



AUTODESK UNIVERSITY 2013

Revit API Expert Roundtable – Open House on the Factory Floor

Jeremy Tammik – Autodesk

DV1914 Interact with a panel of Autodesk Revit API experts from Autodesk to get answers to your questions and discuss all relevant topics of your choice. If you are writing add-ins for Revit software, then this is the perfect forum to get to know better the people who shape the APIs you work with and to explain your views, ideas, and problems directly face-to-face. Note that prior .NET programming and Revit programming experience is required and that this class is not suitable for beginners.

Learning Objectives

At the end of this class, you will be able to:

- Interact with a panel of Autodesk Revit API experts
- Ask questions and discussed topics of your choice
- Get to know the people who shape the APIs you work with better
- Explain your views, ideas and problems directly face to face

About the Speaker

Jeremy is a member of the AEC workgroup of the Autodesk Developer Network ADN team, providing developer support, training, conference presentations, and blogging on the Revit API.

He joined Autodesk in 1988 as the technology evangelist responsible for European developer support to lecture, consult, and support AutoCAD application developers in Europe, the United States, Australia, and Africa. He was a co-founder of ADGE, the AutoCAD Developer Group Europe, and a prolific author on AutoCAD application development. He left Autodesk in 1994 to work as an HVAC application developer, and then rejoined the company in 2005.

Jeremy graduated in mathematics and physics in Germany, worked as a teacher and translator, then as a C++ programmer on early GUI and multitasking projects. He is fluent in six European languages, vegetarian, has four kids, plays the flute, likes reading, travelling, theatre improvisation, carpentry, and loves mountains, oceans, sports, and especially climbing.

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Panelists

- Angel Velez, Revit Development
- Augusto Gonçalves, ADN
- Jeremy Tammik, ADN
- Miroslav Schonauer, Autodesk Consulting
- Scott Conover, Revit Development
- Sasha Varsanofieva, Revit Development

Learning More

- Revit Developer Center: DevTV and My First Plugin Introduction, SDK, Samples, API Help
<http://www.autodesk.com/developrevit>
- Developer Guide and Online Help
<http://www.autodesk.com/revitapi-wikihelp>
- Revit API Trainings, Webcasts and Archives
<http://www.autodesk.com/apitraining> > Revit API
- Discussion Group
<http://discussion.autodesk.com> > Revit Architecture > Revit API
- API Training Classes
<http://www.autodesk.com/apitraining>
- ADN AEC DevBlog
<http://adndevblog.typepad.com/aec>
- The Building Coder, Jeremy Tammik's Revit API Blog
<http://thebuildingcoder.typepad.com>
- ADN, The Autodesk Developer Network
<http://www.autodesk.com/joinadn> and <http://www.autodesk.com/adnopen>
- DevHelp Online for ADN members
<http://adn.autodesk.com>

Notes

This session was recorded. We will publish the recording anon.

Here are the notes from the questions and answers discussed in this roundtable session.

[q] modify visibility of linked files per view?

[a] currently no api access.

[q] modify selection from a modeless context, how to update view?

[a] check it out in UR2, it should be fixed.

[q] revit materials. when i try to read bitmap from asset, the bitmap path in the asset property is not consistent. for some materials you can access the full bitmap path, but sometimes there is no entry for the bitmap itself. is there a better way to get the bitmap from materials?

[a] going forward, we definitely are looking at better access to material asset info.

[q] revit api preview window to display sheets will not dynamically update when we change sheet name or number, so we have to create a new sheet in order to force it to update. part 2: preview window. will it be made more dynamic?

[a] i am not aware of any such issue, please report to ADN, we want to hear about this. post it on the forum so we can track it. we will research and submit an issue if needed. part 2, improvements: we can discuss a little more what you are looking for. some of our exports use the preview window, you can toggle things on and off, we need to hear what you need.

[q] acad has COM + .NET interface to access from outside, open and close documents and start up and shut down autocad. is this possible in revit?

[a] we do not currently have that. use the external event mechanism instead.

[q] i have an app that opens revit and configures worksets. it crashes now and again and the problem is reproducible. response: it only happens when you are using revit server, and the api is not fully supported for that.

[a] the api should support that, there are no limitations for revit server.

[q] working with schedules and accessing a parameter from schedule or from an element there is a difference. the id is the same. wanted to distinguish between a project and a shared param with the same name.

[a] element ids are used to represent elements, parameters and categories. for params, the id may be negative, e.g. bip, or non-negative, custom or shared. when you call get element on that id, it returns the parameter definition. probably that object does not have an exposed subclass in that context. there is difference between newer and older environments, and the schedule api is newer.

[q] use cut and paste api to import new sheets. the DuplicateViews SDK sample does drafting views and schedules. any advice for sheets?

[a] the mechanics for sheets would be the same. probably best to copy them together, because then revit can do an optimal job of maintaining relationships. bring in the empty drafting views and settings all together. DuplicateViews demonstrates these two steps.

[q] any plans for enhancing this?

[a] it is already perfect. revit uses it internally also.

[q] non-technical: collaboration between dynamo and api team?

[a] there is a group of dynamo guys all around us, they are in the same office. we try to expand revit development in all directions.

[q] purge all. any chance of exposing that, purge unused?

[a] who needs a purge api? lots.

[q] convert an element from linked file and put them into the host document. can i do that?

[a] copy monitor approach lets them remain in the link, and the copy paste api can bring them in properly. use copy paste and then delete the linked element. that will require unloading it. depending on what element you ant to bring over, it may run into problems trying to separate it from its relationships. it might bring it in with the right shape. otherwise you might need to read boundaries and recreate it. if you bring it in as is it will be looking for sketch curves in the wrong place.

Revit API Expert Roundtable – Open House on the Factory Floor

[q] macro ide. structural company, little api programs passed out to customers, using macro to transfer to customer, but it is not so simple. to transfer macros to customer it is a bit more complicated.

[a] you could use the python shell. why not make it an external command and send the dll? then the user does not have to touch anything. you can embed the macro in the model, and then there is no code to transfer. the macro does actually generate a mini little hidden DLL that you can transfer to the customer.

[q] add-in existing with a project. can they be bundled?

[a] only macros and dynamo scripts. the exchange store is actually the most official avenue. we are interested in people sharing code, but it also worries some. you have many options.

[q] furniture in revit families including 150 types. easy way to create blocks of every time. create a symbol library. can that be done programmatically?

[a] yes, simple to solve, has been published.

[q] reload the keynote file?

[a] yes, we are looking at that for the future. right now it can be solved using an autohotkey script. in 2014 you can also post the command.

[q] can i access the revit line pattern from a revit style? line weight is available.

[a] augusto wrote a code about that a few weeks ago. you have to search the assets.

[q] create or control underlays in a section view, like the ones you have in plan view? structural engineering in chile requires you to show the projected elements in front and behind. underlays in the views would solve this.

[a] probably not exposed. that is a good request to make. we have 11500 methods and classes, we do not always know. augusto saw a solution involving moving the selection a bit. this is not api functionality, but basic revit platform functionality expansion request, been requested for ten years.

[q] extensible storage available in families?

[a] yes. there is a sample that demonstrates this in the original estorage au materials.

[q] basic file info, transmission data. can a few more areas be opened up, e.g. view sheet list? now i have to open the file, export the view list, close the file.

[a] yes, that is the current approach. file a request, please.

[q] furniture geometry has a huge amount of unique vertices. how can i reduce that? i need it for a webgl viewer.

[a] revit is good at optimising. something is curved. revit likes to triangulate things. there are some knobs that you can use to turn down the triangulation. ifc uses the solid tessellation routine added in 2014. if you are exporting solids, take a look at that. the normal tessellation routines do not line up adjacent faces. doing the whole solid in one go is better. another approach is the custom exporter. then you do not need to think about each element.

Revit API Expert Roundtable – Open House on the Factory Floor

[q] document changed event tracks changes. how do i know exactly what changed, and what the old value was?

[a] you have to cache all the values of interest beforehand. we have a similar request around what was deleted.

[q] dual monitor support, how can i take some things outside of the revit window? it seems to work on autocad.

[a] you can create a modeless dialogue, attach it to the revit parent window and drag it off the screen.

[q] single core. multicore machine. how can i know what thread revit is using?

[a] the windows processes can be queried. look for the revit.exe process and the .NET Process library. this is windows api, not revit api.

[q] some params have type of colour and bring up a dialogue when the user edits them. can i create a shared param to store a colour as well?

[a] revit implements some parameters that map to custom behaviour and launch dialogue. this is not accessible programmatically.

[q] can i raycast onto a non-planar surface?

[a] the ReferenceIntersector ray cast utility can be used, but only ray by ray. the extrusion analyser only goes onto a flat plane. you could make repeated calls to the extrusion analyser call for each facet of the tessellated surface.