LANE JESSEPH: My name is Lane Jesseph. I'm a worldwide product manager with Lenovo. And you are here to talk about the future of mobile workstations and sketching, and kind of how we're blending some technologies that really haven't been blended before. We're going to do a discussion panel. There's no presentation, no slides to go through. I was really hoping to make this very conversational.

We'll go through, do some introductions up here, some backgrounds, let you get to know the panel a little bit. And then I'll just kind of be leading the discussion. But we really want to get feedback from you all. We do all of our work to create tools and create machines. We try to bring it all together so that you all can use it out there in the real world. And your feedback is very valuable for us.

For me, from a hardware perspective, features, functionality that we need in there, also for my counterparts up here, for their applications in the work that they do. So if you've got an idea, a question you want to ask, that's really why we're here to help you learn about this stuff. But we want to hear back from you all, so please don't be shy to jump in.

So as I said, my name's Lane Jesseph, worldwide product manager. We just announced P40 yoga. I'm not going to do a commercial on my product, but we did just announce this. Brand new for us. We've never really been in this space before. And really, the whole idea was behind the pen. And to bring the pen into a mobile workstation that allows the applications and the work that these gentleman do to give a new tool and work in a new way for you all, that we think is going to be compelling and very useful for you out there.

I've been with Lenovo for about nine years. I've been in sales, inside and outside sales. I've been out there beating the street. I've done product management in North America for a few years. And I've been in this role for about a year and a half. I love what I do. They pay me to talk about technology and travel, so not the worst job in the world. So that's my background. I'll turn it over to Don from Wacom and give you some background on him.

DON VARGA: Make sure is working OK. So I'm Don Varga. I do product marketing for Wacom. And before you hate me for that, I used to be a designer. So I can identify with what we do. It may surprise some people that Wacom has now been in business for 34 years, doing pen and touch technologies. We're here today, I think everyone knows, we have our own lines of products

that span the range from beginning artists and hobbyists, all the way through professionals.

But Wacom also supplies components to a lot of partners, including Lenovo. And they've put together some really great stuff. So if there are specific questions around the technology or how it's been implemented, we're here to answer those as well.

TOM VOLLARO: Thanks. I'm Tom Vollaro, senior product manager at Autodesk. My product is FormIt 360. So that was-- how many people are familiar with FormIt? OK, so it's a mobile 3D modeling application that we launched three years at AU on the iPad originally. And now fast forward three years later, now, you know the devices are getting fuller featured, in addition of really powerful stylus is allowing a lot more interaction of 3D and 2D design.

And that's kind of where my interest lies in terms of how these devices are going to be really changing how designers think, in a lot of ways, going back to traditional design. The pen is one of the oldest devices for design. And now we're able to bring that back but empower it with a lot of technology behind it. So that's my interest.

THOMAS HEERMANN: I'm Thomas Heermann. I'm also with Autodesk. And I'm in the consumer group at Autodesk. And I'm responsible for products like Sketchbook, Graphic, Pixel, and Sculpt. Of course, are there any sketchbook users in the audience? Thank you. Thank you for being my customer. So definitely curious to hear what you think of the product. We just announced Graphic a few weeks ago. Definitely a nice companion to Sketchbook more on the vector side. [INAUDIBLE] as well.

Sketching is definitely-- no, I'll say it differently. I got into sketching from being in a software product for a long time. So I remember when we had this product called Alias Studio, 15 years ago. This antique launched just this way. I started there in the business and really seeing it through from those $20,000 or $50,000 solutions to like you can buy an iPod touch with Sketchbook for half the price. So I think definitely it's interesting. So Sketchbook is part of what I'm doing on the creative side.

It's definitely seeing it through with the change of customers. Other people are using sketching now, because if you look back, sketching in the past was always like, either you have to be professional or you have to be a kid to sketch. Somehow we adults lost the thinking about sketching when we got older and matured. So it's kind of sad to see but also it's interesting to see about the trends that people actually do sketching again.

The tools are enabling it. There's an interest there, which is really exciting to see this technology. Of course, with the right hardware, now, to enable people come to fruition as well, because still, it's a creative angle. It helps people really unleash their creativity as well.

LANE JESSEPH: OK, well thank you, gentlemen. So again, we're just going to kind of drive some topics of conversation here. So if you've got feedback that you want to give us, if you've got a question, please feel free to drive in. But I'll kick things off. So Don, from a hardware perspective, you said Wacom's been in business for 34 years now. It's very impressive. But kind of how did digital sketching come about?

Was this a necessity that Wacom saw in the industry? Or was it just a turning point in the technology? Kind of how did this digital sketching idea come about?

DON VARGA: Yeah, I think the foundations of Wacom were quite obvious. Wacom was kind of the first company in the space and really tried to fill that niche where anything anyone wanted to do that was better done with a pen than a mouse, developing a solution for Mac or PC, no matter how people wanted to use it. And then through the years that developed in sophistication. The technologies branched out. Wacom added in multi-touch, both from an OEM perspective and into our products.

And it's the combination of those things and a lot of, I guess, capabilities that are being worked on that has really allowed the software to come along. So we've partnered with Autodesk for years, the Adobes, et cetera. When we first did pressure sensitivity, obviously, everyone had to build it into their applications. Then things like tilt, all of the productivity features. There's radial menus. There's express keys. There's all those things that don't do anything without the support of software partners.

So I think they've grown up together. They've grown up very naturally. They're all extremely based on what users are looking for. And that's how the range of devices is developed. Some people may not know this, Wacom actually makes things that translate sketching on paper. It sends it all up to the cloud. You can bring it down on any device.

We have very simple tablets. We have more complicated. We had Cintiqs. And we, too, have all in one computers. So the kind of full range of hardwares there.

LANE JESSEPH: Thank you. Thomas Heermann, was there a-- what Don was just talking about-- where the technologies have grown up together, the hardware and the software together. Was there kind

of a turning point from a hardware development standpoint that really allowed an Autodesk with the Sketchbook-like application to really take a big leap forward and start integrating some new feature and functionality that end users were really clamoring for but just couldn't be done in the past.

THOMAS HEERMANN: I See two major turning points. The first one was when Wacom introduced the Cintiq tablet. It's funny, from looking at the screen here and sketching there was definitely awkward. Sadly, more people got the idea of professional sketching, but more the professional side really seeing it as a part of their creative process and start digitally and sketching, and take it into 3D as well. It was a big change. And you saw a lot of more users jumping in as well.

But of course, the other key thing to bring to our core audience was introduction of the iPod touch, and of course, consequently to the iPad. They really brought a surface to people with their own stylus. Suddenly there's no tablet involved. There's no stylus involved. Suddenly, people can do these kind of things automatically. Of course, it was funny to see awkwardly you see these people on the small iPod touch zoom and pinching, which created a different sketching style.

These are the two things I see that really drove the adoption of sketching and brought sketching to a far bigger audience. And it's there. And you have it. It's a fun thing to do, of course. Then of course, connecting this to social media, suddenly you sketch and you can share. Suddenly, you are connected with the world. You're sketching in a notebook and it's all your own content, is for me the two breakthroughs I see on the sketching side.

LANE JESSEPH: OK great, thank you. Tom Vollaro, you had mentioned some 3D sketching that you were looking to bring Formant into. Where do you see that going in the future?

TOM VOLLARO: Yeah, so I've been working in CAD and BIM for 10 years now. And the mouse has been around-- there's a reason it's been around for so long. It's actually great device, right? It's very precise. But now, like Thomas said, being able to be right on the screen and being able to interact directly opens up a lot of things. And I think one of these I'm interested in is so the pencil is kind of a direct analog to the real pencil, pen. But I'm interested in where we can go beyond that analog to what we do with a stylus beyond just mimicking pens.

So for instance, we're looking at ways of while you're drawing a line, a little bit of extra pressure locks you into an access, for instance. So how can we use pressure in ways to do shortcuts, or things you might have done with another hand, or that you might have done with

a right mouse button or something like that. So I think that's kind of the next area.

And then the second one is our product still is very much CAD and 3D centric, but there's some other products that are looking at more gestural, in inferring 3D models from an actual gesture. And I think that's going to be the really next interesting area, where it's just like going from the 2D sketch to inferring a 3D model from that gesture. And we're just in the very beginning stages of that. So I think that's going to be kind of an interesting area.

LANE JESSEPH: So you're talking about getting into this 3D realm, is the hardware there today? Do we need something new from the hardware side of things?

TOM VOLLARO: Yeah, I don't know. This year, it's going to be really interesting, because all this stuff is coming out now. And I think, everyone's-- we still have to get our heads around it. We're just trying to figure out, OK, we've got how many levels of sensitivity, 3,200 or whatever? 32,000. What can we do with that? So yeah, ask me again in like six months.

LANE JESSEPH: Gotcha. Definitely trying to push the boundaries out there. Thomas Heermann, we talk a lot about sketching versus modeling, and kind of the lines that are blurring there. Could you kind of expand on that a little, and kind of where we're seeing those lines blur and how's that going forward?

THOMAS HEERMANN: Definitely, so touching back to Tom, as well, of course the 3D angle gives another kind of requirement on performance as well. So the hardware coming out these days is really supporting us getting the third dimension to have the fluidity of the interaction to really make sure you're working in these dimensions. The [INAUDIBLE], the iPad Pro, like really having performance behind this thing is interesting.

Sketching 3D is a long-- I won't say there for a long time. But people try to cure it. I think you if you're seeing the [INAUDIBLE] cracked the ideas a little bit more. The key notion here is it's either sketching or modeling. If you try to put them both together you get this hybrid which doesn't make sense much. If you can really preserve the sketching all the way to the 3D plot, then you can continue with the ease of use, and eventually engagements. If this becomes like a crutch to do 3D modeling, kind of, that you're already in CAD, which is a different paradigm, I think.

I would be interested to see experimenting with 3D sketching a lot, see those. We play also by using the pen not as a pen itself, but as a knife, you can do modeling, for instance, sculpting.

That's a good way to experience 3D as well. It's a different way to created 3D content. But definitely 3D is interesting enough to crack to see what's happening there.

LANE JESSEPH: You mentioned hybrids. One of our customers did a class yesterday on sketching in 3D and 2D. And he was using FormIt and Sketchbook. And one thing he did was he took a view, just a 2D view out of FormIt and then was sketching on it in Sketchbook. And he would set up the perspective using the two point perspective grid. And one thing we've been looking at is can we just take that camera data from the view, and then automatically set up that perspective grid for the user so they're immediately drawing. Because there's the extra step you have to do of kind of setting up that perspective.

So there's possibilities there of the hybrid where it's not so much 3D modeling, but can you draw on top of three models in a way that's intelligent. And obviously, there's 3D painting, too, which you guys are doing with Sculpt, too.

THOMAS HEERMANN: I think the perspective is interesting, because in 3D you have a perspective that's always there. 2D you don't. So we help customers to understand the perspective. We can match it together.

LANE JESSEPH: Right.

THOMAS HEERMANN: We just think and go from there.

LANE JESSEPH: Thank you, gentlemen. So collaboration, the cloud is big out there with mobility. We're certainly pushing the boundaries of mobility with the new device that we have out. Trying to make everything come together that these guys do. But something very interesting that Wacom is working on, the Wacom Ink Language Layer. You want to tell these folks a little bit about that and how that's going to allow, kind of, new levels of collaboration we haven't seen?

DON VARGA: Sure, in its simplest form, I guess, Wacom, as kind of the grandfather company in the space, does a lot of work in consortiums. So in all of the various pen technologies we have big global efforts going to standardize. And one of things we've been working on, its acronym is WILL, is Welcome Ink Language Layer. It's free. It's non-proprietary. The SDK you can get through Wacom for any developers out there.

But the vision is to have a common ink layer language so that moving anything done in ink between devices, there are no barriers, geographically, through the cloud there are no

barriers. So instantaneous collaboration on-- you could be using a Wacom Cintiq. And someone else could be on a Lenovo, someone else could be an iPad, you can actually all work on the same drawing, in real time.

So we're out there right now. And I think you'll start to see some adoptions around that. And it's a very interesting thing, because not everybody wants to own the same device, but people need to collaborate.

LANE JESSEPH: Yeah, absolutely. So just real quick from the audience, how many of you are using a digital sketching device now? A Cintiq? About a third of you? And how many of you are still sketching just pen to paper? So about half and half. So an interesting mix. So those of you that are using pen and paper, I'm just curious, is there a reason for that? You're just more comfortable with it? It's what you came up through school using? You're hesitant to get into the digital world? Why haven't you moved over to the digital world yet?

Yeah, please.

AUDIENCE: I mean there's something about the inertia between the marking device and the surface. On the screen, you can just kind of slide off. But with marking on paper, we're finding that, based on trace paper or something like that, it seems a little easier?

LANE JESSEPH: Is it the tactile feel between the stylus and the screen?

AUDIENCE: I think it's the fact that the screen is glossy and easy to move it across.

AUDIENCE: I think he's talking about friction.

LANE JESSEPH: Yeah, yeah. Friction, the tactile feedback.

AUDIENCE: [INAUDIBLE].

TOM VOLLARO: There's even a sound, you know, when you draw on paper, a slight sound you get. It's audible.

AUDIENCE: Beyond that, [INAUDIBLE].

LANE JESSEPH: Wacom makes a giant 27 inch Cintiq. Still not big enough? That's big. So that's interesting you bring that up, because that's something that we've worked with Wacom on to help address. So we offer-- we use Wacom's technology in our pen. We support the full 2048 levels of sensitivity. But we looked at different pen tips, and the different pen tip materials.

So we actually offer two different pen tips. What ships with the pen is as a palm, it's a plastic. Wears very well, but it does doesn't have that tactile feedback that a lot of people do like that you just commented on. We also offer felt. Felt has a much better feedback. It's got a much more pen on paper feel. And then on the screen itself, we're going to offer a couple different screen materials, if you will.

This is a glossy screen. The colors pop a little bit better. You get a little better contrast ratio. Digital artist love that, at least that's the feedback we've gotten so far. But it is a very slick material. So maybe felt on this is the right combination. Maybe you don't mind the plastic on this. But we're also going to offer an FHD screen as well that has a matte finish to it. So it'll have a little bit more of that grit as well.

DON VARGA: That's permanent? That's not an overlay, right--

LANE JESSEPH: It is permanent. Yeah, it's how you order it as well. I have seen third party options out there, that if you get the glossy screen and it's not what you want, I have seen some films that you can lay over there. Not tested or endorsed by us in anyway, but they are out there. So if you do order a machine that's got a glossy screen, there are companies that make films that you can lay over it as well.

So that's where we're trying to give you a choice to get that right feel that you want to help bring you in.

TOM VOLLARO: I wonder if people are just evolving, too. Watching these guys in Sketchbook in the lab yesterday, I mean, they don't seem to have any problem with drawing on the screen. And maybe it's just they've evolved-- it's that they're just adjusted their handedness to it over time. I don't know, and adapted. It's amazing watching them.

THOMAS HEERMANN: The key thing is the combination as well. You guys optimize the pen with the hardware. [INAUDIBLE]. Suddenly the optimization of two things together can give you this extra-- I completely agree with you. I think you want to be extra close to paper. This can really be possible now to be optimizing the software with the hardware. Because that makes a big difference for people who really do this on a daily basis. They don't want to have to figure-- it's just hardware.

DON VARGA: And there's a lot of things out there. I'll stay away from different brands for a minute, but Wacom has always offered four different tip materials. All the Cintiqs have etched glass. I've

seen Microsoft's done that now in their new products. Lenovo as well. So there is some getting used to it. But usually people can find a material combination they like. And then to me that the benefits of digital, while obvious, the productivity-- if you're really going to-- if the drawing is to do something more than help you think, is just off the charts.

I mean, scale it, warp it, change colors a million times, undo, all those things that on paper require another sheet of velum and another trace. They just go away. You know, especially if you work in vector, get the lines wrong, fix it, right? And so that that speed of iteration is off the charts, if that's the way you work.

LANE JESSEPH: Yes sir?

AUDIENCE: [INAUDIBLE] digitally, you often talk that if you do one, you put away the other one. I've found since the first iPad drawing that that's [INAUDIBLE] actually, that was my first reaction. But I still have multiple trace. And more and more they actually integrated. So what are your thoughts on how the new technology is going to change all that?

DON VARGA: So in my opinion, I mean, I think certain parts of that are learning, certain parts of that are on the software side. The closer a software tool replicates the pencil, a particular hardness that you like, and your shading styles, or whatever, the more realistic that experience is. But try not to plug a product-- I'm going to plug a product. Wacom just released a product called spark, which again, is a notepad that immediately digitizes you're drawing. And it does it very accurately.

And then it just sends up in the cloud and you can do whatever you want on any device you want, just because there are people who, whether it's a different type of drawing, whether it's just quick working drawings, engineering type thinking or whatever it is that you do, or its location, or sometimes you just want to draw on paper, you have that capability.

THOMAS HEERMANN: The key one has always been the napkins, so there's always that sketch anyway. Let's figure out a way to connect these two things together, so they can really be what they do, optimize them. And it becomes a work flow that actually makes things easier. Like can you do your overlays, but then can you get the overlays into the app, so it becomes a curve. You can modify the curve, which you cannot do on your paper face. So we need to embrace both and give you guys a far richer experience that goes beyond the paper or just digital as well.

LANE JESSEPH: Yes, sir? A question?

AUDIENCE: [INAUDIBLE]?

TOM VOLLARO: I mean, one interesting thing from the app perspective, I mean even Sketchbook is probably an early example of this, where the idea of mobile has always been, oh, it's got to be a very focused experience that does one or two things. And Sketchbook early had a lot of different pens and a lot of layers and in our app. And then three or four years later, now the devices are getting bigger, suddenly apps are becoming more full featured applications.

So I think whereas we may have held off from doing more 2D stuff, now I think about that as whether it's a side by side thing, or a full integration. We're definitely looking at that as kind of the next stage.

AUDIENCE: I mean, that's the part that I get frustrated with when I sketch, is that [INAUDIBLE].

LANE JESSEPH: Was there a question back there?

AUDIENCE: Yes, I guess my thoughts originally were if you're asking the question of why you're still sketching on paper, I think part of it is that sometimes you feel as though once you've made that jump into digital, you're almost committing to that. Whereas when you're on trace, you can sketch and throwaway in under a second. But you still always-- maybe you come back and you dig it out of the trash at the end of the day. I think there's something that's still very fluid about paper, where it's very down the middle, but you can also explore deeply from where you're starting.

LANE JESSEPH: That's great feedback.

AUDIENCE: There must be a lot of people now, working with different applications who have never used a 6B pencil, for instance. I'm wonder, do you see at some future point that the analogy to existing tools will disappear.

LANE JESSEPH: Since your app has 6B pencil mode. With the blue pencil and everything.

DON VARGA: OK, from Lenovo's perspective, I mean, I don't think we're ever going to see everybody using digital. There is something to your point that that analog feel it's just-- is always going to be preferred. And we want to draw as many people in as we can and give them the best possible experience. I think it's being adopted by a younger generation more readily.

AUDIENCE: The analog experience doesn't have to be tied directly that you're replicating a 2D pencil. You're creating a certain line width, character, flow.

TOM VOLLARO: Yeah. And that's what we're trying to do with all the applications and the Wacom technology. We're trying to bring all of that together and give you the best possible experience, as close to that analog, maybe better than that analog in some instances, as well.

DON VARGA: I would say, I mean kind of extending that topic, certainly there's a generational thing going on. We do lots and lots of user interviews and user studies to find out what people want. And especially on the more media, entertainment, illustration, character modeling side, I see people drawing in ways that, I think, are because they started digitally. And there's a lot of them.

They tend to build a character almost like they're sculpting it out of wire, like 2 billion lines. It's almost like a mess. And then you come back 20 minutes later and it's turning into this beautiful character. And I think the kids who've grown up on digital have their own drawing styles. And I think, for me, it's like Sketchbook is the throwaway. That is the instantaneous sketch that I won't have any commitment to.

But once you're in 3D, there's a commitment, because now it's more laborious. And I think the new applications, like FormIt, then start to blur that. Because now you can do very, very quick form modeling without any commitment, really. At least that was my experience with it. And use it almost like sketching. Here's an idea, eh OK. Here's another one.

THOMAS HEERMANN: This was the idea of the 3D sketching thing. [INAUDIBLE] into 3D, then I can make 25 forms, check them out, and then I can throw them away. Suddenly do you want to throw away three days of modeling work. That's a lot of investment effort. It almost goes back to the comment at the end, it's a mental model. Do I throw it away? Do I crumble this paper up and just throw it away or just do I save my sketch? It's a commitment level. It's mental more. I makes a big difference.

But it's also not the either, or, I would say. I think paper is there because it has an advantage. It's there. It's always there, unless there's a shortage of trees happening. And digital gives you different things. I would say, if you put your Starbucks on your velum, on your paper, you have a big ring on your paper. That doesn't happen on your iPad, you just wipe it away. Then there's the layers, there's the different brushes, the hardware we have. There's an airbrush we

have in the tool as well.

It's a different way of working, and a different way to interact with it as well. You can undo things. It's pretty hard to undo a paper. So it's a different way of working. And I think the new generation can understand these things in a better way. Of course, it's always training and you grow up with your iPad on hand all the time, it's your natural media anyways. If you grow up with paper, of course, it's a change of game.

LANE JESSEPH: So one of the reasons we heard, the apprehensions that we heard earlier was the tactile feedback, the feel. What are some of the other apprehensions or difficulties that are keeping you all from moving into the digital world? Yes, sir?

AUDIENCE: What kind of flexibility is there for the type of model that you can use, say Navisworks. My company's looking into doing that for, say, build engineers to go on ship. Use those models to sketch up dimensions [INAUDIBLE]. Take some notes on the rotating cloud, bringing that back to the office and using it. And even going so far as to take a 3D model and using that stuff. And I can see where using a pen would be helpful if you could do that. You know, with an iPad, you don't have a keyboar or mouse there with you when you're walking through the ship. Is there any way that you can use the Navisworks?

LANE JESSEPH: Does it run on Windows?

AUDIENCE: Or any other type of program.

TOM VOLLARO: Yeah, well that's a good point. It can run-- Navisworks on these devices now.

DON VARGA: Here you go.

TOM VOLLARO: Is that field ready-- I mean it's, yeah. Otherwise-- I don't know the exact answer to that, but I mean there's ways of-- I'm trying to think. We can talk afterwards to see if there's a technical solution. What I think, generally, what you're seeing, too now, is like with reality capture, when you can start to kind of capture the entire inside of this room, then you have the ability to say, well if I strike a line on the screen, I can actually measure that pilaster because it knows exactly the scale of the room based off the reality capture.

So then it's just a matter of, well, I do a natural gesture, such as a strike a line or do a measure, I'm measuring now real data to give me a real scale. So I think that's kind of where that's going to go.

AUDIENCE: We had some issues doing that just [INAUDIBLE]. And in 3D modeling you put some text in and you rotate, then you've lost it. Text stays with you no matter how you rotate it.

TOM VOLLARO: Well, I think you also need some level of like annotative overlay there. 3D text is probably not the solution. You need an overlay that-- And BIM 360 does this. There's a point in space that then opens up an overlay that has typed text, or spoken. So I think that's probably--

AUDIENCE: So Tom, you reminded me of something [INAUDIBLE] sketchbook for a really, really long time now that's really effective. One of the things you can do is take a picture and then start building a model off off that picture. So what he's talking about seems like that's a really good application [INAUDIBLE].

TOM VOLLARO: Right. Right.

AUDIENCE: Then you start sketching off that.

LANE JESSEPH: That's an interesting use case. That's something that we looked at from the hardware perspective with the new Intel RealSense cameras that are out there, in 3D capture out in the field, and then being able to immediately import it into an application and start working with it as well. The RealSense cameras just weren't quite there yet from an accuracy-- they could get down to, I want to say, it was a tenth of an inch, or something. They wanted it to the thousandth of an inch.

So from a hardware perspective, that's something that-- I built two of my chassis, the P50 and P70 to accommodate that. But that's in a full size notebook. Nobody wanted that. What they wanted was this, with a world facing 3D camera that could go into an environment, scan something, and import it into an application and immediately start working with it. So we're looking at something like that in the future.

And this chassis will probably be something that we might bring that into, that exact kind of use case. Yes, sir?

AUDIENCE: I have a sense of say the Sketchbook application of why does it even have to be tied into it's own application. Or why is it almost not like the application is almost like an old school layer of velum, where you can put that over top of any sort of current running program. Maybe you have a window of like a regular internet browser, and you just want to sketch something over in the environment. You don't want to actually launch the program. You just want to go straight

into drawing. You're drawing right onto your desktop or you're drawing an overlay on top of, say, Revit or Navisworks, or one of those type of systems. But not even having to get into the program itself.

THOMAS HEERMANN: It takes a 2D snapshot and then you start annotating whatever you want there.

TOM VOLLARO: I think he's saying there's no extra step, you just start drawing. Or the step is just, I pull the trace over the screen and then I start drawing immediately. Because there's always extra step of saying, File, Export, to PNG, then bring it into my other application. And there's that extra. Whereas in real life, you would just lay the trace over the drawing.

AUDIENCE: It could be as simple as basically almost like a sensor in the pen or a pen trigger or an annotative gesture, like pull down with two fingers or the pen. And it recognizes that as an action.

TOM VOLLARO: That's interesting.

THOMAS HEERMANN: And it's just software. Like if you hover over, we take a snapshot, we do all your operations for you inside your-- when your pen hits the screen, on the 2D cameras you can engage sketching.

DON VARGA: That's what I tell all my software developers. I say it's just software.

THOMAS HEERMANN: It's actually a use case I'm hearing a lot these days. It's really like help me to annotate-- it doesn't have to be complicated with 3D annotation in space, just a quick thing to have my context of what I'm looking at, and get me this to communicate out to people with changes, for instance.

TOM VOLLARO: Microsoft, I think, is doing that. I think the Edge browser allows you to mark up. And I believe, I haven't tried this, but it will go into, then, One Note. So they're trying to, I think, pull the drawing aspect into aspects of the operating system. So that's kind of an interesting area.

LANE JESSEPH: You can do that on anything online.

TOM VOLLARO: Oh right. Is that the Edge?

DON VARGA: Yeah, with Edge you can.

LANE JESSEPH: So any other feedback? That's really good feedback. And that's the kind of thing we love to hear because our brains start turning, you know. Hey, how could we do that? How would we implement that? Could we stick that-- is that an OS levels, an application levels, is that a background application that launches it, starts at boot up when you boot up the machine.

What are some other feedback like that that you guys have. Some feature functionality. This gentleman mentioned, the tactile feel's just not right there. Oh, I'd love to have this. Any other things that have been floating around in your head that you're like oh, if we could just get this in there, it would make my life that much easier. Any other things like that out there that you all have maybe interacted with an iPad or you've had a Wacom Cintiq in the future or in the past.

There's just something, that one thing out there, that oh, if it did x, y or z, it would just be that much better, or that much more useful, or that would get you into the digital world? Anything like that from anybody? Just not enough experience with it yet? Is it still too new? Yes, sir?

AUDIENCE: I think similar to the little trace, if you could scroll like [INAUDIBLE].

LANE JESSEPH: So like an infinite canvas.

AUDIENCE: [INAUDIBLE].

LANE JESSEPH: Yeah, I agree. A lot of the apps force you into a resolution or a page size. And I want-- I've always been looking for something like that, that just does infinite, so you could just sort of go and branch off and-- like an infinite white board kind of thing.

DON VARGA: Infinite zoom in, zoom out functionality.

THOMAS HEERMANN: You can easily mimic this, too. It could be sheets, too, but they're just tight.

TOM VOLLARO: Or you could crop it there.

AUDIENCE: [INAUDIBLE].

TOM VOLLARO: I was going to bring up the collaborative aspect, too, because back we were doing some stuff with Perceptive Pixel before Microsoft acquired them. And we were looking at, you know, they had the 27 inch-- I think they discontinued it. But like 54 inch multi-touch touchscreens are now getting cheap enough that you could have a table in studio, and then multiple people sketching.

And I haven't seen that that much. I mean, I've seen some customers rig up like that Kinect with a projector-- that on their table and they had like Grasshopper Graphs and Rhino that they were using it to do collaborative touchscreen there. So I think there's an interesting aspect, too, beyond just these devices, but the large format. And they're just getting thinner and cheaper the point where almost any surface will be digital, potentially.

And then that gets really interesting, because like in our office, all the walls are whiteboard. So then imagine if all the walls are digital, and all the surfaces. That could really open up and get beyond what you could do with paper.

THOMAS HEERMANN: But it goes beyond maybe to our first kind of question as well, is like if you [INAUDIBLE] mobile devices, like having infinite canvas, it's hard, because this is the capacity of the iPad or the Android tablet. And I can have five layers and this resolution. Suddenly, there's capacity there. So either these things actually are possible, or even on having a full-powered Windows machine with the right pen.

Sadly, I can't have the capacity to have endless canvas at the end, which is a really good note, or really think layer stacks, or whatever you want to do.

TOM VOLLARO: And it's always interesting to me how much the way you worked analog is your frame of reference, how you want digital to be. Do I want it to be a sketch book. Do I want this giant sheet of paper. We've actually built-- Wacom has just kind of for fun, we've built online infinite canvas and just invited people in to use them. It generates some interesting things.

But there's a-- you want to go back and forth this way. When I use sketchbook, I'll do a whole bunch of layers and I turn them off. So if I want to back and forth I look at them. I mean, obviously now you can even flip book. So you can go through and look at in animation if you want. But you know, you're horizontal, I'm vertical.

LANE JESSEPH: Anything else? Any other feature functionality that anybody's out there looking for? Anything? OK, one topic I did want to touch on real quick was something that I've learned about. And I even managed the product. There's different types of pen technology. And they have pluses and minuses. So if you're looking at various products out there, kind of which want to choose, which one's the best for you, and this one's for Don.

So the difference between the AES and the EMR technology, they're two different pen technologies. What's the differences there? Benefits? Pros and cons?

DON VARGA: Yeah, so Wacom is involved in both. In fact it kind of goes back to my consortium. So the one most Wacom products have been over time is EMR, electromagnetic resonance. And it does have some particular advantages. It's why there's no battery in any of our products, and you won't find a battery in the new Lenovo product.

What actually happens is the, essentially, the screen itself in this case, the digitizing board gives off the energy that excites the pen. So you can do stuff light transmit information through clicks, et cetera, et cetera. And you have a high hover distance. Can I say that that high hover distance has been used to its full advantage? No. But I mean, we've already come up with a use today.

In terms of where you are in hover, for those who haven't used the product, normally use it for mousing. So a lot of people who use Wacom products and use pens don't go back to mice for anything, Word, email, whatever. The pen has just become their mouse. And so when you float above the tablet or the screen, you're just mousing. Putting the tip down is like clicking a mouse button.

So it has a greater hover height. It has nice tilt recognition capabilities. And you don't never need a battery or a charging. AES is active electrostatic, which means that the pen itself has to be active. And so you need a battery, or for example, they new pencil from Apple you have to plug-in. And so you charge it. And I think you guys are shipping both, right?

TOM VOLLARO: We just do AES. We just do AES.

DON VARGA: But you have a capacitive stylus as well?

LANE JESSEPH: What's the one that's in the chassis?

TOM VOLLARO: Supercap. Supercap.

DON VARGA: Yeah. So you can do it either way. And they have particular advantages depending upon what you're trying to get out of it and how you're implementing.

LANE JESSEPH: Yeah, so a couple different technologies out. I manage the product. I didn't even know there were two different versions out there. So that was I was just interesting for me, because there are pros and cons depending on what your workflow's going to be, making the right decision and getting the better one out there. So we've seen this explosion in sketching devices lately.

Surface Book just came out. They're touting their pen that's out there. The iPad Pro is out there. We've obviously got our new notebook as well. Just curious to get more feedback. Are you seeing the devices out there that are compelling? Again, kind of what I was back to before, is there a device out there that has now dropped that barrier down, that's really compelling and willing to bring you in.

Cintiq's got a wide range, or Wacom's got a wide range of products, as well. But is there a hardware chassis that hey, Surface Book was just it. I mean has everybody looked at Surface Book? Is it-- I'm kind of seeing some nods and shrugs. Was that kind of the product for anybody, that they think they nailed it? I have to run out and buy one now? Show of hands? Anybody clamoring to go get one of those? OK.

What about iPad Pro? Obviously they've got a huge install base, wildly popular out there. Has anybody purchased one of those yet? No. I won't count these guys up here. Yeah, the pencil came out. It's interesting that Apple did a pencils. Pretty famous quote from a few years ago from their former CEO now that they've gone out to do it. So I think we're seeing a shift, where people are still very compelled to pen on paper. But the digital world is changing, it's growing, it's evolving, it's getting much better.

The functionality that I've seen in Sketchbook Pro, if you want to see some digital artists and what Sketchbook Pro can really do, come by our booth. Because what these guys doing is mind blowing. The capabilities of the applications that are coming in out there. And like I said, we're trying to take everything that these guys do and put it in our chassis to give you all the best experience possible.

So if you've got feedback, you want to talk more and see what we're doing, if you want to talk to these guys, we'll hang out for a few minutes here. But we really appreciate everybody coming by. Any other last questions or anything? Or last feedback before we wrap up here? We'll give you just a few minutes of your time back. But we really appreciate everybody coming in. Yes, sir?

AUDIENCE: I know Lenovo obviously takes the route of putting the tablet touch screen on a computer. Really that's the Microsoft style and the Apple style, that you're taking the tablet and computer are two different things. And I guess from a visual, sketching point of view and workflow, what are your thoughts on that philosophy or each of the philosophies?

LANE JESSEPH: Yeah, so that was really why we came out with this chassis, was we wanted it to be your sketching experience. That's where we teamed up with Wacom. They're kind of the name out there, certainly the most recognized. We wanted the best experience possible. So we took the best of what they had in the pen. We use their driver. We don't write our own driver. We use there's natively and just install it.

And then we also wanted it to be something that immediately flows over and lets you do your sketching and then immediately flow over and start working in your CAD application, in your AutoCAD or your Revit, something like that. And we thought this chassis, with the yoga hinge, we really wanted-- I wanted the technology to disappear in the workflow. I want you guys to just work, get your work done, have it be as natural and as fluid as possible.

And to do it all in one chassis was what we thought was the best combination. Give you the best pen so that, again, the pen disappears and you're just-- it's like you're writing on vellum. And we thought this was the right approach. So we'll see. The market will tell us. Your purchasing habits will tell us if we've got it right or not. So that's kind of Lenovo's approach to it.

DON VARGA: I would say there's a really, right now anyway, there's a big divergence, right? You have to make a choice there. And actually, these guys are on both sides. But I can tell you statistically, and sorry Thomas, Photoshop is the King of art applications. It won't work on your iPad, nor will Illustrator, nor will the rest of the Creative Suite, nor will many of the Autodesk, I mean, almost all of the engineering applications.

So forget about even pen performance and all those things for aside, you're committing to-- it's kind of strange because right now it's kind of a hobbyistic experience at a pro price. You're at $1,000 when you outfit one of those. So it's a different place. So most people, I think, gravitating towards iPads are buying them for that ecosystem. I'm doing-- I'm watching. I'm consuming media. Maybe I'm doing email, social media, that kind of thing.

You're probably not even in doing any business stuff. So it's a very nice device. Again, I own one. But to not have the applications I'm used to using, to not have all the shortcut keys that I use on my Cintiq Companion or any of my Wacom devices, you're asking too much if I'm trying to work. I need those things.

TOM VOLLARO: I think it's temporary. I mean, honestly, in my opinion I think what's going to happen is Apple's going to be forced into some point where the device is going to become more power-- it's

already becoming more powerful. So it's just a matter of time before the Microsoft system is going to force them to actually make more application-like experiences on there. That's my opinion.

But I think one thing we're doing is also-- and I know it's like count how many times an Autodesk person says cloud at AU-- but what we're trying to do is, like, for FormIt, we run on the iPad. But then we have a version of Revit in the cloud, that when every time you save a FormIt file on your iPad it goes up to a version of Revit in the cloud, and saves a Revit file.

So there's an example where you are not getting the desktop experience of Revit, but you're getting some of its power automatically. So I think that's one area where you're going to start to see. And then I have one other quick anecdote about the hinge. On the flight here I was obviously very space constrained, and a guy leaned back and I did not have enough room to type. So I flipped it around and used the stylus to write. So kudos on the hinge there.

I think with iPad Pro, the promise is really cool, one screen for everything. You guys are far closer to this idea, because you have the performance of the Windows, of the desktop, Which you still need it. I think Apple is thinking for more professional applications. But it will take time and of course, eventually there will be constraints. But one screen that's big enough to do everything what you need, is the right thing to do.

That's why I love my guys. I see moving to these things, because then they flip over, they be creative, but I can still tweak them and do other things as well on the side. I think that's the key promise. And if the performance actually doing these big things. The customers like that because then I can do Sketchbook and I can do Photoshop. Which I do together. That's the benefit of the work flow at the end.

LANE JESSEPH: Good. I'm glad it's making sense out there. That was certainly our idea. So we're just about out of time here. So if there's no more questions or anything, thank you, everybody. Really appreciate the interaction, the questions, the feedback, it was all great. Appreciate you coming out today. Thank you, everybody have a good day.

[APPLAUSE]