JIM CLAUSS: I think we're ready to get started. Good afternoon and welcome. Thanks for attending today.

My name is Jim Clauss. I'm a senior software architect working on Autodesk Inventor. I recently completed my 23rd year with the company and I've been working on Inventor since the beginning of the product.

The title of my talk today is "Providing Manufacturer Specific BIM Content for Revit from Inventor." First, I have some questions for you. Which of the models above are BIM content?

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: All of them, very good. So different types of BIM content are needed at different phases in the building process. Which one is easiest for a manufacturer to deliver?

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Yes, construction maybe. From my point of view, it's probably the facilities management version because its full level of detail required. It has everything needed to do maintenance and manufacture. It's typically the side of our products that we like to show off. Which one is a manufacturer's entry phase in the building process?

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: OK, somebody said documentation. Any others?

AUDIENCE: Design and development.

JIM CLAUSS: Design and development, OK. Three more left.

AUDIENCE: [LAUGHTER] Concept.

JIM CLAUSS: Concept. Two more left.

AUDIENCE: [LAUGHTER] Facility and management.

JIM CLAUSS: One more left.

AUDIENCE: [LAUGHTER]

JIM CLAUSS: So the reason it's construction is, in the first stages you're dealing with the architectural firm who's designing the building. And at the construction phase, the contractor, the construction professional, is typically looking for a specific product with a specific size. Prior to that, a generic product can be used for design and typically is. Often the architecture firm doesn't specify a particular product to be used in the building.

How does a manufacturer build BIM content from his product models? Well, that's why you're here today. That's what I'm going to tell you.

So at the end of this class, you will have learned, what BIM content and the Revit customer workflow mean to you, the building product manufacturer, how Inventor can simplify your products for Revit LODs, how Inventor can author Revit metadata or properties, how Configurator 360 helps customers view and select products from your website, and most importantly, how Revit customers can configure and download the specific Revit model they need for their building project. I'd like you to leave your questions to the end. My presentation is going to take about half of our time and then I'd like to have a discussion once I finish giving you my point of view.

Why do building product manufacturers need BIM content? This is Autodesk's view of the building products and fabrication industry. If you look at these different categories, you can probably think about where your particular product fits into this.

What we're going to be focusing on today is the building products and building equipment segments. Typically, what this means is, you have a detailed product in Inventor with a detailed model and you're creating a simplified model and it's going from Inventor to Revit to be placed as a discrete product in a building project. Custom fabrication is something that we're very interested in as well, but it's not a focus for today's presentation.

We understand that people in this business want to reference Revit models in their Inventor design context and when they're finished, or when they have the design ready for proposal, they like to be able to send it to Revit and be able to update that as their design changes. So how many people fit into the custom fabrication category, you might be using Revit and Inventor today? Keep them up, my product manager's still counting.

OK, probably about 15 or 20. Thank you. So I'm really interested in talking to you more about these and you have my contact information, jimclauss@autodesk.com. I'd love to talk to you more about your workflows.

So building information modeling is a digital representation of a physical and functional characteristics of a facility. It covers the entire building lifecycle from concept to demolition. You'll see that the operation and maintenance is a very long time in the lifespan of the building. So it's-- the facilities maintenance part is a key component and probably explains why a lot of governments around the world are starting to mandate BIM as a deliverable for their building projects.

So BIM is growing in importance and a lot of governments have begun to mandate its use. Mandates are already in place in Norway, Finland, Denmark, the Netherlands, this year in the United Kingdom, also in Singapore, Hong Kong, and Korea. France is working on their BIM mandate for next year and Russia is coming in 2019. The US GSA and the US Army Corps of Engineers both have BIM mandates today for their building projects.

So what is my definition of BIM content? Well, it's not just geometry, we've talked a lot about that already. It's also data. And often, data is as important or more important than the content.

It can also include intelligent connections for example, MAP connections to the building systems. And for the purposes of today's discussion, it's discrete products. An rfa is the extension for a Revit family, which specifies a single product. This isn't-- we aren't going to be covering layouts of different products or building systems. We consider that that would be best modeled as an rvt, which is a Rivet project that could be included in a master Rivet project.

So what are your options for creating and maintaining BIM content? You can build native Revit models from scratch in-house. You can import your manufacturing model into Revit as an SAT file, then use that imported model as a reference to build Revit features.

If your product changes, you can re-import it back into the BIM context and update or rebuild the Revit features to reflect the changes. Another option is to pay a third party, either a reseller or content provider, to build native Revit models for you. This requires you to send your models to somebody else and basically, they repeat the same process as above. Both of these steps require a lot of Revit expertise and can be time consuming if your product changes to get those changes reflected in your BIM content. However, if you have a product that's fairly unique to the industry, that may not already exist in a lot of architecture firms as generic content, you might want to take this kind of approach to build content for that situation.

You can also simplify and author your detailed model and then publish BIM content from

Inventor. This is something that Inventor has supported for many years. One of the limitations though, is it's best for single size or custom products, so its things that are custom for a particular building.

The fourth option, and this is new to Inventor in the last year, is to support configurable products. So you can do the same steps, simplify and author, but then publish your model to Configurator 360. This is what we've been calling the BIM content on Demand solution. What this allows you to do is upload your products to C360 and then the customer can see your products, configure them according to what he needs, and then download the appropriate BIM content that matches that configuration.

So how is BIM content used in building projects? So generic placeholder content is used in the design and approval phases. Often, this might be by convention or even by regulation.

Once the project goes out for bid, a contractor can visit your website. There he can find lots of information about your products. He can choose what options he needs based on his design specifications. Once he's done with the configuration part, he could take that information and, given that configured product content, he can download a Revit or IFC file and use that to replace the generic placeholder in the original Revit project.

OK, more audience participation. What differences do you see in these two models?

AUDIENCE: Level of detail.

JIM CLAUSS: Level of detail, OK, good.

AUDIENCE: [INAUDIBLE]

JIM CLAUSS: Yeah, one's shaded.

AUDIENCE: Origin?

JIM CLAUSS: Maybe, are you talking about this?

AUDIENCE: Yes.

JIM CLAUSS: OK, so these connectors are in different locations between the two products. That could be pretty significant in terms of, once you go into construction phase knowing how to connect to the product. The last difference that I notice, because I wrote the presentation, is this one's a

little longer. So the size isn't quite the same between the two because with a generic product you don't really know what the size is, but you can get a rough idea from a footprint.

So on the left as a generic model. On the right is a model for a specific or actual product. As I said before, generally speaking, for products that are pretty prevalent in the building industry the BIM content usually exists within an architecture firm in their design library. This particular model comes from the Revit content library that ships with the product.

The manufacturer, or content provider, provides a specific representation for an actual product so he has to go outside to find those. And then finally, as far as approvals and documentation needs, the one on the left is-- it's important that it's a poor documentation. And so, the approvals are based on not just the 3D model, but also 2D views and [INAUDIBLE]. On the right, typically the approvals at the construction time are not approving the model, but approving the physical model installation on the site and so documentation is less of an issue.

Is that right, Scott? OK, good. So what is LOD? So everybody in Inventor knows LOD means level of detail, but not in Revit or in the AC space.

Level of detail means level of development. So what that means, has some to do with detail, but you'll notice that the detail gets more and less as you go from one side to the other. Has more to do with what information you can trust at each point.

So at level of detail 100, you know you have a chair. And in 200, you know roughly what the size is. And in 300, you know its going to have arms and wheels so you've added functionality at that level. So the difference between 300 and 400, see that's where it transitions from a generic content to a specific product. That's where a specific manufacturer and model information is added and that's where the size goes from approximate to exact.

So there's an organization called BIM Forum. They've been working for the last decade or so. In the last couple of years, they've been producing and revising this level of development specification.

They defined a new level of development called 350. It enables coordination between the disciplines so it adds interfaces with other building systems, for example, supports and connections, which is important for between Inventor and Revit in terms of specifying things like [? MAP ?] connections. It's- like 400, 350 specifies a specific manufacturer model, but unlike 400, it doesn't have as much detailed information for detailing fabrication, assembly,

and installation.

These are some illustrations from the LOD specification from BIM Forum. So you can see the size differences and the shape differences between the generic content and the specific product. You can also see the details that are required to help communicate how this product connects to the building.

So throughout the building process, different levels of development are required in order to meet different functional requirements. What we're focused on, the point that our solution's going after, is that transition from design to construction, the transition from generic to specific. And just to summarize again, typically, the architecture firm has the content he needs in the early stages, but what the construction firm is looking for is that specific BIM content for your product.

OK, so let's talk about the steps that I need to create BIM content for my product. So starting with the configurable model in Inventor, this is the new BIM Content on Demand workflow as of R2 in 2017. Starting with the configurable assembly, create a simplified representation of that assembly. Then, you can add metadata. And This is important to help identify and specify your product for the Revit user.

You then upload that information to C360, which is a cloud service provided by Autodesk. You embed the C360 control on your website. Once you have your products and C360 running on your website, a construction professional can visit your site, find your product, configure it according to the needs of his billing specification, and then download Revit or IFC BIM content that matches the specification.

So let's take a closer look at simplify and author phases of this process. So the mistake that companies often make when creating content is they say, oh, isn't that beautiful? You can see everything. There was so much work that went into this, I just love it.

Unfortunately, the building professional doesn't have the same appreciation because he's trying to get a large building project done and your component is just one part of that product. You can imagine if all of the fasteners in Inventor had modeled threads what your assemblies would perform like. So what you need to do is remove and simplify a lot of this detail and produce something more like LOD 350.

You do that by first removing intellectual property. So this is something that we know that

you're concerned about. We want to make sure that you have the opportunity to keep the things that are yours, yours and not share those in the construction process.

You can also remove small and internal components and smaller internal features. Both of these aren't required at the scale. But while you're doing that, you need to keep the details that allow your product to connect to the building, if that's applicable.

So Inventor 2017, we support the simplifying model process by removing intellectual property and removing small or internal components. We also allow you to remove whole features. We're currently working on improving our model simplification. We've been combining Include Components with Shrinkwrap to improve the ease of use of that process. You can view or include components by size, by visibility, or by individual selection.

So if you have a rule that says, I want to remove everything less than the size, you can select a component and say, I want to keep that one. As well, you can remove now Fillet and Chamfer features. That's something we didn't have before. And you can select features to preserve. Similarly, if you want to remove all wholes, but keep a particular whole, then you can select that whole and say, this is important to me.

So we have a video of this process at the Autodesk Feedback Community for Inventor. This is our feedback forum for our alpha and beta customers. If you're interested in more information about this you can go there and download the video.

OK, so I talked about it earlier, it's important to minimize the file size. We talked earlier about how once that content, that manufacturer specific content, is downloaded from your website it goes into an existing Revit project. So you need to have the point of view of the Revit design professional.

They may have an already large project and they don't want it to get larger and slower as they replace their generic placeholders with manufacturer specific content. Bottom line, if your content is too big, it may not get used so it'll help your product get specified. If you do a good job at simplifying.

Next is metadata. This is the data that is so important to help identify and search the project and communicate performance, functionality, identity. You do that through adding properties to the model. Omniclass is a categorization that allows AC users to distinguish between different types of products. And so, you can look through the Omniclass definition and find the

Omniclass instance that matches your kind of product.

Orientation is something that's been a problem in the past. We think that we've got pretty good tools to help you out with this. So manufacturers tend to think about the world in a different direction than architects. And so, with architecture, z represents elevation and z is up. So just make sure that as you preview that your preview's correct, it has z in the right orientation.

So if you have MAP connectors for your product you can add them here. And finally, and this is not great in 2017, we're hoping we're going to fix this pretty soon, but if you apply changes that will save the data locally on your project. It's kind of obscure. Because typically, if you hit OK, you start saving an rfa file, which you don't need to do in the case that you're saving your configurable assembly up to C360. So use Apply Changes to save the data, and then exit the dialog.

All right, so how do I use Configurator 360 to provide my products on my website? So once you've uploaded your products and you've embedded the Configurator 360 control on your website, then customers can configure and download the BIM content that they need. Let's take a closer look at how to do that.

So Configurator 360 is a cloud service provided by Autodesk. It has the capability to do online CAD model configuration, integrate with existing websites, and provides multi-platform support. Behind the scenes, it provides all of these services and functionality that you see here.

So what C360 does is, takes all that technology and allows it to be reused across our customer base so that it doesn't have to be developed by each customer. So it's a simple way for you to get your products from your desktop onto the cloud to be selected by customers. So how does that work?

Starting with a configurable model assembly, in Inventor you use Upload to Configurator 360. All the files for your product are packaged and sent to the cloud. It's sent to a private file store as part of C360's cloud service.

You have control, as a C360 customer, on what models to download, what customers can see what models, and also, what form that content download looks like. There are a lot of online resources available to get started and to be successful with Configurator 360. I encourage you to check these out and there's also a 11 step YouTube video tutorial series that you can look

at.

OK, so lots of technology, lots of concepts, let's finally look at what it looks like in the product. First, this is your point of view as the building product manufacturer. So you start with a fully detailed model driven by iLogic rules.

Next, you simplify the model, hiding internal components and small parts and removing your intellectual property. If you need to author MAP connectors, you can do that as well. So you need to author BIM metadata as we talked about earlier, everything needed by the Revit professional to use a product successfully.

After you've done the simplification and author steps you can save your changes and upload to Configurator 360. Finally, you need to embed the C360 control on your website. OK, so that's what it looks like from your point of view. So you've got your website configured, you've got your website enhanced with the 360 control, you've uploaded the products to Configurator 360 to serve up products so that they can be viewed and configured.

What does it look like for the Revit customer? So he goes to your website, he finds your product among however you want to index them, he chooses the options for your product that you've exposed. So you get to choose which things are available to configure. They might be geometric or they might not be, they might be something else.

And as part of changing those options, the model changes dynamically and he could see a high DTL 3D rendering of what the finished product will look like. This is the fully detailed product that you uploaded, not the one that was post-simplification, but not as simple as you're going to see in an LOD 350. The Revit customer then, after he's configured the product, he chooses, for example, an rfa file that matches his project needs. At that point, C360 takes the BIM design view of that configuration and shrinkwraps it. So he removes even more detail and exports it to rfa.

Finally, the downloaded rfa file can directly be opened in Revit and you notice that a lot of the grill holes on those sheet metal covers have been removed. You can also see the metadata that you authored. OK, so how does all this benefit you and your customers?

From your point of view, you can build your own content without Revit expertise. You can build content in Inventor. You can provide your BIM content in the same place where you promote your products. So all the other collateral and promotion that you do, you can also have your

data ready for download.

You can update the content as soon as your products are added or changed since you control the publishing of BIM models. You can make sure that the next product release has all the BIM content ready. And if you're updating and making changes the models, the models are associative to the BIM content so you don't have to redo everything when you change the model.

The advantage for the Revit customer, he gets up-to-date manufacturer specific content and the appropriate level of development. He finds it in the same location as all the other information that you're using to encourage him to choose your product. And it's easy to configure for him and it's easy to download the BIM content that matches the design specifications for his project.

So I'm going to close with a success story from one of our customers who's implemented this. Vent-a-hood created a new configuration system on their website. It replaced an old 2D configuration system that's powered by Configurator 360. So one of the advantages that 3D gives over 2D is a lot better understanding of how that product's going to interact with the building.

So what are the results since they made the change? 28% more sessions, 24% growth in users, and increased requests for quotes. Here you can see the parameters that are used to configure Venta-a-hood's product line. So as you change these parameters change, for example, the air flow, the model changes from one to two motors. And you can change finishes, add or remove accessories, and the model keeps updating.

So it really gives the user a great idea of what they're getting at the end of the day. OK, that's the end of my presentation. So all those questions that you've been dying to ask, now is a great time. Let's have a good discussion and I appreciate your attention. Thank you.

Any questions? Yes.

AUDIENCE: About [INAUDIBLE] specific symbology, whatever uses that a lot in the architectural chain, you've got symbols. And obviously it's not [INAUDIBLE].

JIM CLAUSS: Right, exactly. So I tap danced around this question earlier when I was talking about documentation needs in the design phase. And so, we've talked about doing that. We've talked about designating sketches for 2D symbology, but in targeting the construction

professional, that documentation isn't as big of an issue.

So the 2D views are important for the design phase. If you have a product that you feel the Revit community doesn't already have that kind of product in their ecosystem, then it makes sense to go to creating a native Revit family with better 2D documentation. It's pretty difficult to map, in a good way, the 2D symbols. Yes.

AUDIENCE: How well doe these new tools work with the sheet metal parts?

JIM CLAUSS: I'm looking at my colleague back there who, we've exchanged a lot of email on some of the concerns about sheet metal. So it can have issues in terms of gaps where the seams come together. And so, we think that we need to leverage things like envelope, simplification, instead of trying to de-feature in the case of sheet metal because it tends to work not so well.

AUDIENCE: Right because it increases your face panel of sheet metal. And removing the [INAUDIBLE].

JIM CLAUSS: Right.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Right.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: So right. We're not there yet and we have plans to work on that very soon. Is that OK? More, more to add?

AUDIENCE: Yeah, I have [INAUDIBLE] I have a table. [INAUDIBLE].

JIM CLAUSS: OK, so what Nina was saying, just so the rest of you can hear too is, she's going to be manning a station in the idea exchange, which is an area outside of the exhibition hall next to our answer bar. And she would love to talk to you about ideas about how to do super model simplification. So we've done, made a lot of progress on that, but we know we have more to go and we'd like to hear more from you. Yes.

AUDIENCE: So as a [INAUDIBLE] management firm, how will you go about finding all the companies that use this? [INAUDIBLE] you have to go to each individual website.

JIM CLAUSS: Correct.

AUDIENCE: Would there be some sort of feature that centralizes it all and maybe get product or presentation based on your [INAUDIBLE]?

JIM CLAUSS: Maybe. We've talked about that a little bit. One thing that Configurator 360 isn't today, and probably won't ever be, is a catalog in terms of being able to find all of the manufacturers for a particular category. It's something that the Revit team is also looking at in terms of how does Autodesk make recommendations of products to companies.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Right. Right. So this should-- what this should hopefully do is help companies provide more information than SAT models for you to consume. Yes.

AUDIENCE: Yes. [INAUDIBLE].

JIM CLAUSS: No problem.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: So this is at the point where are you taking-- you've added some product or building element, you've tagged it with some additional information during the design phase.

AUDIENCE: Yes.

JIM CLAUSS: And as you're inserting a specific product in and replacing that element, you want to transfer the metadata from the design element to the construction element.

AUDIENCE: Yes.

JIM CLAUSS: Yes. Great. So I understand your problem and I've thought about it before, but I don't have a solution.

[LAUGHTER]

Sorry to say. So this is something else that I need-- sorry there's another tall person in here from Revit team- so it's something that we've talked about a little bit, but we haven't figured out yet.

AUDIENCE: OK.

JIM CLAUSS: A second question?

AUDIENCE: Second question, is it possible, or maybe in the future, to have in the C360 [INAUDIBLE].

JIM CLAUSS: OK, so I'm going to take that down. So we've talked about doing other mechanical CAD on the configuration side and transforming it to Revit, but we haven't talked at all about having Revit configurable modules in C360. I shouldn't say at all, we've had a conversation before about C360 potentially being a configuration engine for more Autodesk products than just Inventor.

And so, yes, that's another thing that we could do. It would require C360 to interface with Revit and that's, it's not quite so difficult, but it's just time. The technology exists, we need the will and the market as well.

AUDIENCE: And then my last question, with [INAUDIBLE] in my opinion, and correct me if I'm wrong, it can use the C360 [INAUDIBLE].

JIM CLAUSS: Yeah. I'm not familiar, as much familiar with Configurator 360 as I am with Inventor. And so, I think what that would take is a combination of Inventor being able to localize its user interface, which we should have, but I'm not sure, and for the manufacturer to create localized properties when they publish their data, right?

Or not just localize properties, but make sure that they provide all the properties required by the standard. And so, that part is more on the manufacturers themselves, but as far as localizing and making sure our interface is available in Dutch, I think we do that, but I'm not sure so I'd have to talk to the Configurator 360 manager about other languages that we already support.

AUDIENCE: We've got a few minutes.

JIM CLAUSS: OK, yeah I'm-- sorry, hang on just a second. I'm also going to be at the answer bar close to where Nina's going to be at the idea exchange. And so, I'll be hanging around that area if you guys want to hit me up the rest of AU.

This is my last really important thing to do. All the rest of it is nice and relaxed so come by, talk to me, love to talk to you. Go ahead.

AUDIENCE: I'm not very familiar with the Configuration 360. Could you walk me through the revision process? So a mechanical engineer makes a change on their product, I can see how it

updates Configurator, but if the [? art then ?] has to [INAUDIBLE] loaded into his project, or rather the project of [INAUDIBLE], how does he know that there's a change, how does he get the update?

JIM CLAUSS: OK, this is something else that we've talked about. So we put enough information in the Revit family that we know what manufacturer it came from and how to get back to the C360 that produced it. And what that would require is some kind of audit process to check to see if everything's up-to-date and then we could go out and we could know-- and I'm saying it could a lot and not, yes we do-- so we haven't implemented that. You may not want to, exactly. Exactly.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Right, so we're putting the breadcrumbs in there so that we can make our way back home, but we haven't started building tools in Revit to utilize that information. We also want to be able to do something like, hey, the specification changed. I need to update the product and choose something different. So I want to be able to easily go back to the website and choose the next version.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Ah, OK, I don't think so, but I don't know. In other words, does C360 support positional representations? Can it have a parameter that does open and closed? Now, it's possible that it does that, but I'm pretty sure that once you download to Revit you'd get one or the other, not both.

So Configurator 360 is basically an automation layer on top of Inventors API. And so, and-- as well as iLogic is also an implementation layer. Configurator 360 is implemented using a lot of iLogic.

And so, if you can encode in iLogic that you want the open and closed and then make that a parameter, it's likely that that parameter could drive into the model because basically we're going to pass that parameter off to the API and say, re-evaluate and it'll change just like a dimensional parameter. So it's probably there, I'm going to say. Yes.

AUDIENCE: [INAUDIBLE].

[LAUGHTER]

JIM CLAUSS: OK, so I think we'd have to build on what we were talking about earlier. If we wanted to allow you to change parameters from within Revit, including things like open and closed, we would have to-- and this isn't too far fetched-- but basically embed C360 in Revit, not just in your website, but also in Revit so that I could edit that particular piece of content. Up would come all the parameters, I could change it, it'd be computed, and it would be re-downloaded with that thing because all of Configuration, the trick for this, and I guess it's a trick, but to be quite honest, something that's really difficult is to take iLogic parameters, features, as well as features that Revit doesn't support, that doesn't need like Fillets and Chamfers. So basically trying to translate the entire recipe to build your product into a Revit recipe and download that is super difficult. That's why people get paid lots of money to do that for you, right?

So instead, what we've been doing is saying, no problem, configure here in this cloud service and then download the result. So we could make that process a little bit more embedded in Revit and say, edit the product, gets reconfigured and updated. Yes.

AUDIENCE: [INAUDIBLE]

JIM CLAUSS: I don't know how it can be done. And when you start getting-- I had really early on about windows and doors and native Rivet families, and this is a good example of something that we haven't implemented yet in C360, being able to communicate particular Revit templates with rules like that in them. So it's something that we could do going forward, but we haven't done it yet. Yes.

AUDIENCE: [INAUDIBLE] Is there a specific category that's assigned by people?

JIM CLAUSS: No. So I had said earlier to select the Omniclass. So by using the Omniclass-- so the category will be specified and then there's also a parameter, a property that specifies the name for that particular family. So that categorization is done in authoring time.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Yep. Other questions? Yes.

AUDIENCE: I was curious just by listening. Say you have a, you're building a building [INAUDIBLE] and you have all the panels [INAUDIBLE], but it's generic panels like a concrete with brick inlay [INAUDIBLE]. And then you go through the [INAUDIBLE] you're approved. Now you've got that manufacturing panels. I was kind of curious when I read [INAUDIBLE] where you're

manufacturer at that point would then take that [INAUDIBLE] but maybe this is actually not that type of situation.

JIM CLAUSS: No. So going back to this, I think what you're describing is this, for us in [? Inventerland ?] and BIM, this is our next frontier.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Yeah, so we've talked to a couple of customers today that are doing different products that basically they want to do some work in Inventor, some work in Revit. Some things in Inventor are precise and heavy. Some things in Revit are less precise and fast. So you might want to do your design or prototype, I shouldn't say prototype. I'm trying to say concept, that's what I mean.

You might want to do your concept here, but realize the fabrication in Inventor, maybe, or fabricate straight from Revit. That's possible too. But things like curtain walls or the type of panels you're describing or lots of other products that are-- we were talking to a customer today about bridges, that he was wanting to bridge design here, but also needs to deliver different documentation in Revit.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: Yep. So yes, right now this is what we do with C360, but we want to start working on this. And so, like I said, yeah, I'd love to talk to you more about this. What I'm doing at AU is trying to collect a bunch of customers, put them in my hip pocket, and then go talk to the people who make decisions about what I should do next and say, hey, look at this, we should do this next so please send me an email or find me. Yes.

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: OK--

AUDIENCE: [INAUDIBLE].

JIM CLAUSS: No no no no no. It's fine, go ahead and ask the questions. It's just embarrassing it's so bad.

So what we have today is the ability to import a Revit project, an rvt. And as you import that, it creates an Inventor part. Each solid body in Revit becomes a solid body and the Inventor part

and that's about it.

Unfortunately, I'd like to say things like, we preserve the name, that it came from Revit to Inventor and we don't, so it's really hard to use because everything's enabled solid body one to 1,000. And so, it's kind of hard to- you can use the data as reference, but it's not as selectable, categorized, identifiable as it should be, OK.

So what we'd like to do going forward, what we've talked about quite a bit, is the ability to take a Revit project, select by 3D view, select by type, select graphically what components I'm interested in, or what elements I'm interested in, and then import those into Inventor, preserve all the information, the identity information, and then if those change in Revit, update Inventor without having to delete everything and import again. So we want to do that, but again, give me your business card. I'll put it in pocket and take it back.

AUDIENCE: [INAUDIBLE]

JIM CLAUSS: I don't know. I think-- I don't have a great answer for you. I think that our customers are really resourceful and they use everything that we give them in the best way that they can and put up with a lot of stuff that we ought to support better. So excuse me, if that process is working for them, great.

Other questions? Everybody ready to get out of here and head to the bar or restaurant and have a drink? Yes.

AUDIENCE: [INAUDIBLE]

JIM CLAUSS: No, that's great. How many of you guys are familiar with the Iventor idea station? OK, cool.

So I'm going to do a shameless plug too. As far as this goes, that's another way that we can get more attention paid to fabrication. If somebody says, I want to reference Revit content in my models the same way you're able to reference third party CAD content and then it gets a thousand votes or maybe 80 or something, that would be great. So feel free to use the idea station. That's something that we're looking at all the time when we're doing our project planning and trying to figure out what things are the biggest pain points for our customers.

OK, so answer bar, idea exchange, we'll be there the rest of the week. You've been a great audience. Thank you very much.

[APPLAUSE]