AUTODESK UNIVERSITY

BU18239

Useless or Priceless? How to Prepare and Use a BIM Model for FM and Building Ops.

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Brasoftware

Learning Objectives

- Discover the information in a BIM model that is valuable for FM
- Learn how to prepare a BIM model for FM
- Learn how to integrate Revit and Building Ops
- Learn how to use Building Ops to operate your building

Description

Have you ever considered that all the efforts to build a Building Information Modeling (BIM) model are wasted when it comes time for facilities management (FM) if you don't use your model to help the operators of the building? Do you have any idea of how to use your BIM model for FM? Do you know that Building Ops plus BIM 360 Field software plus your BIM model can help you save a large amount of money if you actually use the BIM for FM? If you don't have a clue of how to start thinking about integrating BIM and FM, this class will help you solve all these questions. This session features Building Ops and BIM 360 Field. AIA Approved

Your AU Expert(s)

Tiago Ricotta is an architect and urban planner. He has a master's degree in planning and technology and a master's degree in business administration, project management professional (PMP). He received a Technical Highlight Award for Creativity and Innovation from Autodesk Brazil, and he has 12 years of experience (since 2004) in the architecture, engineering, and construction market. Today he is a project manager at Brasoftware Informatics, where he is responsible for the technical management and delivery of Building Information Modeling (BIM) implementation projects for the company. Ricotta was an Autodesk Revit Gunslinger 2014 event participant, an Autodesk University Las Vegas Speaker (2012), and an Autodesk University Brazil speaker (2013/2014/2016), and he is an Autodesk Revit Certified Professional. He was the technical responsible for the first LATAM BIM 360 Field software enterprise agreement contract and implementation.

Discover the information in a BIM model that is valuable for FM

Before we start this one-way journey to the great and huge world of Facilities Management, have you ever thought about how many BIM models were built in the past few years while BIM were gaining the market?

Have you ever thought that these models, after the construction, are now stored in somewhere in the data center of the design firms and the guys that are now managing the building are doing this in the conventional way having no access to that model?! Or having the model, it is being used only for looking after the 3D?

In other words, the BIM models helped the design and construction teams to get BIM benefits but now it is a useless information for the FM team. Ok, useless is a strong word but we need this kind of sensationalist news to make people pay attention on this issue… and here you are reading this paper, so I think I have point.

Also, why should we pay more attention on what happens in the operation of the building? Simple, take a look in the image below:

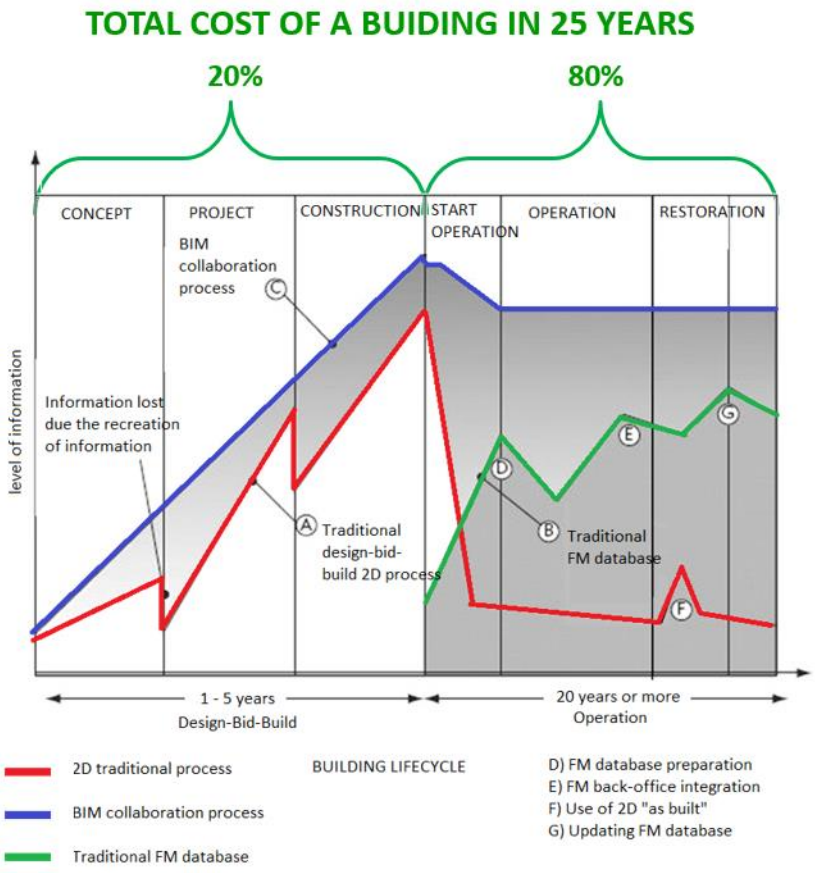

Fig. 1 - Potential FM application areas that BIM can be used for

It is all about money. If 80% of the total cost of a building it is spent in the operation why we put all the efforts of BIM in the design-bid-build process?

Because the barrier to enter with BIM in the FM world is huge, and it is not me that is saying that, it is the guys that works operating buildings that say in a great research made by Burcin Becerik-Gerber / Farrokh Jazizadeh / Nan li / Gulben Calis (link for the paper here):

- Barrier for the implementation of BIM for FM:
  - Unclear and invalidated benefits of BIM in ongoing FM practices (for example, unclear productivity gains, or benefits gained from reduced equipment failure and better-automated building energy usage);
  - Amount of work that needs to be done to define the specific FM needs for which a model is necessary and how that model may need to be prepared to meet the needs;
  - Lack of interoperability among BIM solutions and between BIM solutions and FM systems;
  - Lack of demand for BIM deliverables by the owner community due to the uncertainty about what BIM might be used for;
  - Lack of clarity about responsibility in insurance and contracts;
  - Lack of standardized FM tools and processes; and
  - Facilities management personnel's limited experience with BIM technology.

So, now that you are reading this paper what can we do to prepare the model for the use of the FM team and try to explode this barrier of BIM in the FM world?

Useless or Priceless? What kind of information is important?

First of all, we need to know what the FM team wants to see and use the BIM model. In the same research made by Burcin Becerik-Gerber / Farrokh Jazizadeh / Nan li / Gulben Calis[1] they tell us:

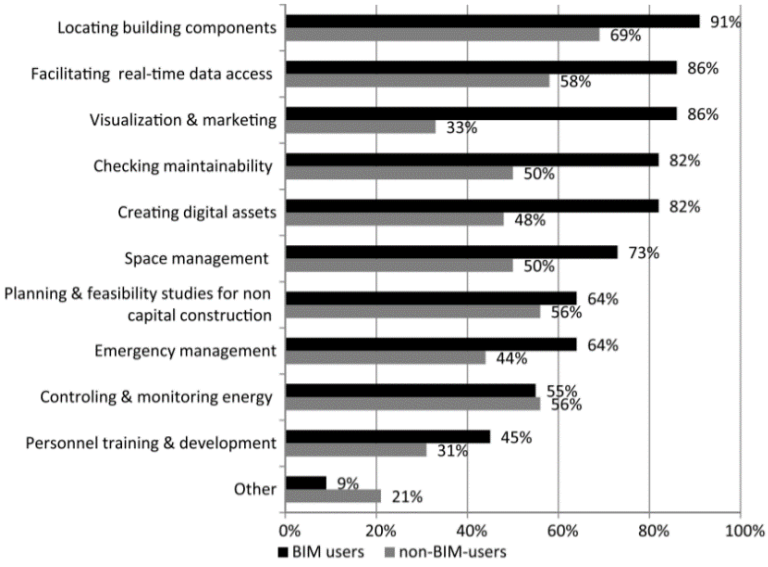

Fig. 2 - Potential FM application areas that BIM can be used for

So, based on the Burcin Becerik-Gerber / Farrokh Jazizadeh / Nan li / Gulben Calis research, what kind of information is important to do all that was listed? Let's take a look (it is minimum information, some of them based on the research and some in my experience, but much more can be added):

Location building components

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Proper nomenclature and organization
- Specification
- Maintenance history
- Unique identification and cost center for the assets
- Location (site, building, zone, floor, room)

Facilitating real-time data access

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Proper nomenclature and organization
- Specification
- Maintenance history
- Unique identification and cost center for the assets
- Location (site, building, zone, floor, room)
- Occupancy information and schedule
- Areas served by the equipment
- Variable air volume (VAR)

Checking maintainability

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Proper nomenclature and organization
- Specification
- Maintenance history
- Unique identification for the assets

Creating digital assets

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Proper nomenclature and organization
- Area served by equipment's
- Unique identification and cost center or the assets
- Association with correct data and documents (manufacturers manuals, etc)
- Barcode / Asset tag
- Specification: manufacturer/vendor information such as serial, model and part number)
- Description: type, asset number, equipment group, criticality, status)
- Attributes: weight, power, energy consumption
- Maintenance history
- Warranties and Install dates

- Operation and maintenance instruction manuals
- Certificates
- Unique identification
- Location (site, building, zone, floor, room)
- Invoice information (number, scan)

Space management

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Proper nomenclature and organization
- Color standard for identification of department and spaces
- Space number / space catalog
- Description
- Boundaries
- Areas (gross, assignable and nonassignable)
- Area served by equipment's
- Number of people for the room initially designed
- Number of people using the room
- Furniture's: which department / people is using that furniture, space occupied by the furniture
- Volume
- Intended use
- Design use
- Structural floor charge
- Cost Center
- Location (site, building, zone, floor, room)
- Maintenance history

Planning & feasibility studies for non-capital construction

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Maintenance history of the materials, labor and cost designing and constructing
- Components phases

Emergency management

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Emergency route information (plan, walkthrough videos)
- Area served by equipment's
- Color standard for identification of department and spaces
- Space number / space catalog

Controlling & monitoring energy

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Area served by equipment's
- Maintenance history
- Asset information

Personal training & development (include every single information above)

- BIM Model as-built for all disciplines
- Conceptual information of the building
- Proper nomenclature and organization
- Specification
- Maintenance history
- Location (site, building, zone, floor, room)
- Occupancy information and schedule
- Areas served by the equipment
- Variable air volume (VAR)
- Association with correct data and documents (manufacturers manuals, etc)
- Barcode / Asset tag
- Specification: manufacturer/vendor information such as serial, model and part number)
- Description: type, asset number, equipment group, criticality, status)
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- Emergency route information (plan, walkthrough videos)
- Components phases
- Invoice information (number, scan)

Basically what the FM team wants is information. Do you know why? Because 12,4% of their time is wasted trying to find information that is lost due to the lack of interoperability, it is like a whole month of work thrown away each year because the information is somewhere in limbo.

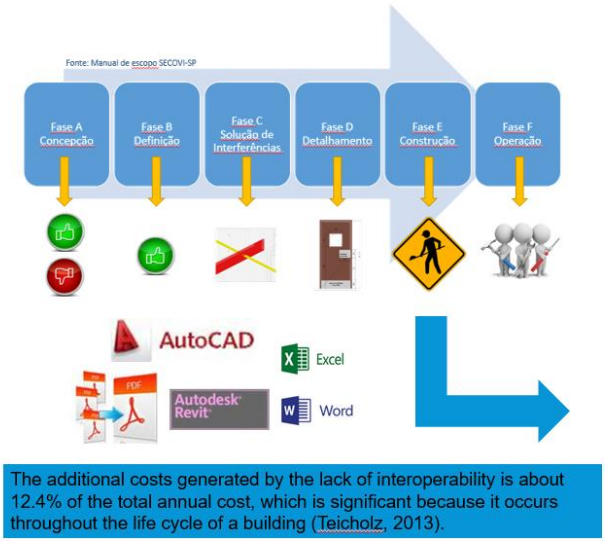


Fig. 3 - Example of a typical technical information storage for a building operation

Having these numbers and information, you probably are now asking yourself “how can I help the FM team to transform a useless model in a priceless model for them?”

To answer that question, we need to understand first how the Facilities Management world work.

What is Facilities Management?

Being didactic we can define Facility management (or facilities management or FM) as a management discipline concerned with the integration of processes within an organization to maintain and develop agreed services which support and improve the effectiveness of its primary activities.

FM is a huge world and we can easily write a book about this, but to help us in the development of the thinking here and linking this with BIM, as always, we need to know what we want first to then think what we going to do in the model.

Basically there are at least eight common fields in the FM world (this list can be bigger… but let’s get a point to start), they are listed below:

- Real Estate Portfolio Management
- Space Planning Management activities
- Move Management
- Building Operation
- Asset Management
- Sustainability and Risk Management
- Workplace Services

- Technology Extensions

In the Autodesk Building Ops world today we can only do Building Operation (Schedule and Reactive maintenance) and Asset Management.

In the Autodesk Revit world, we can use the information of the rooms and prepare some of the families to feed Real Estate and Space Planning management. Let's see how this works.

How to prepare a BIM model for FM

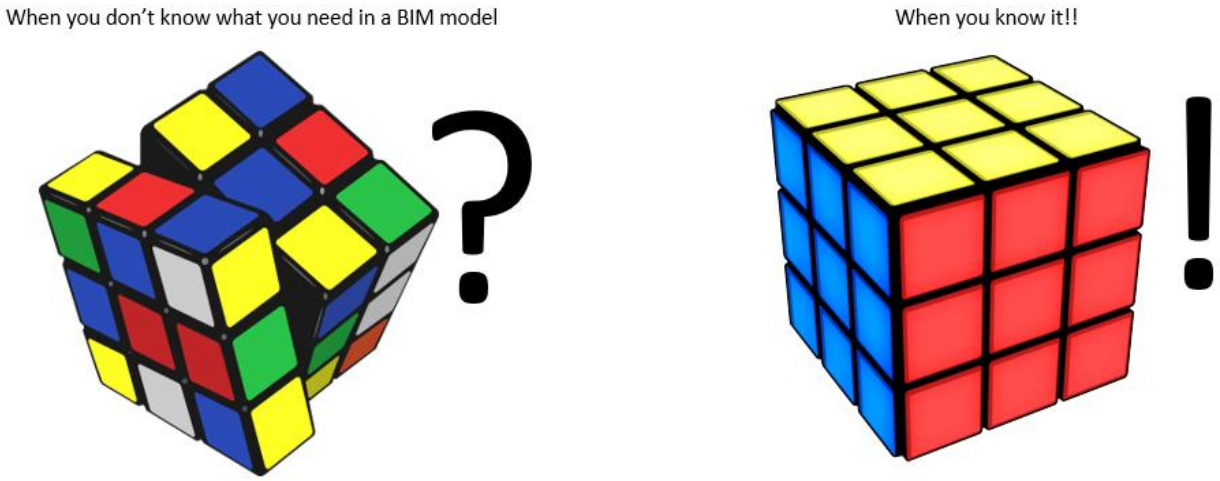


Fig. 4 – Magic BIM cube

The figure 4 is a good analogy to make when it comes to know or not to know the kind of information that you need to input in the BIM model to get it done for FM.

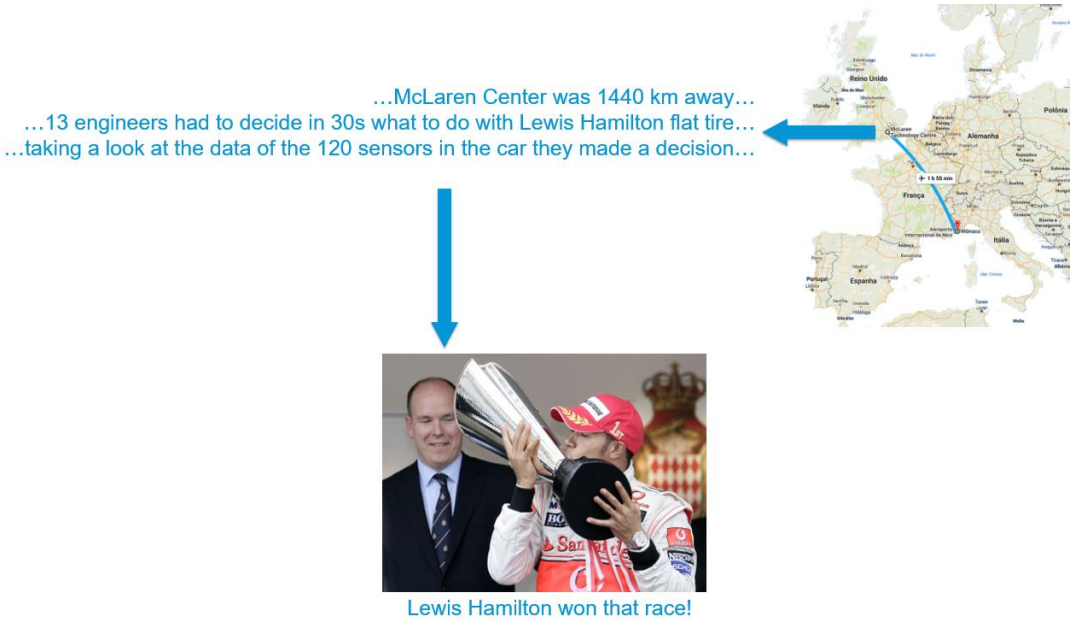
Let's consider that when the FM team enter in the building they are a five-year-old child that need to be raising and formed in that building to become a great adult, in other words, they need to learn where the things are, how to operate the systems, which panel turn on / off the systems, etc..

For me, one of the most important things for the FM team it is to know why the building were built that way and for what purpose / dimension the spaces were made by the architect.

If the building were initially designed to be a school, how important is to know the charge that the structural floor can support in the 2º floor to turn an empty lab into a small library? Or how important is to know for how many people were design the refectory when for some restoration the school becomes a cultural center?

Another thing that we have to take care of is that in the end a BIM model can have gigas of data and even if you provide a big amount of information you will need to know what to use that information.

As a big Formula 1 fan, I have to say that the F1 teams knows how to use the information like no one else. A good example of that it is the 2008 Monaco Grand Prix where the great Lewis Hamilton hit a barrier and got a flat tire.



That is an excellent example of how to use information to win.

So, let's beat this challenge of BIM for FM. How can we start? To prepare the BIM model to share initial design information with the people that are going to operate the building is a really good thing to do, but how can we do that? Take a look in the next chapters.

Important: for all the steps described below you will need the BIM Model as-built and the conceptual information of the building.

Information in rooms and area / plan views

Create a space plan view in the BIM model with these information, in the room tag include information like (based on a school classroom):

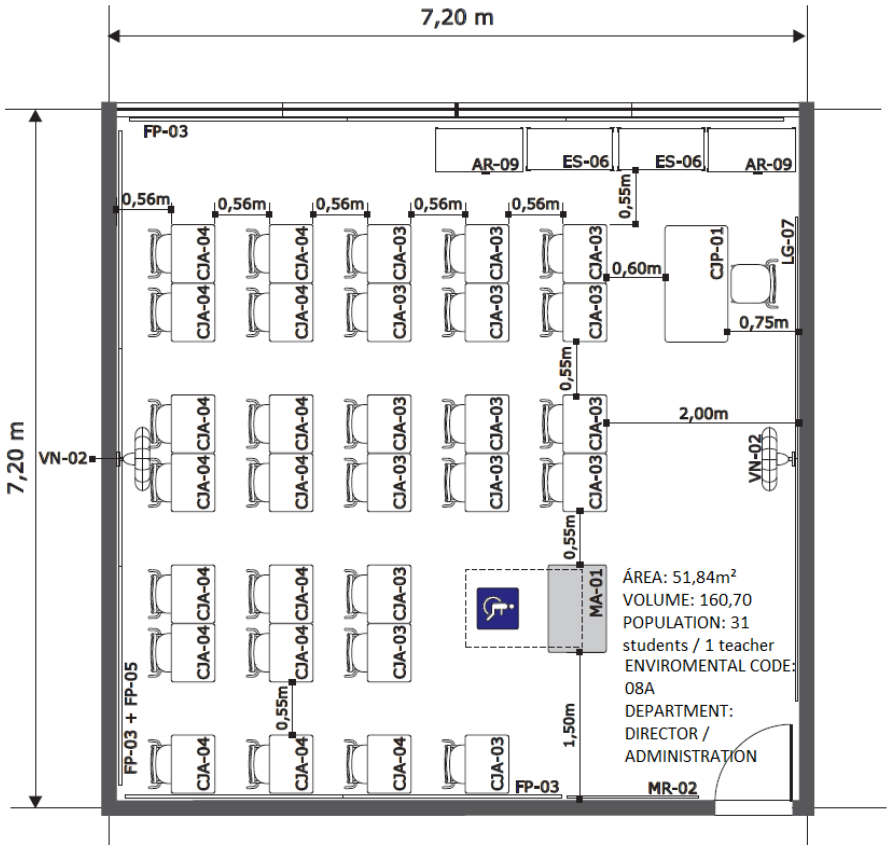


Fig. 5 – Room in FM plan view

- Area: based on IMFA 1836 / ASTM E-1836
- Site Code: unique site code
- Building Code: unique building code
- Floor Code: a code for the floor (in this case you can use the same for all buildings)
- Cost Center: a code for the cost center usually described in ERP systems, by this you can register the cost of any modification in the right place
- Zone Code: HVAC zone code
- Room Code: a unique code for the type of room, example: every class room will be 08A
- Volume: Volume of the room for VAR
- Population: for how many people the room was initially designed for
- Design use: original use of that room
- Status: in use, not in use (you can create your own)
- Department: which department the room is part of

- Structural floor charge: this can be found in the structural project, but it is important to have this information in a quick way when it comes to reform, renovation or change of use of the building
- Simple Name of the room: just the name of the room in a simple way (Classroom)
- Complete Name of the room: we have to consider a new kind of nomenclature because for portfolio and space management it is important to know where that room is. To know where that room is we need to know in which campus the building is located, which building, which floor and which cost center (ERP cost center) the room take part. Now take a look in the new name of the room:

CAMPUSCODE_BUILDINGCODE_FLOORCODE_COSTCENTERCODE_ROOMCODE_ROOMNAME

OR

BRSP430_430.01_02F_034567_08A_CLASSROOM

You can decide how much information you will include in the plan view, but all the information listed here will be new room parameters. You can also use schedule keys to facilitate your work in the classification of the campus, buildings, floors, cost center and room codes.

For the identification of the assets, take a look in the equipment's information in the next chapters.

An important thing is to also create a room schedule having the information about the material specification of that room, by this the FM team can easily have access to what were constructed and go for maintenance in the right direction.

The ROOM CODE is very important, because you also have to take care to do not transform the BIM model into a specification catalog of the Building. You can add information by linking the model with documentation outside the model. This is what the ROOM CODE is, a code to a room catalog specification that has all the specification of the room with information like:

- Environmental characterization
- Guidelines for project
- Environmental requirements
- Equipment

Here are some examples of these room specification catalog:

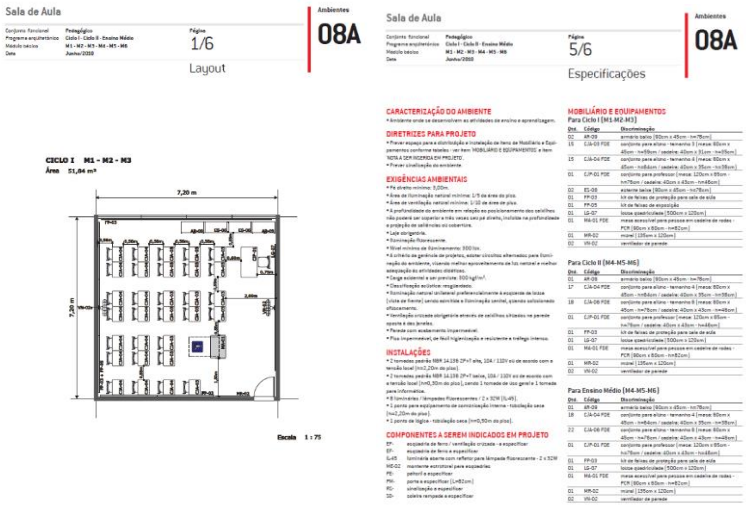


Fig. 6 – Room specification catalog

It is also important to notice that depending on the kind of strategy that you adopt with the wall you will have to consider a re-work in the model to get the right area value in the rooms. (if you decide to use rooms to control area based in the IMFA 1836 / ASTM E-1836).

If using room is your option, please consider reviewing these options in Autodesk Revit:

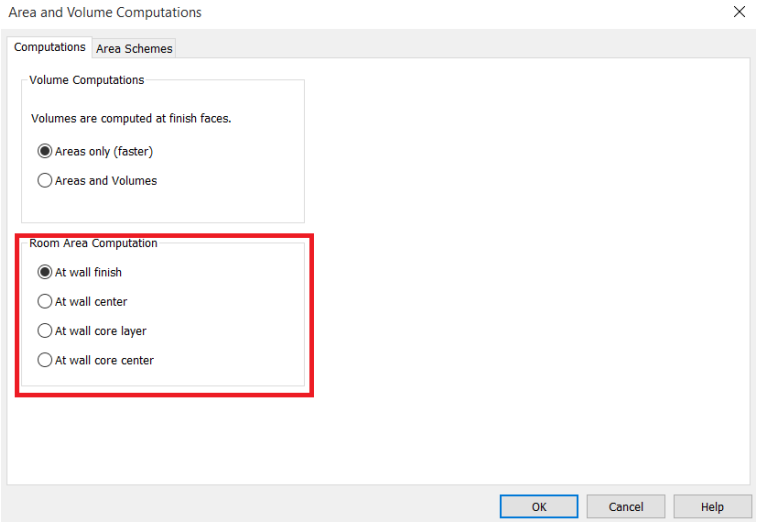


Fig. 7 – Area and volume computation

If you model a unique wall with all the cores you will not have so many problems to adjust that, but if you model each wall as a core you will have to turn off the room bounding to adjust the area for IMFA 1836 / ASTM E-1836 needs. This can take time in big projects.

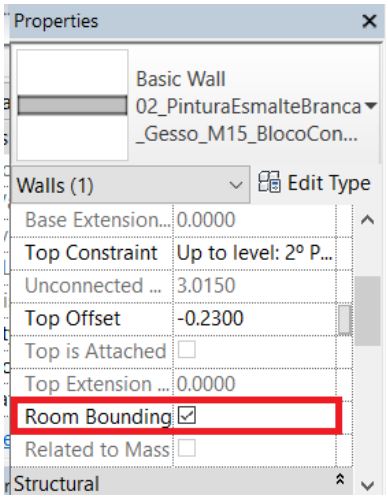


Fig. 8 – Room bounding

To avoid this kind of problems with rooms you can consider create area plans to take off the areas of the rooms, but this will also take time, but in my opinion it is a better strategy to use if you are using the separated core walls.

In any case you will need to label, annotate and color the room / areas according to FM guideline. It is also interesting to create emergency route plans to help in the emergency management.

Project Information

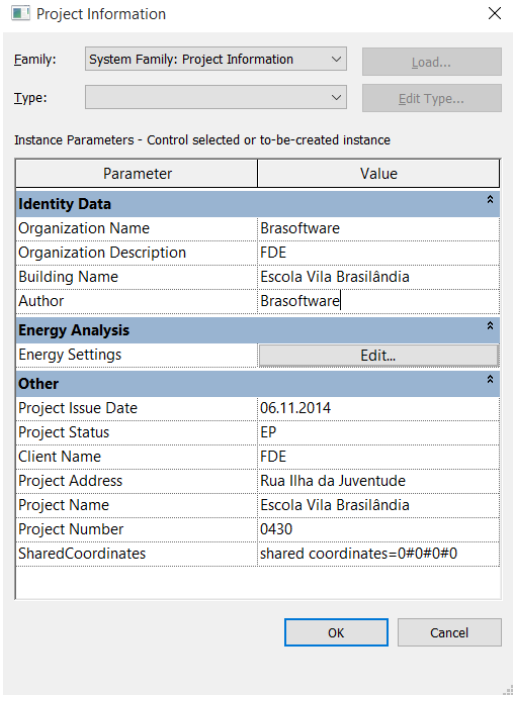


Fig. 9 – Project Information

The project information has to be filled, period. It is by this Project Information in the manage tab of Autodesk Revit that we can track the last date of update of the model, see information about who modeled, which is the status of the model and input information that will be shared with CAFM to make the Portfolio Management.

It is more a modeling and mandate thing, but it is really important that the model also have the information above:

- BIM model instruction manual:
  - this manual as the information like the division of the model, coordination file, plan, area, rooms, schedules, sheet views list found in each model, proper nomenclature and organization of the families, etc…
- Levels
- Grids
- Shared Coordinates
- Right location of the building
- True north

All this information has to be defined in the BIM execution plan that is developed in the beginning of the project. The BIM execution plan will later evolve in the BIM model instruction manual.

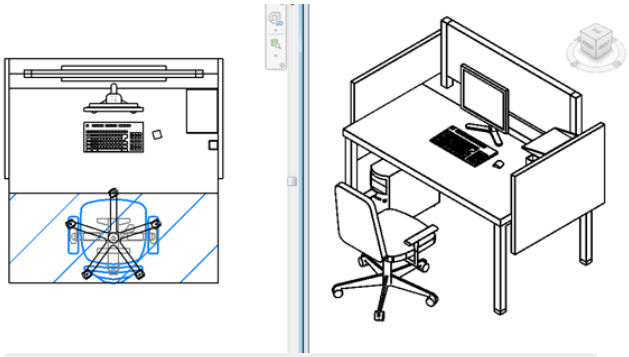
Information in furniture's

When it comes to space management including information in the furniture's it is essential to get the correct area apportionment.

A good way to do that is to prepare furniture families to inform their areas in some of the parameter in the family then, when the family it is in use in the project, you use project parameters / schedule keys to control the use of the furniture in the rooms to get the right area apportionment.

In the schedule keys you will have to include the information of all department's that are using the building (or you can extract an excel list from the CAFM / HR and the import in Autodesk Revit), then you simple select the furniture and say which department that furniture belongs.

Use visibility filters to control the colors of the departments in the plan views, take a look on how this intelligence works:



Type Parameters

Parameter	Value
OmniClass Title	
Code Name	
Model Properties	
Codigo Porto Seguro	010065428
Codigo Alberflex	M1LI9251416
Area Ocupada	1,960
Data	
Site	www.brasoftware.com.br/au
Empresa	Brasoftware / quattroD
Criação	Tiago Ricotta
Visibility	
Visibilidade (Lateral Esquerda)	☑
Visibilidade (Lateral Direita)	☑
Visibilidade (Area)	☐
Other	
Contagem Posição	☐

Fig. 10 – Family information (parameter “area ocupada” has the information of the area occupied by the furniture)

Fig. 11 – Plan view with furniture using visibility filters from schedule key department values

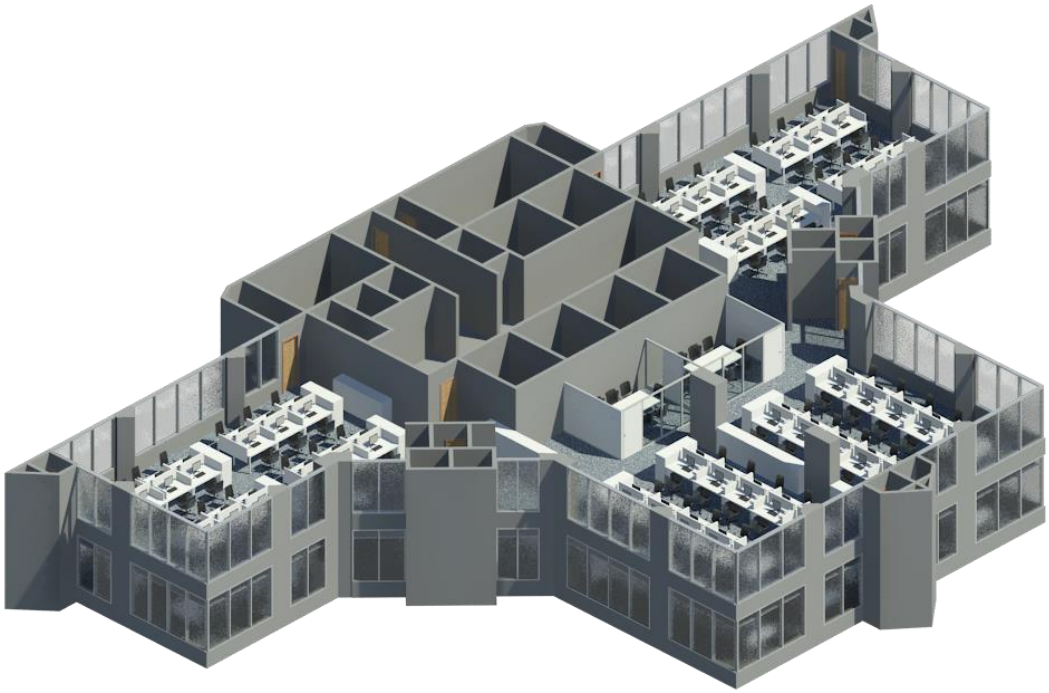


Fig. 12 – Space management using Autodesk Revit

Information in equipment's and components

A single equipment can have so many information that we really have to take care about which one's we will leave in the model and which ones we will leave the manufacturer catalog.

So, which parameters we are going to use in a single equipment to help track information for the FM team?

- Cost Center: a code for the cost center usually described in ERP systems, by this you can register the cost of any maintenance in the right place
- Specification
  - Barcode / asset tag
  - Manufacturer
  - Serial
  - Model
  - Part number
  - Vendor
  - Invoice number
  - Material applied
- Description
  - Equipment group

    - Status
    - Criticality
- Attributes
    - Weight
    - Power
    - Consumption
- URLs: try to have a database in your network / document manager where you can control and store all the manufacturer and vendor manuals (operation and maintenance instruction and more), by this you can create URL parameters in the BIM model that can open these documents when the FM team need. Do not use the manufacturer URLs because they change all the time.
- Install date: for this information you will need to coordinate a process with the people in the construction site to collect that information. BIM 360 Field is perfect for this, take a look in the information collected in the field process below
- Warranty length: for how much time the manufacturer will give warranty for the product
- Name of the asset: simple name of the asset using the BIM execution plan nomenclature
- Complete Name of the asset: we have to consider a new kind of nomenclature because for the asset management it is important to know where that asset is located. And more important, this asset have to have a unique identification that have to make sense for the FM team. To know where that asset is we need to know in which site the building is located, which building, which zone, which floor and which cost center (ERP cost center) that asset make part. Now take a look in the new nomenclature created:

SITECODE_BUILDINGCODE_ZONECODE_FLOORCODE_COSTCENTERCODE_ASSETCODE_ASSETNAME

OR

BRSP430_430.01_ZN01_02F_034674__E303_ELETRICPANEL

- Areas served by the equipment: this is complicated because you will need to use the MEP system browser to know which panel turn in / of the electric equipment's of the building (this also includes HVAC and Hydraulic systems). If the MEP project wasn't built in Autodesk Revit or the model wasn't contracted for this use you will have to have some effort to create that logic in Autodesk Revit or try to make a BIM Mandate specifying to the MEP modelers that they will have to input that information in the model for you

All this information can be easily created in the families and project by parameters, but will need some time to input and some effort to maintain update.

Information collected in the field

The design process can include many information about specification, conception and other many other things in the model for the FM team, but the construction team have a crucial role for the process.

We know that in the construction site many changes can occur that will have to reflect in the model (3D) and in the information (specification, etc). Also, in the field we can have many quality issues that is not a problem of the project, it is a problem of bad execution of the project, this will reflect in the failure in the quality checklists of the field quality assurance.

Imagine how valuable the information of these changes and quality checklist failures in the field could be for the FM Teams in the future operation of the building.

By this, collecting data in the field becomes very important in an integrated process of design-bid-build-operate.

Any problem that appears in the future when the building will be in the hands of the FM team related with that quality checklist that had a failure will be gold for facilities. How can we integrate the teams?

Autodesk BIM 360 Field can help in the process of collecting these data, the software has eight distinct functions, but they can and must make the bridge between design, construction and FM teams. This eight tools are:

- Issues
- Tasks
- Checklists
- Daily diary
- Equipment's
- Library
- Photos
- Reports

When a checklist is completed in BIM 360 Field and there is an entry that failed in a quality check, the most important thing in the quality management system is to be able to carry out the traceability of information.

Be able to identify which checklist held the failure check and what is the nonconformity number generated from this checklist is also important.

Thus, the entire construction of checklists forms must be linked by categories of non-conformities. The same thing should be done between tasks and equipment's.

The key traceability and compliance with the ISO 9001 requirements is how to categorize each scanned element in the construction site and link this information between each of the BIM 360 tools.

To do this, the first thing that should be done in the process is the analysis of the company's quality management processes for further computerization of the quality checklists.

BIM models can help a lot in this matter, since the creating if tasks in BIM 360 Field can be made considering the elements in the BIM model and the link of them with e WBS of the construction (this is quite difficult to be made manually, but we have done this link by programming), so by the correct association between a construction element in the BIM model and the categories of the task, checklists and equipment's issues, we can track everything that happens in the field.

This can bring relevant information from the field to the FM teams in the day-to-day work.

The information comes in the development of the project and is used by the construction company that benefits from a better project. But what kind of information the field can provide for the FM team that is valuable? We will answer this by presenting a simple screen of Autodesk BIM 360 Field equipment's tab:

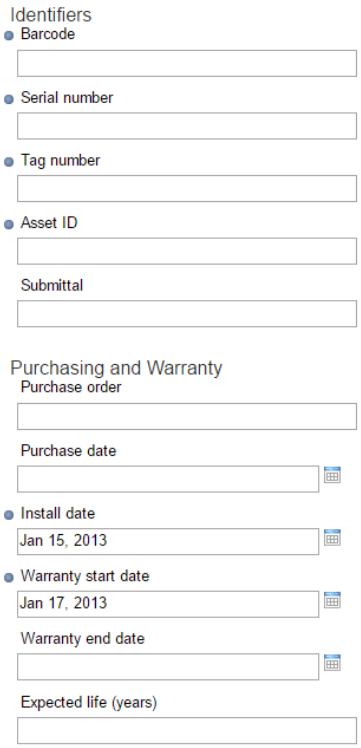


Fig. 13 – Equipment in Autodesk BIM 360 Field

All information presented in Figure 13 can be exported later for both Autodesk Building Ops / Autodesk Revit, so the FM team can actually use this valuable information to operate the building.

The challenge is to turn the key in the day to day work to deploy a process where the engineers works succeed through a mobile recording, all these extremely valuable information, for those who will operate the building.

Thinking in the benefits of this process, one of the major problems that Owners have is to be able to apply the warranty of the assets.

Since this is a big problem, if you can find the information of the install date collect during the construction time and then apply the warranties, this can have a large gain with a process where the field will feed the operation information and make the owner saves money.

This is the biggest compelling to implement such a system.

All the information of the invoice still would be registered within the ERP systems of the companies, but Autodesk BIM 360 Field can scan the invoice and store that information for future use.

The diagram illustrated by the figure 14 shows how the information will work in BIM 360 Field:

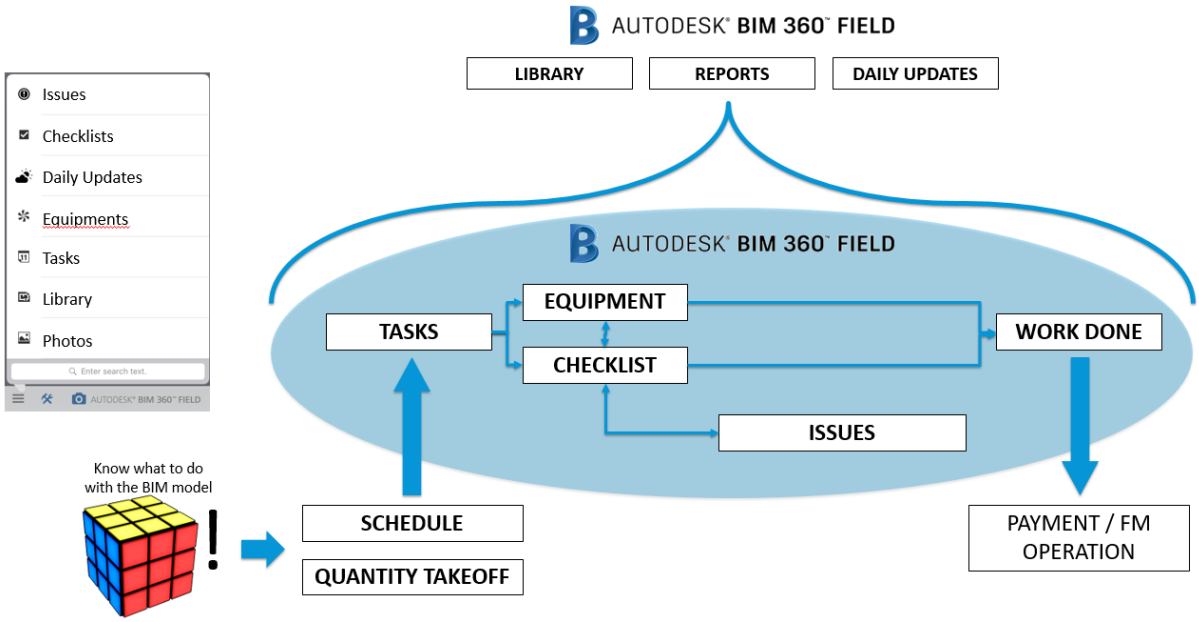


Fig. 14 – Equipment in Autodesk BIM 360 Field

The integrated process with Autodesk Revit, BIM 360 Field and Building Ops

The process of working with Autodesk technologies for integration between design, field and FM goes through the following diagram:

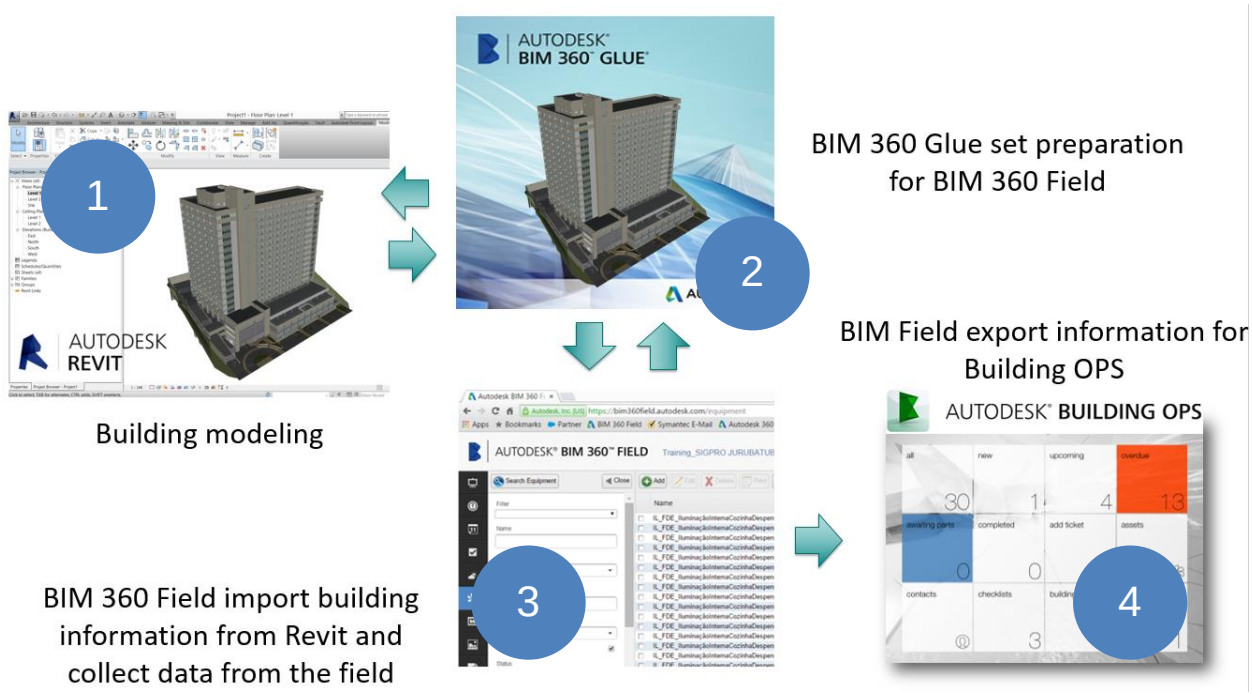


Fig. 15 – Work process between Autodesk solutions

01. All components of the building are modeled, there is no need for a very high LOD if the model is being developed only for operation, but this has to be discussed in the BIM execution plan if the model will be developing to cover all early stages of design and construction.

02. Autodesk BIM 360 Glue is responsible for creating categories and instances for all the building components, then this will be exported and automatically created in Autodesk BIM 360 Field after configure and mapping the parameters from Autodesk BIM 360 Field and Autodesk Revit.

03. Autodesk BIM 360 Field conducts the registration and collection of information in the field.

04. Autodesk Building Ops performs the import of all the information from Autodesk BIM 360 Field equipment for its assets and resources.

How to connect Revit and Building Ops?

To connect Autodesk Revit and Building Ops just follow the step by step below (my building ops is in Portuguese, but the buttons are in exactly same place):

1) Go to the building ops page and click the configuration button:

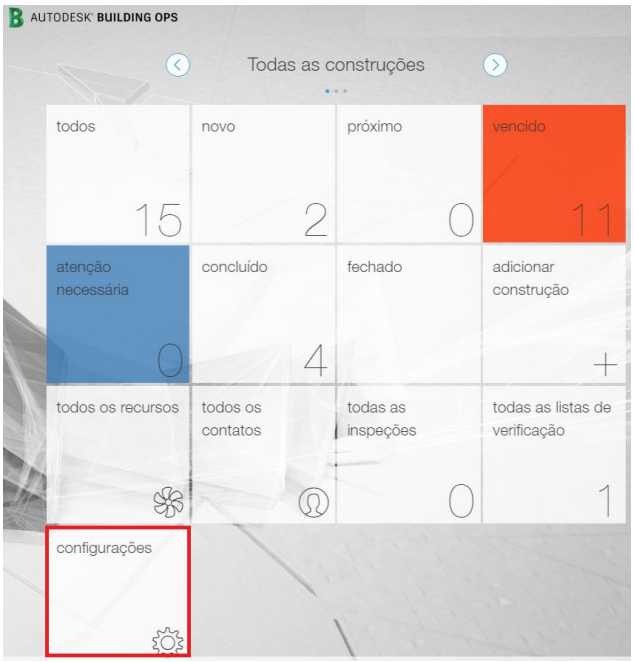


Fig. 16 – click configuration button

2) In complements / extensions download the Building Ops app for Autodesk Revit

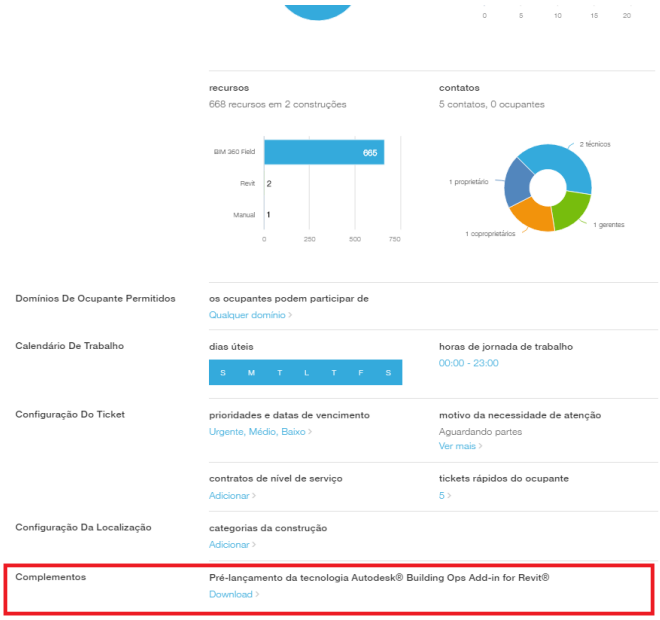


Fig. 17 – download Revit extension

3) After installing the Building Ops plugin for Autodesk Revit connect the projects selecting the exportation code that you will find in the details of your Building Ops account. After that just select any component in the project, go to the add-in tab and select the export button in the Building Ops options.

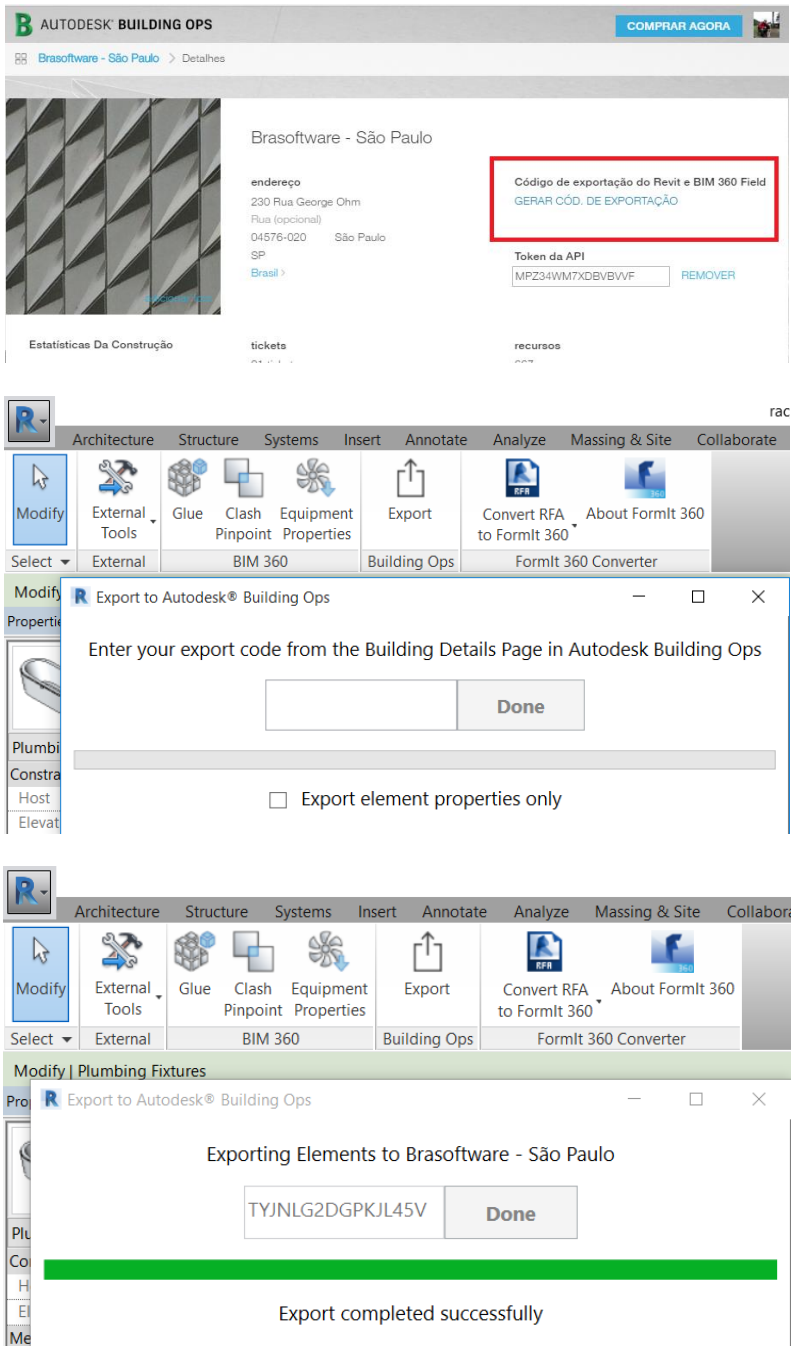


Fig. 18 – connect Building Ops with Autodesk Revit

4) After exporting the component to Building Ops, just search for the name of the family that you will find the asset.

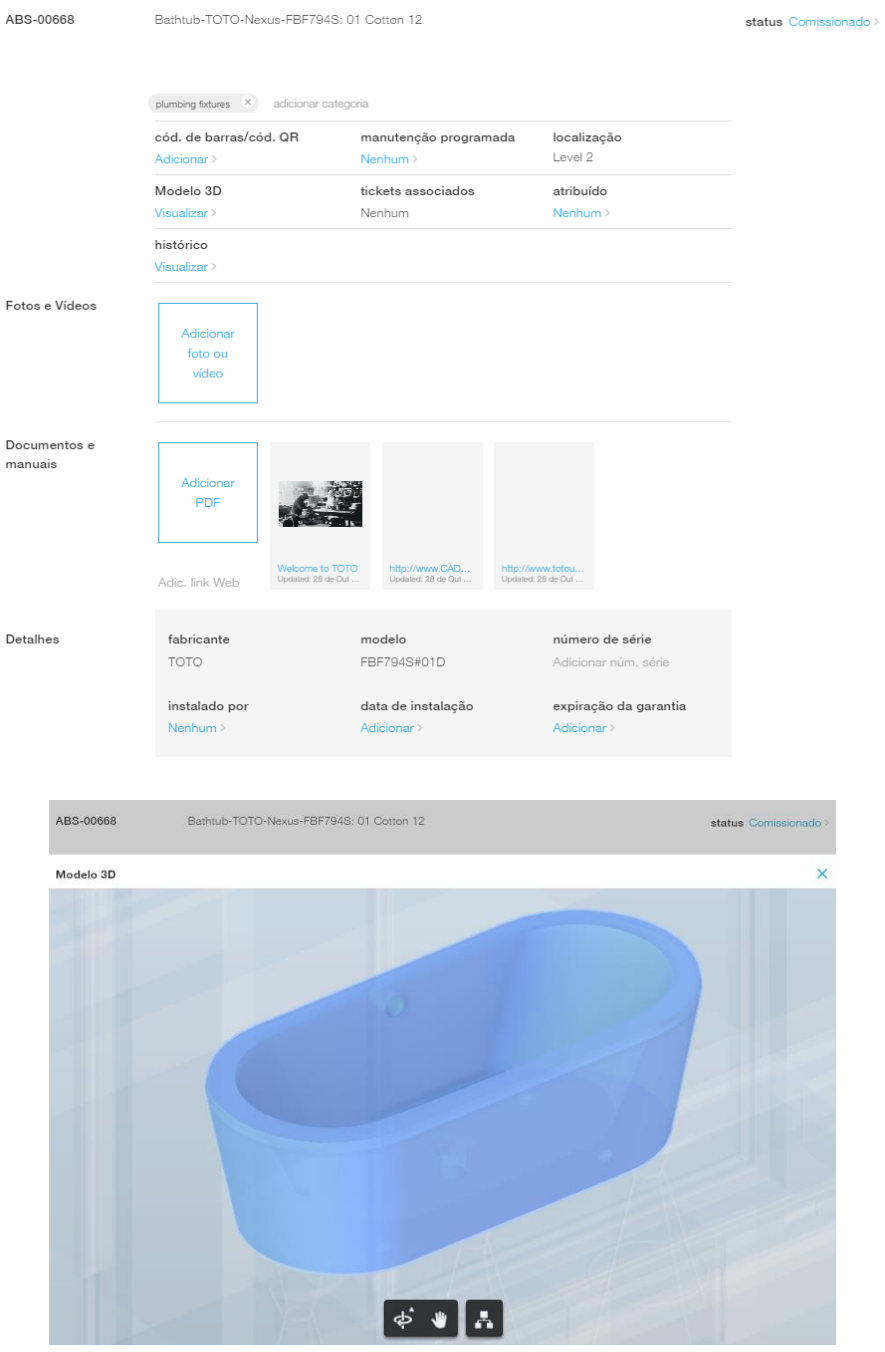


Fig. 19 – Asset from Autodesk Revit in Building Ops

How to use Building Ops to operate your building?

Like I said in the beginning of this paper Autodesk Building Ops for now (2016) it is a software based for asset and operation management, if you need to do some other stuff like portfolio, capital, sustainability, risks management you will need other CAFM software's.

So, how Building Ops works?

Portfolio view

Basically it has a Portfolio view that will show you all the buildings that you have (but do not have all information required to effectively do a Portfolio Management).

Fig. 20 – Portfolio view

In this first portfolio view you will have the view of all tickets open in all buildings that you are using Building Ops. It will show to you all tickets and then it has some filters like new, next, old, attention required, conclude and closed.

You also can add a new building, see all the assets, inspections, contacts and verification lists. The resources here are really simple and easy to use, there not much more to say about this views, unless that in the configuration tab you have some statistic of how many building, assets, tickets and contacts you have in your entire portfolio.

Building view

When it comes to the Building View you will have all the same resources of the portfolio view, but here will be just for one building.

The trick here is to connect tickets, to assets, to contacts, to verification lists, to models, to plan views, to manufacturer documentation.

First of all, if you have a BIM Model you can create aaaaall your assets automatically by using the export plugin from Autodesk Revit to Building Ops. The trick is to do not select anything in Autodesk Revit Model and then push the button to export all the equipment's modeled in Autodesk Revit to Building Ops.

If you do this, it should appear a screen just like this:

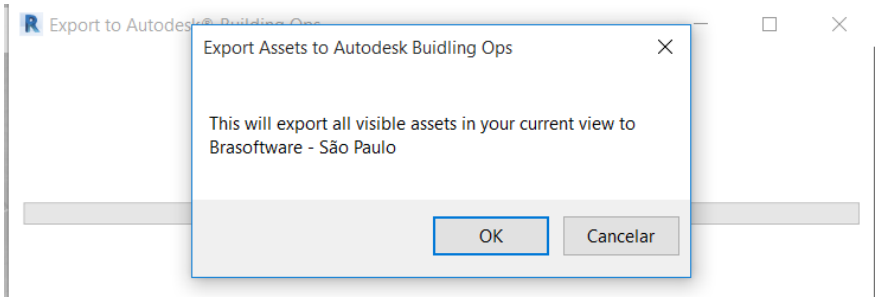


Fig. 21 – Holy mother of God, it will create every single asset automatically

In this workflow you won't get any information from the field (unless you prepared the model just like we described earlier).

If you have BIM 360 Field in your workflow and made the step by step described earlier the only thing you will have to do is to export the information from BIM 360 Field in the equipment's tab to Building Ops pushing one button.

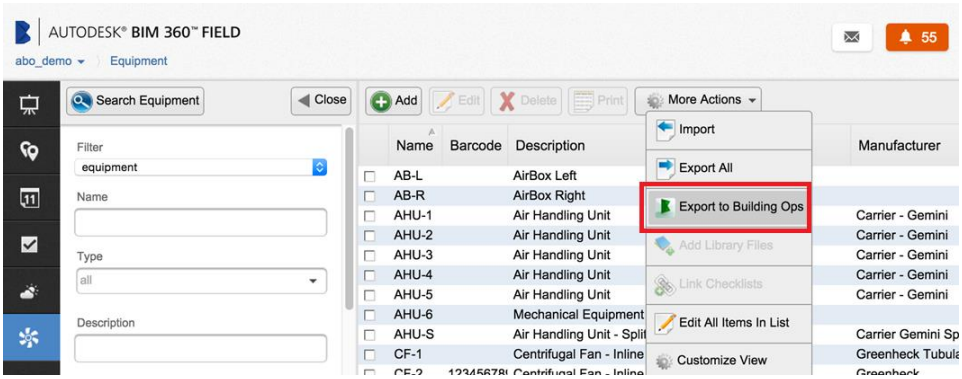


Fig. 22 – Holy mother of God, it will create every single asset automatically

If you do not have a BIM Model or either BIM 360 Field you will have to create an excel file with all the information of the assets and then import via CSV file or will have to make the registration of each asset one by one.

After registering all the assets, the next step will be to fulfil the information of these assets with the manuals of the manufacturer and information about the asset, this will be quite a big effort because you will have to:

1) Have all the catalog of the manufacturer stored
2) Identify which catalog will have to be registered in each asset
3) Fulfil the information's such as manufacturer, model, serial number, who installed, install date, warranty expiration

   After registering all this information, you will have to create a programmed maintenance plan for all the assets.

   This programmed maintenance plan will take another big effort because you will have to say when and who will make the maintenance in the future.

This will create automatic tickets that will be sent to your technicians when will be the time to do the maintenance in that equipment.

For maintenance plan that is part of the things that can done with Building Ops.

For day-to-day operation the user of the building can open tickets easily from the cellphone, but here Autodesk has a video that better explain this operation.

The important thing here is to measure what you can do or not to do with Building Ops, basically it you want or need to:

- Have one common base for registering your assets and schedule maintenance

- Open maintenance tickets from your phone and schedule a repair
- Have one common base for register the information about the building, assets, plans and BIM model

For this, Building Ops can help you. Other things you will have to consider some customization.

Is it worth the efforts to evolve BIM for FM?

Having come this far in this paper you probably are asking yourself that this is a lot of work and this usually is not demanded by owners, but in my opinion, being entrepreneur and creative, I really believe that all this effort to customize a BIM model for FM can be a new service project and construction firms could offer for the owners.

Someone will have to pay this bill, but we have a strong compelling here that is the number of 80% of the costs of the building in 25 years will be spent on the operation of the building, not in project-construction phase.

Is it worth? Of course!!

Is it a lot of work? Of course!!

Will we have to review our project-construction-operation process to adapt to BIM? Of course!!

There is a big barrier here, with people, technology, hardware and process, but as big as the barrier it is the opportunity to offer new services and gain / save a lot of money in this business.

As soon as the owners sees and get mature with this technology he will start to see this as an investment, not as a cost.

The problem once was what do I have to consider to use BIM for FM, now that you know what is important. What FM teams wants.. And what you have to do in your model to evolve your model to FM.. what are you waiting to offer this service to your client?

Of course, operating this amount of information is another thing, the owner has to consider also the evolve of the FM teams to go on with this idea, but this were also a barrier in the beginning of BIM and look now what we have accomplish in the past few years with BIM dissemination.

For sure as soon we start to talk, lecture, discuss BIM for FM, the industry will see the value the information and process.