtual reality. I have to say at a recent Analyst Day I got to try, I think you call it VR Funhouse, is that the -- and it made me a believer. I tried 3D TVs in the past -- God, this is awful, I don't know if I really believe in VR.

But I tried your system there, it was on two 1080 cards. And it was phenomenal. So can talk a little bit about the PR opportunity there and how you guys look at that at this point?

Colette Kress {BIO 18297352 <GO>}

Absolutely. So virtual reality is definitely coming to life and has over this last year. Virtual reality, one of the key things to make it a successful experience is the performance power of a high-end GPU.

If you want to do the high-end virtual reality, the ones that make it look tremendously realistic, that needs that processing power or the overall frame rate refresh that a GPU can overall provide. We have come out with Funhouse, Funhouse is our own game, to talk about the content and content capabilities that will continue to evolve over this space. Right now we have enabled almost every single one of our gaming cards in the gaming side of our house to all be eligible or equally capable of running that VR as we think this is an important next generation of high-end gaming.

Gaming where you come into the game not necessarily in one position but you can observe the game from any other type of position within that game. You can think about new evolutions in terms of the strategy within a game if we are talking about the virtual reality.

The content is also continuing to build. There is a tremendous amount of both startups as well as traditional gaming companies that are focused on building out that content.

So we are in the early stages of it. But just with everything it's a continuous play of additional hardware. The hardware is there to now endorse it, the content will continue to evolve, as well.

Steve Smigie {BIO 5514423 <GO>}

Great. I just wanted to turn to the data center. As you mentioned, last quarter was pretty amazing.

One area that I've found to be getting a lot of attention is artificial intelligence. And so I was hoping you could talk a little bit about how you enable that. But just generally to drill down a little bit more to NVIDIA. And how into NVIDIA's data center market and how you see that segmenting out.

Colette Kress {BIO 18297352 <GO>}

Sure. So when you think about our data center business, our data center business is actually five individual businesses underneath it.

So let me start with some of those pieces. We have been in the data center business for more than 8 to 10 years but where we started and which is still a key component of our business is high-performance computing. High-performance computing using a GPU as an accelerator in many of the high-end supercomputers across the world, supercomputers that are focused on high-end mathematical computations essentially where the answer is known but using a GPU as an accelerator taking work off the CPU enables the overall workload to be enhanced and complete sooner.

We are still in that business. It is still thriving, it is still growing very well within our business. But now that has expanded uniquely into other areas of our data center business.

Number two, we have been focusing on the work in terms of with hyperscale companies, companies like the Microsofts, the Amazons, the Googles, the Baidus, the Facebooks, where they are focusing on applications that you and I see every single day and use that are GPU AI accelerated. What we mean by this is think about, for example, areas of voice recognition, natural language processing, image detection, video encoding, things that are now AI enabled where throwing a significant amount of data together with the deep neural network surrounding it allows to serve back and answer at a lickety-split answer using artificial intelligence.

A common example of that would be search. Voice search on your phone which is now becoming a significant percentage of the search commands that happen is essentially an AI problem and those are generally being used with the GPU behind. So that's business number two.

Business number three is a focus in terms of on the cloud. So when you think about the hyperscales in some cases or when they actually move to a cloud service provider, one of the number one instances that is being asked for is an instance in the cloud that is also with the GPU. So the cloud service providers are building out instances for enterprises, startups, researchers to use a cloud to access a GPU in a rent type of model and to begin their work on bigger workloads.

All different types of problems facing the enterprises or the startups. And you see many of their work focused on large data sets and creating those neural networks in terms of in the cloud. They also are doing high-performance computing in the cloud and they also may be working in terms of virtualized GPU which essentially moves us to our fourth business.

Our fourth business is our GRID business. Our great businesses focuses on a one-to-many model of one GPU to many users. Essentially that GPU sits in the cloud and either streams down graphic-intensive information, essentially can carry the overall workstation as a whole up into the cloud, virtualize the application, virtualize the PC or some of the other things that we are seeing in that business.

Then our last business is our DGX AI supercomputers. Similar to the cloud and the desire to get started in AI in terms of the enterprises, a way to actually get to the enterprises quickly is providing them a containerized AI supercomputer versus a one-to-one TOEFL platform that we build. This is a case where the supercomputer comes with 8 GPUs installed and also comes, which is the most significant portion, is the software.

The software that includes our CUDA development platform but also supports all of the different AI frameworks that are out there and the overall development libraries and components for them to start right off the bat in terms of with their DGX. It is essentially just a plug-in and begin a lot of that AI work.

So those are our five businesses. All of them extremely important and strongly growing across. But it's a combination of focusing on the cloud with the hyperscales

as far as the outreach that we also are doing with higher education, enterprises and many of the different industries focused on AI.

Steve Smigie {BIO 5514423 <GO>}

Great. Thanks. Just as a follow-up to that, we had an artificial intelligence panel at our December tech conference.

And we asked them whose silicon is the most important out there for artificial intelligence at this point and why? And they said definitely NVIDIA from a hardware perspective and also the fact that they have CUDA is really what makes it work. And I think that's something you guys started in on maybe 10 years ago. So I was hoping you would talk a little bit about given that strength what do you think about incoming competition either maybe from FPGAs or from maybe AMD coming in with a newer-generation of GPU here?

Colette Kress {BIO 18297352 <GO>}

Sure. I think it's a good area to focus on. It's not necessarily just about the silicon because if you think about our platform there is so much more that comes with it. CUDA, for those that are not familiar, is our development programming language born within the Company eight to 10 years. But the important part is how many that we teach and have given the knowledge to overall CUDA.

Through these eight to 10 years of teaching it in higher education as well as in self-taught type of forums to where they are instructor led and certifications we have now reached more than 400,000 different developers around the world and taught them on CUDA. CUDA is essentially open. It is also very C++ like.

And what that does is it allows a programmer to not necessarily program at the hardware level but extract that up at a software level so that they can essentially write what they want the hardware to the application to do but are essentially writing what they are familiar with at the software designer level. But that overall outreach they continue to teach, they continue to provide additional libraries and different components that allows that ease-of-use of the GPU is really the key differentiation that we have against any other type of competitor that's out there.

There are many different other form factors of what we will refer to as acceleration. You could move to an FPGA, an ASIC or maybe even another GPU but we need to understand it is different. It's not the same as a GPU.

A GPU's performance capability is very, very high and its overall performance to watt is also a very important thing to keep in mind there. The downfalls of all the other ones is the ability to how do you get started, how do you actually do that programming in AI without that programming language and the amount of work that we have focused on in terms of the frameworks?

We keep an eye on every single framework in deep learning and deep learning training that is out there, TensorFlow Caffe to continue to find new areas for us to focus in terms of libraries to help them. But also making sure we understand what is best-of-breed for what industry to see that type of AI work.

So there is a lot of focus on CUDA and then some. We call it cuDNN, which stands for deep neural nets. Again, working on how do you develop those neural nets that are some of the key components underneath deep learning.

We have also expanded our learnings to what we refer to as the Deep Learning Institute helping people understand what is deep learning, how do you write for deep learning types of applications. And we are now teaching that around the world.

We started last year in all of our GPU technology conferences. It is one of the most sold-out types of institute and training that we do. And we will probably in the years coming forward reach probably hundreds of thousands of people that we have trained in our deep learning institutes, as well.

Steve Smigie {BIO 5514423 <GO>}

Okay. Great. Maybe just one minute on transition within auto.

This has been a more Tegra-based solution moving more to Tegra plus GPU or GPU as autonomous driving. Maybe a minute on that and a minute on margins because I want to leave a couple of minutes for questions from the audience.

Colette Kress {BIO 18297352 <GO>}

Okay. Really quickly on our autonomous driving, we usually talk about it after we've talked about data center. And the reason why is really an extension of some of the same work that we had learned in the data center regarding deep learning and AI. Solving the problem of autonomous driving and onlines is a AI problem requiring significant amount of compute to process what was occurring around the car and determine the steps.

There was nothing in terms of when you and I drove that we learned from an overall handbook and then got into the car. It is actually from inferring at every situation that we enable. And the GPU is just, again, well-positioned to take a lot of that work.

So what you see us doing is both a combination of putting the SOCs or Tegra brand together with our GPUs in autonomous platforms going forward which we call our DRIVE PX. And that is, again, a customized solution, scalable solution depending on any level that you want to do in driving.

We have heard level 3, level 4 types there. Level 3 could probably be completed with an SOC in terms of the car. Keep in mind they have in their data centers of those automotive companies DGX servers that are also working in terms of our platform

back in their data center to train the data that will eventually be in the car, as well. And taking on that work as they drive and realizing new information, their new data that will be also trained back in terms of those data centers.

But also we can expand that by adding new GPU in those cases, as well, to add additional more color, additional more complexity the problems that we can solve as we move from level 3 to level 4 and beyond. So our scope is to continue this work. You have seen us talk with Tesla, you have also heard us talk about Audi and Daimler in terms of working on their autonomous driving platforms, as well.

Steve Smigie {BIO 5514423 <GO>}

Great. Then you have got a bunch of new businesses. And so can you talk to us a little bit about how we should think about say margin profiles going forward based on all the new stuff coming in?

Colette Kress {BIO 18297352 <GO>}

Sure. Some margins whether or not we start with our overall gross margins, kind of our focus of the underlying parts of our business when we think about the hardware. Most of our business platforms now are really rich in terms of the software layer allowing us to provide an increasing amount of value that we deliver in terms of the products that we do.

Higher value allows us the ability to grow our overall margins from a gross margin perspective as we focus on the development layer in terms of with our R&D on the software. So if we continue to expand to these higher-end value platforms we do have the opportunity to increase our overall gross margins.

We have a little bit of a change this quarter as we renew our overall Intel licensing royalty agreement and move forward from that. But again, our focus is still going to be moving on expanding to the higher value added platforms and growing overall gross margins.

Steve Smigie {BIO 5514423 <GO>}

Great. We will see if there is a question in the audience. Okay. Great.

So I will just follow on with what you will do going forward with your capital. You have done a great job increasing margins, getting a lot of growth. What do you do with all that cash now? You seem to be very good at doing stuff with what you have already got. But is there anything out there that makes sense for you to go buy?

Colette Kress {BIO 18297352 <GO>}

So when we think about the cash that we have generated from the Company, the number one focus is going to be making sure we have invested that appropriately in

terms of into our business going forward. Our investments in there is very key. Investment in growing many of the markets that we just talked about.

There can be from time to time areas that we believe bolting on teams, early growth areas onto these platforms is a key focus of us, as well. Or another way of saying it, we rarely just purchase people one by one to start. In terms of our teams we may buy teams of people in the early startup.

So we will always keep looking for that but we have been a Company that has largely been organic with some of those smaller pieces added on. Those are going to be our two key focuses that we use in terms of our cash first. And then we focus in terms of our capital return process. Our capital return is very important to our shareholder value message. And that is a long-standing part of our business and will be as we go forward.

Steve Smigie {BIO 5514423 <GO>}

Great, well thanks a lot. We appreciate that.

Breakout session will be in Cordoba 3. Thank you.

Colette Kress {BIO 18297352 <GO>}

Thanks.