MARTIN AMDAL: Hi everyone. Welcome. Hope you have some energy left. I'm late this day. We're going to talk about the project we are currently working on, the Bergen Light Rail Project. So we just included the class summary and the key learning objectives. I'll just skip past them right now.

So the Bergen Light Rail Project is, of course, a rail project in Bergen. We have done an ICT/BIM execution plan for this project. We are going to talk about how we do information development and the automated solution for federating models, and then reaching models with information. We're also going to talk about what we call Sweco BIM Cloud and Issue Tracker.

First of all, about myself, I'm Martin. I'm a senior engineer and BIM specialist at Sweco in Norway. In this project, I'm the ICT manager. Right now, I'm working in the project management doing designing processes and work methods. And Terje?

TERJE GLAD: Yeah. My first name is quite hard to pronounce in English, but you can call me Glad. And I work as a VDC specialist in Sweco, and my role in this project right now is as a BIM manager. And in this class, I will focus on the technology part.

MARTIN AMDAL: OK, just two words about Sweco. We are currently 14,500 employees in Europe, so we are the largest consultant in Europe in the [? AEC ?] business. In Norway, we are 1,300 people, 250 of them in Bergen.

So as you all know, we are currently here, in Las Vegas. This project is way up there in the Western part of Norway. So it was a long flight. Bergen is Norway's second largest city. It has 280,000 inhabitants. That's not a lot. It's still second largest city in Norway. Norway has a population of 5 million people, so it's a small country. Small and long.

In Bergen, we didn't have that good public transportation. It was bus-dominated, and we had lots of cars in the city center that we didn't want. It's an old city center, so it's tight streets, narrow streets, and you don't want cars in there. So in 2000, the municipality in Bergen, together with the county, decided that they would get a light rail transit system.

So Bergen looks like this. In the city center and inwards-- from the city center and inwards, you see the Bergen valley, and it's surrounded by mountains. So this makes it actually ideal for doing light trail projects, because the valley is only two kilometers wide. So we have all of the

population and commercial buildings and everything in a really tight or narrow lane, so it suits doing a line-based transportation project.

The project is constructed in different stages. So what you see the blue line here is Line 1. It's the existing stages. They're just one to three. It consists of 20 kilometers of double tracks, 27 or 28 stops. It's a lot of small bridges and even tunnels. Connecting the city center to the new airport terminal.

So this is what it's going to look like, when the new airport terminal is finished this spring. Right now, the tracks are in place, but the terminal hasn't opened yet. In the stage three, we also have constructed a depot and workshops for the trams in the area of around 80,000 square meters.

So what we're doing now, or what Sweco is doing now, is the orange line, Line 2. So we're starting designing that right now. We just did the [? soling ?] plan. So we haven't started the real design yet. We are hoping to start just now before Christmas.

But we had a lot of time to design the processes and the work methods in this project already, and also, we have done some development on the technology. So the second line consists of 10 kilometers of double tracks. It has seven stops, one underground station, in order for Norway's second largest hospital. We have almost half the project in tunnels, so it's five kilometers of tunnels. Sorry.

Just to give you an impression of what it looks like in Bergen, you have steep mountainsides. So this is a sketch we did in the soling plan, just to map out what one of the stations could look like. So this is done in InfraWorks, and using [INAUDIBLE] master rendering plugin, or the rendering tool.

So we're talking about the ICT and BIM execution plan. Just starting off, and just saying a little bit about our clients, it's a client that has a single purpose of building a light rail. It has around 40 employees. And of course, they did the first three stages. The first two stages was done in a traditional way, with delivering drawings and descriptions and reports.

But on the third stage, they were doing 3D modeling. So they had the requirement from the designers to do 3D modeling. It was [INAUDIBLE] in Ireland that did the 3D modeling. Did a great job. It was a large model, seven kilometers of tracks, and all disciplines in one model. It was Navisworks-based, and it was really smooth and detailed.

So in our contract, they had even more ambitions regarding BIM. So it was actually six pages in the contract that was dedicated to ICT or BIM in the tenders. And was lots of requirements that they had to do. They even included on an LOD, Level Of Detail definition.

They described the level for communication and collaboration. They really want a transparent project. So they need to be able to have a look at the models. They even have access to some of our files before delivering them. And also there was a requirement to establish and use the ICT/BIM execution plan.

So we spent a lot of time in the tenders doing this, and we won. And now it's a great thing, because all those requirements from the tenders is included in the contract, so we are actually able to do all the stuff that they wanted to do for years, making our BIM infrastructure project.

OK. So the ICT/BIM execution plan consists of eight different parts. We're not going into detail on all the parts. We'll go into some detail on some of the parts, starting with the BIM strategy.

TERJE GLAD: That is BIM strategy. When I started in the project, I started as a BIM strategist. So this is one of my responsibilities. And we divided the work with creating the BIM strategy into two different tasks.

So the first task was really to identify all the goals and purposes by using BIM in this project, and to do that we hired Autodesk Consulting. So they brought their team up to Bergen, and together with Autodesk, we had a review where we were going through all the tender document, the contract and all the descriptions.

We also had a interview with our client and with our project team and project management, and we found these goals. And so the goals by using BIM in this project was, first of all, to ensure the quality and the design solutions. For a second goal was to secure an efficient communication throughout the whole project by using BIM.

And we were to design a constructable solution. That means that everything that we are designing is going to be quite easy to build. And we are going to increase safety both during construction, but also when the project is finished, to increase the safety for the end users. And of course, we're going to use BIM to reduce the total costs of the project.

And our second task was to find out, how can we achieve these goals? And what we did, we tried to identify BIM uses needed to achieve this goal. I don't know if you have heard of or you

are aware of Penn State, but we used the BIM execution plan guide from Penn State. They have described most of the BIM uses.

And so what we did, for each goal-- this is within a region-- but for each goal, we create a description for the goal, saying, what's the purpose of this goal? And if you see in the table below here, we have tried to find all the BIM uses based from Penn State to achieve that goal.

And so what we did, we translated everything from Penn State, and we did some rewriting and reconstruction to make it fit within our project. And so this first BIM use area is actually existing condition modeling. And in the right field in the description field, you will see a description of what existing condition modeling is all about, and how we are going to use it in order to achieve our goal.

And I think it's also a really good thing to use the BIM uses from Penn State, because we could really use the strategy further in the execution plan. So you'll see that later on. All right, let's move on to organization.

MARTIN AMDAL: Yeah, so this was a part of the BIM execution plan. It's in a region. But you have lots of different roles. You have some roles that has to do everything with BIM, like the model owners and model authors. So they, of course, have responsibilities connected to BIM, and the BIM coordinators. But also, we have described different responsibilities for these high managers, for the discipline manager, and even at the project manager level.

So also, another part of the BIM execution plan was designing processes. So this is the highest level process. Of course, you have lots of sublevels or subprocesses that's describing what we're really going to do and the workflow. Also, you have a description of all the different processes.

TERJE GLAD: All right, let's move on. Next part is about structuring models. So as you have seen, this is a quite large and complex project. That means that we need to handle a large amount of data. And in order to do that, the first thing we did was to divide the project into different sub-areas.

So we divided this into three different areas, and within these areas, we have created some sub-areas. So when we are working with models, we are working within these areas. So you will see that we have one federated model for each of these areas.

And we're also working with different model types. So we have base models, which is existing

conditions. We have discipline models, that are the plan situation. And we have the interdisciplinary models, which basically is base models plus discipline models.

And I also mentioned model formats. As you will see later on, we are using iConstruct from Navisworks. And the model format, it's not really a big thing. When we were bringing that thing to Navisworks, the data will look exactly the same, if it's a DWG file or an IFC file.

So the different disciplines are using the format that they're best fit for their models. I have some examples of some models. This is one of our base models. We have our own survey team. So they have been outside doing some laser scan and doing some 3D modeling. And I will explain later how we can add information to these subjects.

And my next example is the architectural discipline model for one of our stations. This is a Revit model, contains a lot of information. And this is a section from our interdisciplinary model. This model is from our zoning plan project. It's basically where we are right now.

And this model is on LOD level 2 out of total five levels. So this model will get a lot of more details and information further on in the project.

AUDIENCE: [INAUDIBLE]?

TERJE GLAD: No. We will probably get back to that. But our client created their own LOD definition. Yeah. So we have LOD one to five.

MARTIN AMDAL: So you are awake. That's good.

TERJE GLAD: Next thing, this is our map showing the structure of our models. So if you see the green boxes in the middle, these are the interdisciplinary models for each area. And if we see on the first area, this model contains all the base models from area one and all the discipline models for area one. And we also have a Navisworks setup file that contains all the views and selection sets and all the set of things that we can do in Navisworks.

And we can, of course, assemble these three models into a federated model for the whole project. We will talk more about models very soon, on how we are using them. And the next part in the ICT BIM execution plan is about information exchange. So in this part, we are trying to explain how information is flowing between the different systems that they have in the project.

I don't think I will go into any depth on this in this part, but you can see that we are using Bentley ProjectWise as our main file storage and document handling system. It allows us to add information or metadata to the documents.

This is our main BIM production tools. So we are mainly using Civil 3D and Revit. And for BIM coordination, we are using Navisworks and InfraWorks. And you should also look on the Sweco BIM server or Sweco issue tracking and Sweco [INAUDIBLE] tools. I will explain that later on. Yeah. Let's move on to collaboration.

MARTIN AMDAL: OK. So Terje has been talking about the ICT systems. Of course, that's an important part of the collaboration. That's also the different work methods that we are going to use.

We're not going into detail on the ICE, or Integrated Concurrent Engineering. If you want to hear more about ICE, you can join Terje's session on Thursday. But we are going into some of the inter detail on Scrum and sprints, which is a software development method that we have applied for this project.

When it comes to communication, we are using a web page for the project. It's an internal web page. At the top, we are going to have 300 people working in the project. So spreading information is really important. And we also used that page to have information from the different users. And we'll get back to that. but we spread that information into the models, as well.

We also use projects offices. As I said on the top, we're about 300 people working on the project. The project offices has room for about 40 people. It's in our new location right next to the light rail, actually. So we have standard landscapes, but we have 40 seats for the project. And also, we have connected ICE rooms. So they're just in the middle of the landscapes.

Another part of the BIM execution plan is quality insurance. So what we do when-- of course, we have systems for quality assurance, when it comes to documents and drawings. That's boring. What's really hard is to do quality assurance on the models.

So we have all the models contained in ProjectWise, and ProjectWise also has the ability to have a state on the quality assurance. So we can set the state on quality assurance. And we are basing this on the web pages.

So we have a form on the web pages that you can connect with the models. So we can actually take information from the web pages and put it into the models. So you have different

states. The model author is going to go through the first two stages and then send the models-- or it's actually an automatic notification to the discipline lead that's doing the peer reviews.

And from then on, you have the inter-disciplinary review that the BIM coordinators are doing. What to add some information [INAUDIBLE]?

TERJE GLAD: I think you got it.

MARTIN AMDAL: OK, great. So that was all the eight different parts of the BIM execution plan. I forgot to mention, if you have any questions, it's probably best to do it in the end. I think we have some minutes left before the session is over. So we're going into information development.

So this is really an imaginary term of the information development in the project. It's not going to be like that in the real world, but it will do the purpose for illustration. So what this really means is that you have a linear information development in the project, and at the end, you do the quality assurance and the design reviews.

But it's not like that. We need to be able to control that information at different stages. So we introduced steps. So at each step, we have a decision gate and a delivery, and we need to specify, what is actually delivery on this step?

So we do that by applying a principle from Lean [INAUDIBLE] plumbing. This is actually an image from another project. I didn't have any images from [INAUDIBLE] project. But it's from a rail project in Oslo.

So it's a post-it-based system. It's really good. So you do the planning day-by-day, and you do task planning. So you say, what tasks are you going to do to achieve the actual delivery that you have on each step?

So we do the planning in teams. We have three different teams. Or actually, we have four different teams. The fourth team is doing the line-wide things like tracks and electrical and signaling. So each team has, of course, a BIM coordinator, and we are putting teams together according to the different challenges you have in the different areas. So each team is connected to each area that I was talking about earlier.

So when we are doing the information development, of course, you have-- at this level, you have different developments within the different disciplines. Because, at this level, we need rail or tracks to come really far, because they're setting all the-- or they're creating underlay for all

the different other disciplines.

So the roads, for example, need to have the exact height for the tracks to be able to design their roads. And in the end here, you see that landscape has lots of hours doing landscape at the end, filling in the blanks. And also, this could be, potentially, the hours that the different disciplines use. So this could also give great input for doing resource planning and scheduling.

Are any are you familiar with Scrum? Yeah? So to do the actually work planning, we're introducing sprints. So if you say that each step or each phase is probably three to 10 months, it's not that long. So each step is then four to eight weeks, and you probably would have several sprints within each step.

And the sprints are really-- it follows the same pattern. You have planning. You have design reviews. Of course, you have design. That's the most important thing. And at the end, you do sprint previews.

So to do this, during the planning, we're doing the task planning. So we have lots of tasks that are included in-- it's a Scrum term-- a backlog. And this backlog is contained within our project management tool, JIRA, that we're going to talk about later.

But also, in JIRA, we have design review issues. So combined with tasks and issues, you prioritize them and put them together in a sprint scope. So you put in the tasks and the design review issues that you need to actually deliver a product at the end of the step.

And it could look something like this, if it's going to be transferred into a weekly schedule. You have to do your initial planning on Monday. You do lots of design, of course. We have morning meetings, like 15 minute standups, if you have any obstacles, or just going through the project.

Depending on how long the sprints are, you could do several design reviews. We have automated federation models. So you could potentially do design reviews every day, if you want to. Yeah.

And then during the design reviews, we're going to use a tool that has been built for this project, which we call the Sweco Issue Tracker. And that, Terje will talk about that.

So to sum it up, this is what we are planning to do. As I said earlier, we haven't really started the design phases yet, so I'm sure we're going to make some improvements. But this is the plan so far. We did talk about the ultimate creation of Federated model or interdisciplinary

model, and also the project management tool. So Terje, you could take us through the technology.

TERJE GLAD: Yeah. Technology and our private cloud. I will explain how we are automating manual tasks, We are actually trying to automate the BIM coordinators, so that they can focus on the processes and the workflows and everything.

And we are doing some custom attribution. We are really trying to put the I back into the BIM. When working with transportation projects, we are working with models and formats that don't really handle information that well. So I will try to explain how we are adding information to our models. And we will try to show you the Sweco Issue Tracking tool that we have developed together with Autodesk.

So let's start with the mean lean BIM machine. Actually, this is our internal name. And in the class handout, you can see the specifications. But it's basically a computer. And we are using this software here. So we are using Autodesk Navisworks Manage, together with AutoCAD Script Pro. We are using iConstruct. That is a plugin for NavisWorks. It's really powerful.

So with iConstruct, we are assembling all the models, and we are also able to add information to objects with iConstruct. And we are using FME from Safe Software. I don't know if any of you have heard about it, but it's a really powerful tool, and it's basically about transforming data. So we can take whatever we want-- for example, a [? shape ?] file or a DWG file or whatever-- in [INAUDIBLE], and we can do a lot of things. It's basically [INAUDIBLE] programming. And so next page.

And this is what we are doing every night, or what our BIM machine is doing. And so every night at 3 o'clock, the BIM server will start to copy all the base models and discipline models from ProjectWise. Within ProjectWise, all the models have their states. So the BIM machine knows which of the models it should copy. So it copies everything to a local drive.

And when we are working with automating things, it's really important that all the units and coordinate systems and everything is in order. So for all the DWG files in the project, we are using AutoCAD Script Pro to control all the units and naming convention and everything. And for IFC files and other formats, we are using iConstruct together with NavisWorks to do the technical control.

And if the BIM machine notices that something is wrong, if a file has wrong units, it will try to fix

it. If it's not able to fix it, it will send a notification to the model author. And when we are working with transportation projects-- right there, now.

When working with transportation projects, we have a lot of discipline models that have some interface through existing train. That means that we have to create hole. For example, if we have a grading or a road, we need to create the hole in the existing train surface.

So all of the discipline models that have some interface through existing train, and then their models include train boundary lines. So FME will try to find all of these polygons, and it will add those as a hide boundary to the existing train surface. And that's really time consuming, so we are saving a lot of time right there.

And the next step is within IConstruct NavisWorks. We are creating one NVD file, or NavisWorks file for all the discipline models, and one NavisWorks file for all the base models. And in this step, we are also adding some information to the objects from different sources.

And then the second last step, it's also in iConstruct. It will compile the base models and the discipline models into a federated model. And the last step is to publish the models. So we are publishing the models both to Sweco Issue Tracking, which is based on the Forge Viewer from Autodesk, and we are publishing the NavisWorks files to ProjectWise. So then every morning at 5 o'clock, the project team will have the newest model.

The next thing I'm going to talk about is some custom attribution. So when we are using iConstruct, as you have seen, we can automate the assembling of the interdisciplinary models. But by using iConstruct, they have their [INAUDIBLE], and it's named iConstruct datalink. With that too, we can add information from a lot of different sources and add that to the objects in the models.

So right now, we are getting some information from Excel spreadsheets, and we are trying to transfer all the information from ProjectWise into models. So we can see, for example, the QA state for each object, for each model. We are also adding some open data from different web pages, for example, weather data and things like that.

And I will give you a quick example. It's actually from a PDC demo set. And here you can see an Excel spreadsheet containing some information. And on the right side, you can see the NavisWorks property tab here. So when we're using iConstruct, we can create our own tabs within NavisWorks.

So if you have a DWG file or a Revit file, you will have exactly the same tabs, whatever the models come from. And right now, you can see this object here just contained, or has a name and an element ID. And in this Excel spreadsheet, we also have the name and the ID. So this is the connection between the spreadsheet and the object.

And by using iConstruct, we are able to transfer all of this information back to the model. So after running the data linker tool, you can see now that all of the information from the spreadsheet is written into the PDC tab on the object in NavisWorks.

I think it's really-- you can do a lot of things with that, and we are basically able to write information from a lot of different sources. I think we have to move on to Sweco Issue Tracking, which probably is the most interesting here. So maybe you should introduce Issue Tracking.

MARTIN AMDAL: So early on in the project, we identified that we had some requirements to a model viewer, and we also wanted to include issue tracking capability to that model viewer. So we did a lot of research trying to find the right products, both from Autodesk, but also from other suppliers, without any luck, really.

So as we have an enterprise business agreement with Autodesk, we also have lots of resources available for doing both training on Autodesk software, but also doing development, if necessary. So we spent some of that resources, and Autodesk to help us create that solution.

So first of all, they had some guys from Autodesk consulting come to Bergen and help us setting up the requirements. Second, they did a team. So we got the project manager from Autodesk. We also got software developers and consultants.

So that was done, or the team was assembled in May this year. And also, we got help from our colleagues in Finland, in Sweco in Finland, because they had been using this project management tool, JIRA, for structure projects for a couple of years. So they had lots of expertise using JIRA to manage tasks through the workflow for different projects.

So what we thought was a great idea is to combine the latest model viewing technology from Autodesk-- the Forge Viewer-- with a project management tool. So in August, we had the first release candidates for the project management tool and the Sweco Issue Tracker.

At that point, we only had the ability to create issues in NavisWorks. So you could create issues in NavisWorks, but then you had to view it in either NavisWorks or on the web browser, but you couldn't create the issues in the web browser. So we took it one step further and asked Autodesk also that we needed to be able to create issues in the web browser using that model or model viewing technology.

So after a couple of workshops, we actually got that product now in November. So just before going to [? AU, ?] it was finished on a test platform, and we think that's really cool. OK, so let's try to do a demo.

TERJE GLAD: Actually, I talked with the development manager in Autodesk just before going here, and this is a cloud-based solution, which requires a connection to the internet, and the internet on the [? AU ?] is quite poor, so let's hope that this will work.

So we are really in NavisWorks Manage. We can run this tool on both NavisWorks Simulate and NavisWorks Manage. So what we have done here is basically to connect NavisWorks with JIRA and a web viewer. So I will try to show you how this works.

First of all, I can log into JIRA. And I have already done it, just to test the connection. But I just have to write in my credentials there. And when I have done that, we'll get the dialog, where I can select what model I want to use.

And so when we have this tool, the end users, they don't need to browse for any models. They will always have the newest model here. So they can select the models from the three different areas. And after that is done, it will copy the model from the cloud into the end user's local drive, and hopefully open the model.

We also have the issue list, which is all the issues connected to this model. And right now, I don't have that much issues or tasks. But if you have a lot of tasks, you can sort them by discipline or state or priority. So you can have a good grip of all the tasks.

And if I select a task, it will be marked in the model. So it will have a label. If I double click, it will take me to the current viewpoint that was set when the issue was created. And if I double click an issue, I will have the ability to edit the issue.

So I will go through the creation of issues, but I'm also able to edit the issues. And it's also role-based, so it's actually the discipline owner or the owner of the issue who is able to edit the issue. And for each issue, we have the ability to add comments, and I can also add

attachments to the issue.

And of course, all the information is the same, both in NavisWorks and in the web viewer, and inside in JIRA. So let's try to create a new issue. And I can just create or push the Create Issue button. I can select a category.

This is basically-- all of these fields are set up in JIRA. So I can add different priorities. I can set up the different disciplines, and I can set up basically everything within JIRA. I will go into JIRA very soon.

So I can create the title and add a description. I can set the priority, and I can assign it to a discipline. So let's assign it to us. I can write a recommended action. And by default, this will be assigned to the discipline owner, but I can also assign it to individual people in the project. And we can set the due date for the issue.

So I can now just click create issue, and I can click on an object. Later on, we can assign these issues to an area or to different things. But right now, we can assign it to either a point or to an object in the model.

So this is the issue that I just created. Let's move over to the web viewer. It looks like this. So this is based on Autodesk Forge. It's basically the same viewer that is used in Field and Glue and all of the BIM 360 products from Autodesk.

We have our own buttons there. So we have the issue list here. I will try to refresh it, and hopefully-- or [? AU ?] issue is there [INAUDIBLE]. There we go. And I think it's really nice to have this viewer, because this is the thing that all of our end users are using.

So for a technical manager in the project, it could be quite hard to learn NavisWorks. So they can just go into the web page, and they will always have the freshest model here. And the functionality within the Forge Viewer is quite good. So we basically have the most tools that an end user will use in the desktop version of NavisWorks.

So we have the model browser here. And what's really nice is the feeling when using this viewer, because it's easy to use, and the visuals are really good. So for example, when I'm highlighting the pipe model here, it will isolate it, and it's really easy to do a review. You can also set up sections and measurements and whatever we want. And all the settings from NavisWorks and all the properties from NavisWorks from iConstruct is the same within this

viewer.

As you see, this is still in a test environment. But very soon, we will have the ability to both create and edit issues within the web viewer. So right now in this version, I can only see the different issues and the tasks.

I can also, from this viewer, access our back end, which is JIRA. The end users, they wanted to use JIRA. It's basically the BIM coordinators and the BIM team and some of the design managers that will use JIRA. This is the same issue in JIRA.

So if I go there, it's number six. I can double click it, and we'll see that we have the same information in NavisWorks and in JIRA. And what's really nice with JIRA is that we have full control of all the issues. So here are all the issues for this project.

So we have here all of the same data that was created in NavisWorks. We have the description field. We have attachments. Let's find one with some attachments.

So here is all the attachment that was added in NavisWorks, and we have the comments. All of the tasks or issues have the comments, the work load, the history and activity. And with JIRA, we can now assign these issues to be solved either in a sprint or in an ICE meeting.

And also, when using JIRA, we are able to monitor everything. So we can create reports in our project office. We will have some screens that will give us some live reports on open issues and closed issues. So we have really good control of everything. Yeah. So I didn't have to use my pictures.

MARTIN AMDAL: OK, so to close it up and sum it up, we have-- I hope we have reached our key learning objectives. We have a couple of minutes left, so if you have any questions, feel free to ask. We'll stay here for some minutes after the session is over. Anyone have any questions now? Yeah?

AUDIENCE: Did you say that [INAUDIBLE] monitors like the [INAUDIBLE] office to monitor all the issues [INAUDIBLE]?

MARTIN AMDAL: Not yet, but that's because our offices are brand new. We just moved them. So we are actually going to have those monitors that gets the reports directly from JIRA, so we can see all the time we use to close issues and the different disciplines and everything. So make it a competition. That's a good thing. Yeah?

AUDIENCE: Basically, you used Force to push the [INAUDIBLE]? It's not sitting on a public cloud, like [INAUDIBLE] 360 or--

TERJE GLAD: We are using Microsoft Assure to store all the models. So we are using the Forge model API to publish the models to Assure. It's basically a cloud storage. Yeah?

AUDIENCE: So why not use Glue and Field? Why use this as a [INAUDIBLE]?

MARTIN AMDAL: Why we're not using it? Yeah. We did some research on Glue and Field. Field is really not that customizable. You have all these different attributes that you have to use all the time. You can't change names and everything. So that's why we ruled out Field.

With glue, you don't have the ability to pinpoint issues to exact coordinates, or something like that. You don't have the product management tool in the back end. So we really wanted to take this one step further. So we found that Glue didn't have the capabilities that we wanted. Yeah?

AUDIENCE: When you input data with iConstruct, is that only for the aggregate models in NavisWorks [INAUDIBLE]?

TERJE GLAD: No. We are not able, or we haven't tried to, because we are thinking to, for example, bring back information to Revit, or to a Revit model, or to the Civil 3D model, and we are not doing that yet. So it's only the NavisWorks files that have that information.

But what we could do with iConstruct for NavisWorks is that we can export both IFC files and DWG files. So we are, in some way, able to bring information into DWG and IFC files. Yeah. Yeah, please.

AUDIENCE: In the automation you were talking about before, is part of the automation taking the native files and making them into [? NWE, ?] or do the users still have to make--

MARTIN AMDAL: No.

AUDIENCE: [INAUDIBLE]. Like the Revit file [INAUDIBLE] your other file [INAUDIBLE].

MARTIN AMDAL: No, we are using the native formats, mostly. So at least for Revit and Civil 3D models. They don't have to do anything, because that's really time-consuming, when they have a smart model, and they have to do a dumbed-down export. So we are trying to avoid that.

AUDIENCE: Do you [INAUDIBLE] to get local view. Cause it seems to--

MARTIN AMDAL: Like the other way around?

AUDIENCE: Trying to [INAUDIBLE].

MARTIN AMDAL: Yeah, that's true. So we have to have both JIRA and [INAUDIBLE] open at the same time. So no, we haven't thought about that. But what we are going to do is that you get the viewpoints from creating the different issues into JIRA, because you can append files to the JIRA issues. So that's one of the tasks that they're going to do before finishing the test platform for the issue tracker. Yeah?

AUDIENCE: Has issues in-- when you create an issue, it has nothing to do with the clash detection you can make in NavisWorks? It's a manually-created issue?

MARTIN AMDAL: Yeah. You could, of course, use the issues from the clash detections to create issues. But we don't have an automatic creation of JIRA issues, because you have to have some overview of all the issues You create in the clash tests before actually handing them over to a project management tool, or else you could have thousands of different clashes. Yeah.

TERJE GLAD: So the normal process is that we are doing the clash detection, and in the design review meetings, we are validating the different clashes and creating issues and/or tasks for each clash.

AUDIENCE: Can you solve the issue by anything other than the name? Like you're having three different areas, can you sort it by the discipline?

TERJE GLAD: Yeah. We can set up different categories, and we can add more fields here, as well. This is just custom fields within JIRA, so we can have whatever we want.

MARTIN AMDAL: It's actually not in yet, but we are having areas put into this, and also sprints. So you can assign issues to a specific area. But then again, this is really customizable. So if you want any different attributes, we can just do it later on. Yeah.

AUDIENCE: And can JIRA be accessed other than people from Sweco?

MARTIN AMDAL: Yeah. You can have external users. So we're working with some sub consultants. So we have four different partners that we are doing the project with. So they have full access to everything. It's one of the main reasons we did this, because we want everyone in, and also

the client, of course.

TERJE GLAD: The other question?

AUDIENCE: Did you consider [INAUDIBLE]?

MARTIN AMDAL: Well, yeah. We did consider Volt. But that was really not our decision, because we had an agreement with Bentley on using ProjectWise for large infrastructure projects. So yeah.

TERJE GLAD: And we already had ProjectWise set up in Sweco, so we had our own ProjectWise environment in Sweco.

MARTIN AMDAL: So it was really an easy decision to make. Anything else? OK. Thank you so much for coming. So enjoy your evening, and thank you very much.