



Co-located with:



Introducing:



**18 - 21 FEBRUARY 2023**  
RIYADH FRONT EXHIBITION AND  
CONFERENCE CENTER (RFECC)

# BIM Applications & New Trends

Kamal Shawky  
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CONFERENCE CENTER (RFECC)**

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**Kamal Shawky**

Executive Director | First Option

- one of the main committee for Egyptian BIM Standard
- shortlisted for the Technology leader of the year BIG 5 , Dubai , 2022
- Awarded as the Second place in Africa as Best Engineer in BIM 2021.
- the Author of BIM Fundamental 2011 Book
- the Author of Revit Structure Fundamental 2012 Book

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**ACUD**  
ADMINISTRATIVE CAPITAL  
FOR URBAN DEVELOPMENT  
العاصمة الادارية للتنمية العمرانية

هيئة المجتمعات العمرانية الجديدة  
New Urban Communities  
Authority



# AUTODESK



## Authorization and Accreditation



### Other Partners



### Conferences and forums



## BIM Specialist of the Year 2020

BIM Specialist is one of a key provider of BIM knowledge, understanding and guidance; they will be coordinating the project models and data, therefore in this category we wanted to see how you do this, the process you take and what this means to a project. Tell us how you deliver your consultancy to solve problems, how you manage information within a project and what support and/or training you offer your clients. Please use examples and reference to case studies for on-going and completed projects.

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bimawards

Sponsored by  
NEMETSCHKE  
GROUP

**BIM Awards 2020**

The BIM Awards honour and recognise the world's best BIM work and those who created it, by celebrating their exceptional and innovative use of BIM in the built environment.

## Achievements

One of our big achievements in 2020 was that Autodesk has chosen

TEA Serv (First Option Now) as the only company in Egypt for BIM Services provider, Value Added Reseller and Autodesk Technology Partner.

This commitment has allowed us to deliver the best quality service at every stage of each project.

Thanks to our team, we have been able to achieve such a feat. We take great pride in our team and understand that we can only grow from strength to strength by constantly hiring the best calibers and cultivating their talents and expertise through state-of-the-art technologies, the best quality assurance systems, and a pool of outstanding professional assurance systems, and a pool of outstanding professionals

<https://servicesmarketplace.autodesk.com/provider/public/tea-engineering-services#Services>

### BIM Specialist of the Year sponsored by dRofus

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ASCCBIM  
TEA Engineering Services

## BIM Awards



Appreciation award from Autodesk for BIM adoption in Egypt and Middle East



Award for Out-Standing start up across Africa



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## Sample From Our Clients



ORASCOM  
DEVELOPMENT



PALM HILLS  
DEVELOPMENTS DOME

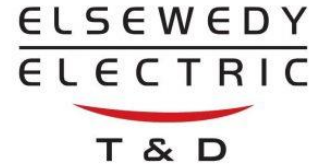




ATRIUM  
Quality Contractors

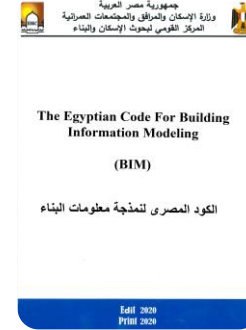
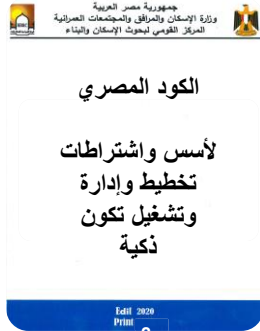


The Arab Contractors  
Osman Ahmed Osman & Co.  
المقاولون العرب  
عثمان أحمد عثمان وشركاه



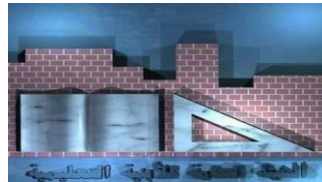


# BIM in Egypt



**ACUD**  
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FOR URBAN DEVELOPMENT  
العاصمة الادارية للتنمية العمرانية

وزارة الإسكان والمرافق والمجمعات العمرانية  
Ministry of Housing, Utilities & Urban Communities



هيئة المجتمعات العمرانية الجديدة  
New Urban Communities  
Authority

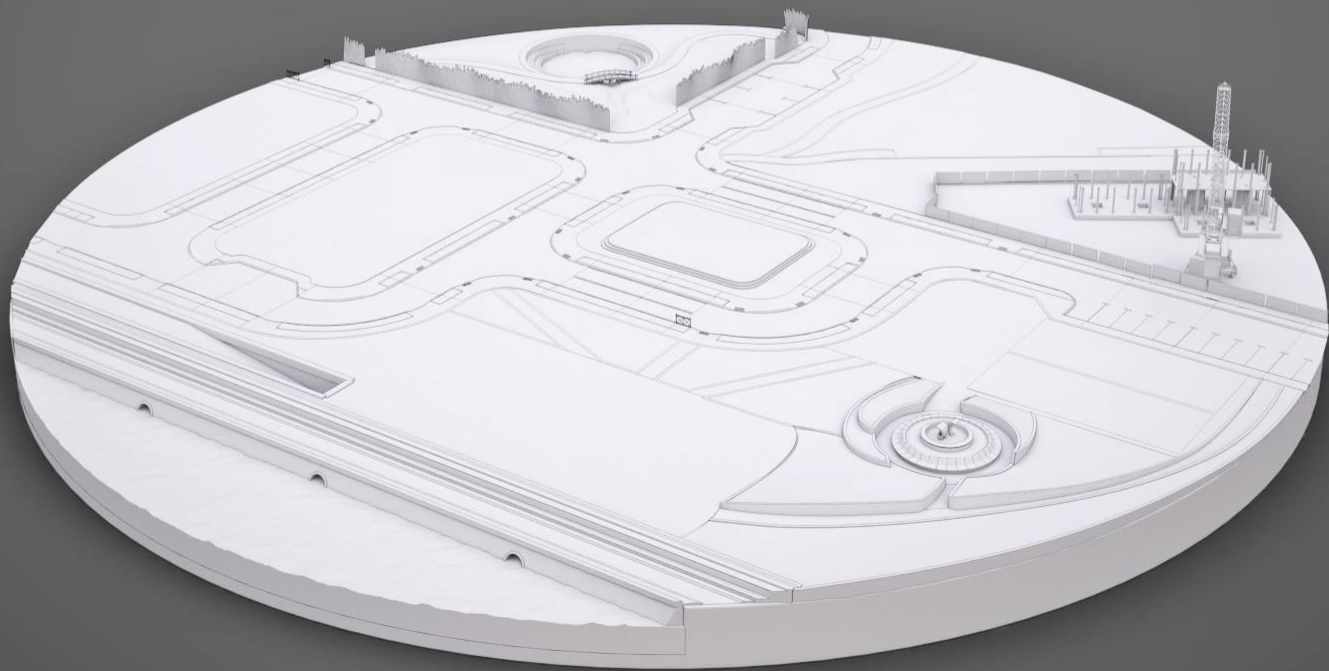


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# BIM for Buildings

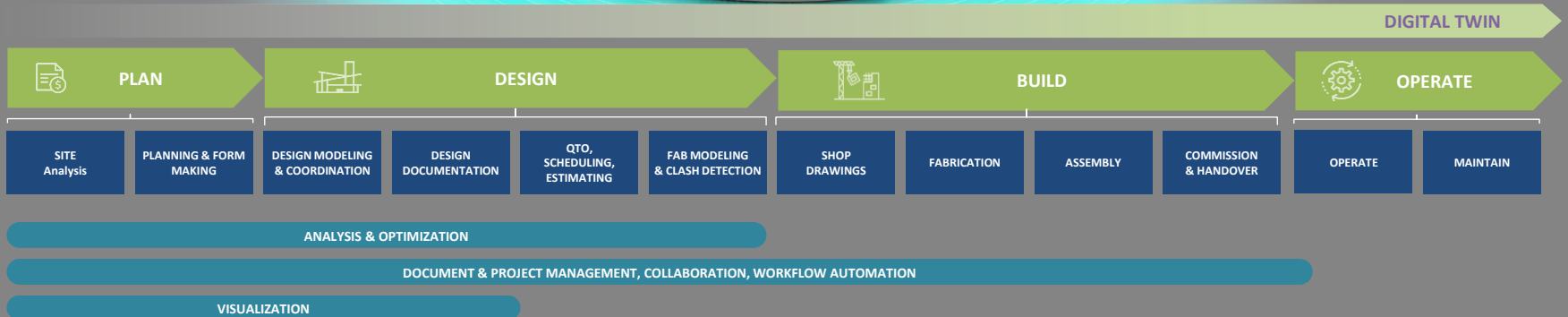
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Workflow slides



# BIM IS THE FOUNDATION OF DIGITAL TRANSFORMATION

Empowering seamless collaboration, decision making and better outcomes for all stakeholders, and built on a connected data experience allowing continuous iteration and improvement





# Beyond BIM and The new era of digital transformation journey

- 1 Digital Twin
- 2 AI
- 3 Augmented Reality
- 4 Add-ons

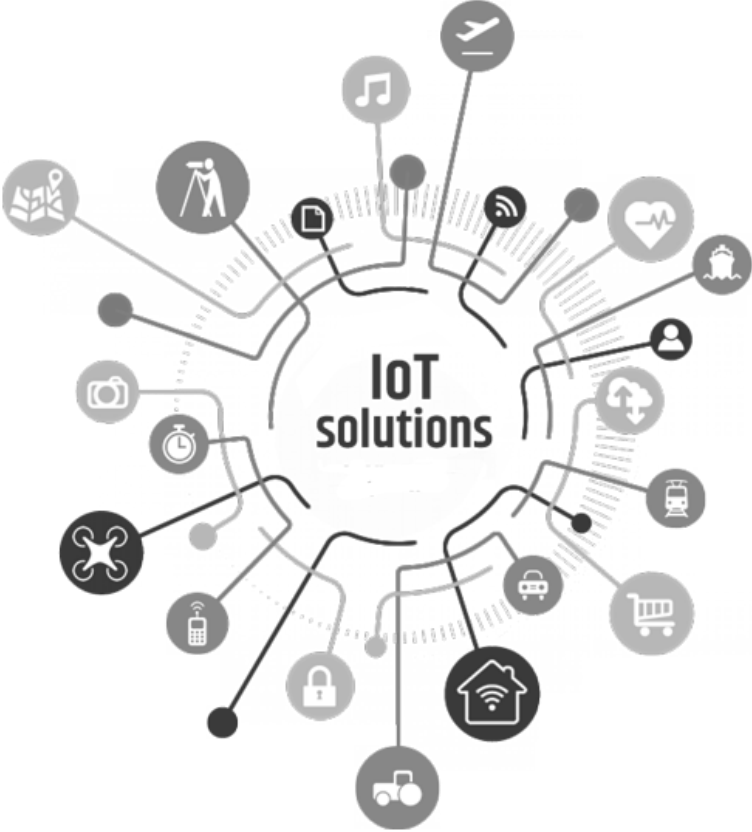


## DIGITAL TWIN

A fit for purpose digital representation of an asset to capture real time data throughout (parts of) its life cycle to enhance performance and optimize efficiency (van Baalen, 2019)



# Internet of things



# WHY DIGITAL TWINS?



BIM  
**B**

Vs.

DIGITAL TWIN

BIM

+

IOT

=

DIGITAL TWIN



# NOW Digital Twin?

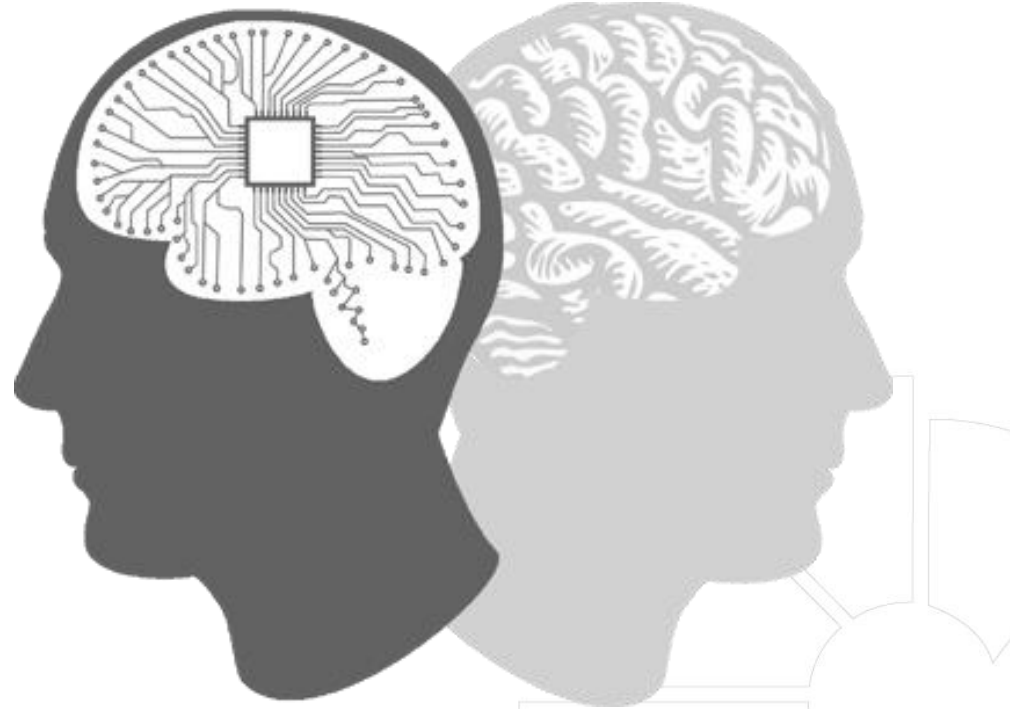
BIM + IOT + AI



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# AI for digital twin

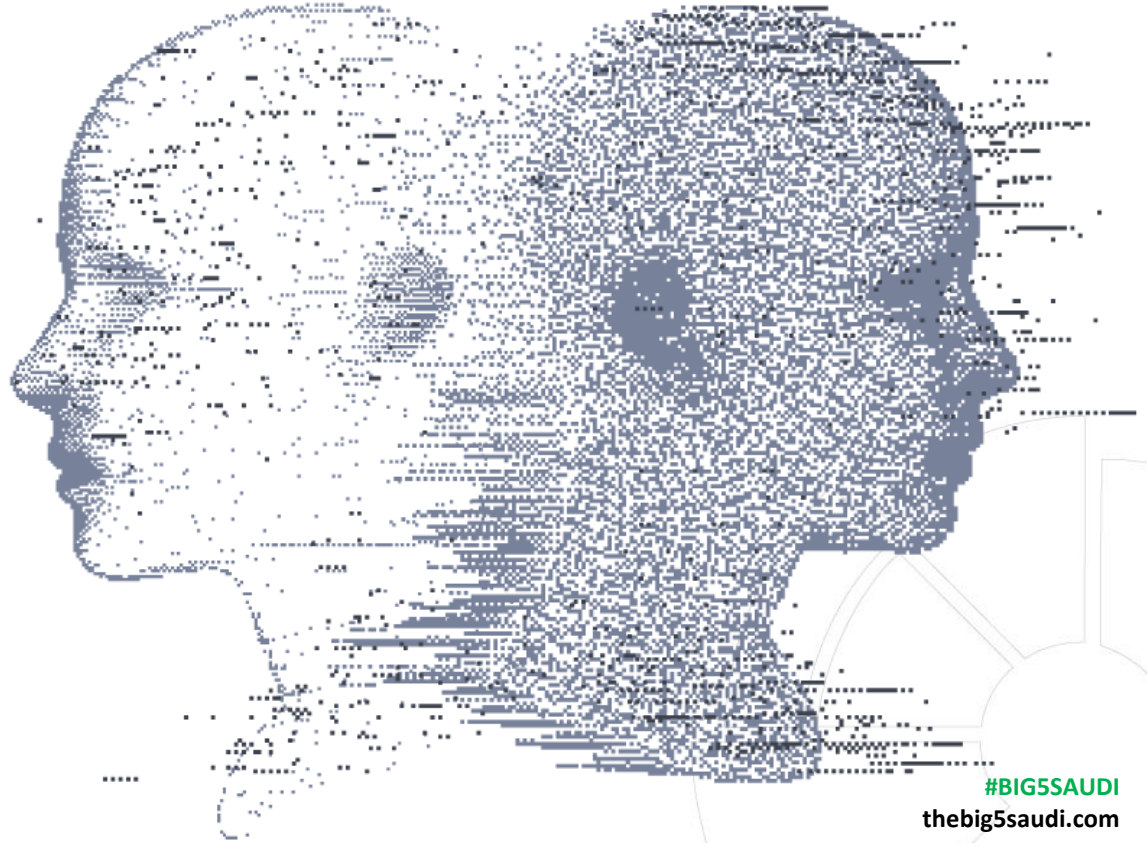
- System prediction
- Decision making



# Digital Twin levels



- Descriptive
- Informative
- Predictive
- Comprehensive
- Autonomous

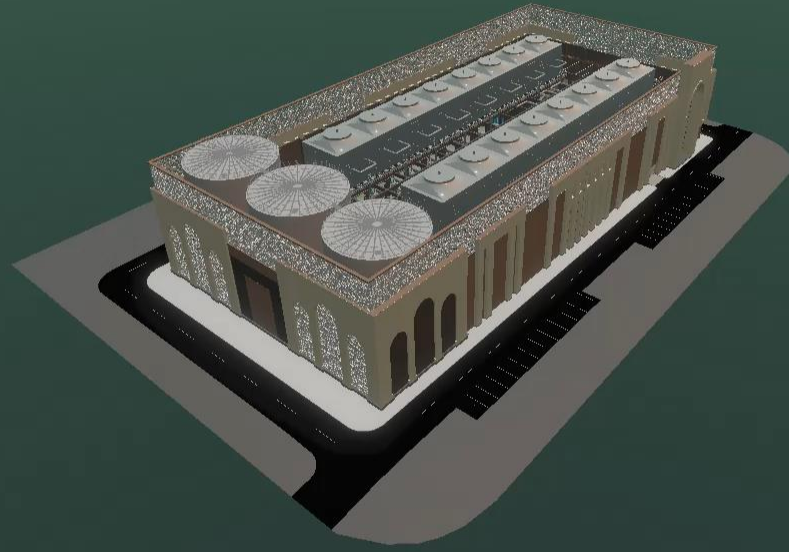


# Digital Twin for FM









Section



pipe line





# AI : Artificial Intelligence



**BIM applications that  
integrate AI will become  
BIM Super Apps.**



# APPLICATIONS





ChatGPT



**We can use this engine to use python, C# scripts for Revit dynamo and API.**

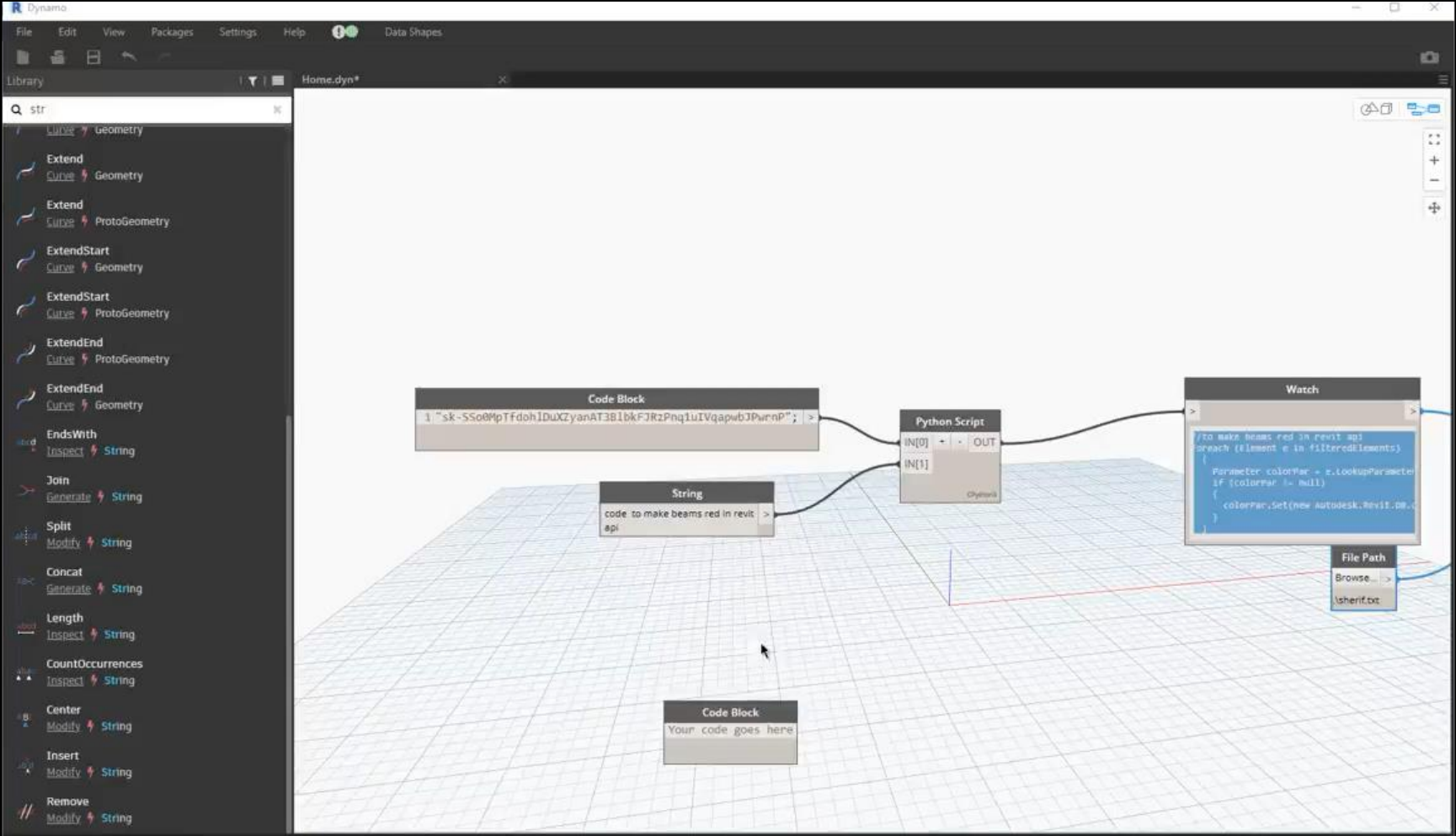


# ChatGPT and dynamo



First option used open ai api to create python scripts in dynamo and you can use this scripts to link it with other dynamo nodes







# ChatGPT



Now we can use ChatGPT to write C# codes to use it in Revit API development Here is some samples :

We used it to get solid from element

Create beams

Create wpf for our plugins

Make documentation for codes

ME

## How to get solid from element in revit api c#



To get a solid object from an element in the Revit API using C#, you can use the following steps:



1. First, you will need to get a reference to the element that you want to extract the solid from. You can do this by using the `Document.GetElement()` method, which takes an element id as an argument and returns a reference to the element.
2. Once you have a reference to the element, you can use the `GetGeometryObjectFromReference()` method of the `GeometryElement` class to get a reference to the geometry object associated with the element.
3. Next, you can use the `OfType<Solid>()` extension method to filter the geometry object collection and return only the solid objects.
4. Finally, you can use a `foreach` loop to iterate over the collection of solid objects and perform any necessary operations on them.

Here's an example of how this might look in code:

Copy code

```
Element element = doc.GetElement(elementId);
GeometryElement geomElem = element.get_Geometry(new Options());

foreach (Solid solid in geomElem.OfType<Solid>())
{
    // Perform operations on the solid object here
}
```

Here is some example code that demonstrates how this can be done:

Copy code

```
using Autodesk.Revit.DB;

// Get all the pipes in the project
FilteredElementCollector pipesCollector = new
FilteredElementCollector(doc).OfClass(typeof(Pipe));

// Create a list to store the pipes in the same network as the specific pipe
List<Pipe> connectedPipes = new List<Pipe>();

// Iterate through the collection of pipes
foreach (Pipe pipe in pipesCollector)
{
    // Get the list of elements connected to the pipe
    IList<ElementId> connectedElementIds = pipe.GetConnectedElements();

    // Check if the specific pipe is present in the list of connected elements
    if (connectedElementIds.Contains(specificPipe.Id))
    {
        // If the specific pipe is present, add it to the list of connected
        pipes
        connectedPipes.Add(pipe);
    }
}

// The connectedPipes list will now contain all the pipes that are connected to
the specific pipe
```



+ New chat

Greeting Help Request

Clear conversations

Dark mode

OpenAI Discord

Updates & FAQ

Log out

```
Line line = Line.CreateBound(startPoint, endPoint);

// Create the beam
FamilySymbol beamType = // Get the desired beam type from the document
doc.Create.NewFamilyInstance(line, beamType, StructuralType.Beam);

transaction.Commit();
```

This code creates a new transaction, defines the start and end points of the beam, creates a line to represent the beam, and then creates the beam using the Create.NewFamilyInstance method, passing in the line, beam type, and structural type.

Note that you will need to get the desired beam type from the document before creating the beam, and also that the transaction will need to be committed to confirm the new beam.

Keep in mind that this is a basic example, and there are many other options and parameters that can be set when creating a beam. You may want to consult the Revit API documentation for more information.

Regenerate response

h

## Veras: AI-based renderer for Revit models

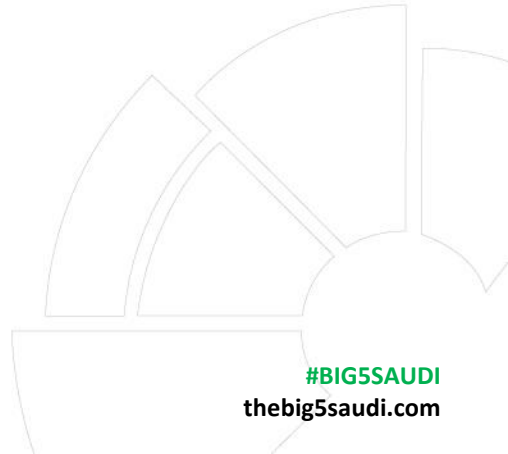
Artificial intelligence (AI) is coming to the AEC market and will impact all areas of design. So far, the applications that have most vividly captured the public imagination have been image creation tools such as DALL-E and Midjourney, and writing tool ChatGPT, but there is so much more yet to come. In fact, AI is already automating an amazing range of creative activities. When used well, the results seem almost like magic.



Veras can generate very impressive photorealistic images, something that could be useful in presentations to clients. It also can apply materials impressively, but in order to get the best results, as with all software, it requires experimentation for the user to get to grips with how it obeys inputs.







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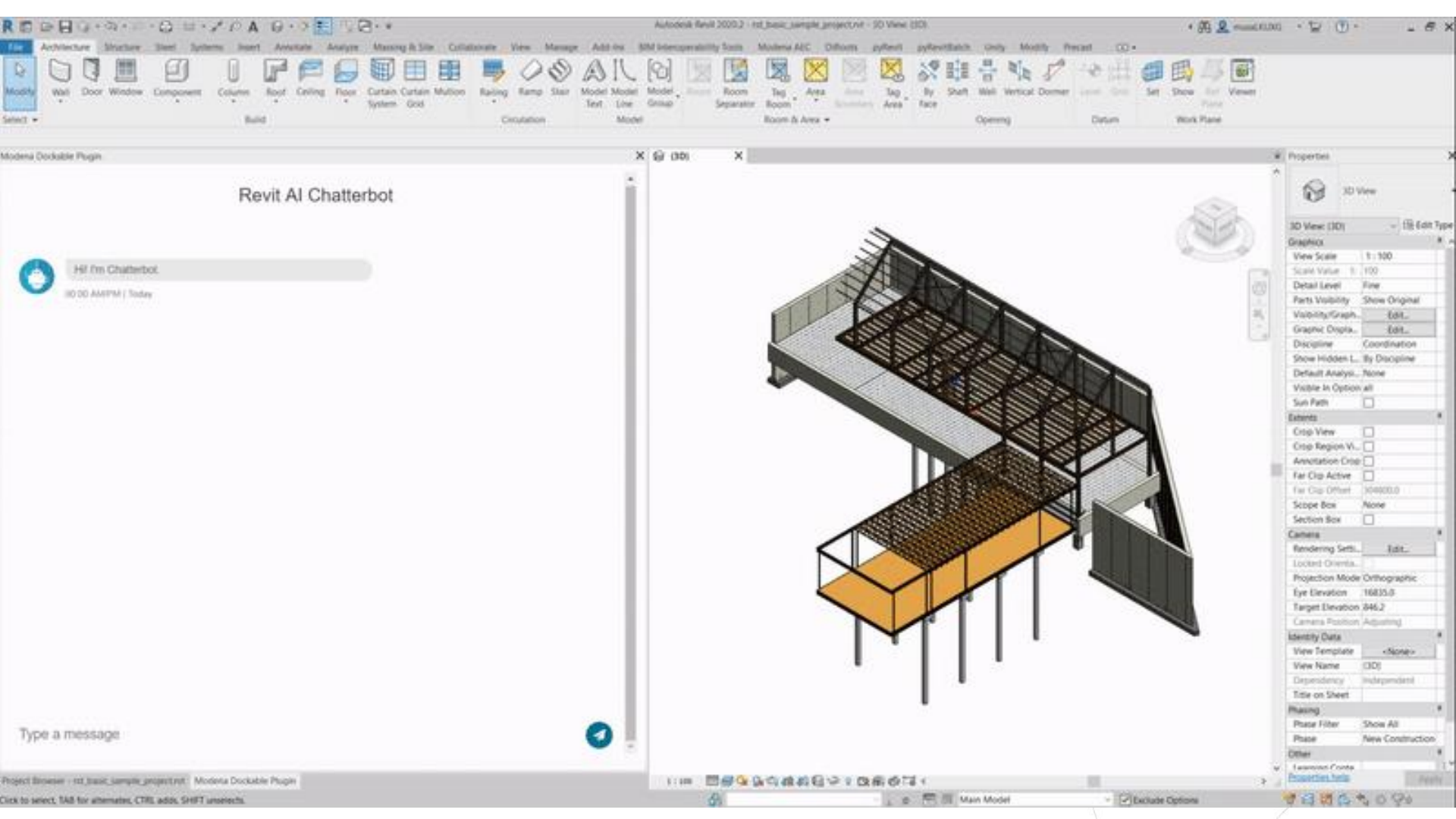


# AI Chatbot in Revit using Python



**AI chatbots** develop their answers to complicated questions using natural language processes and machine learning. These Chatbots operate more efficiently the more they are trained which means the more they are taught the more efficient the response to the user will be.









# Aurivus – SCAN to BIM (Pointcloud to BIM) AI



The aurivus AI understands structured and unstructured point clouds. It searches for parts and inserts BIM attributes directly into the point cloud. Even a previous cleanup is not necessary any more





  
 Load point cloud    Toggle object transparency

aurivus scan to bim

Properties

Level 1    Level 1    {3D}    {3D}    Level 1    {3D}

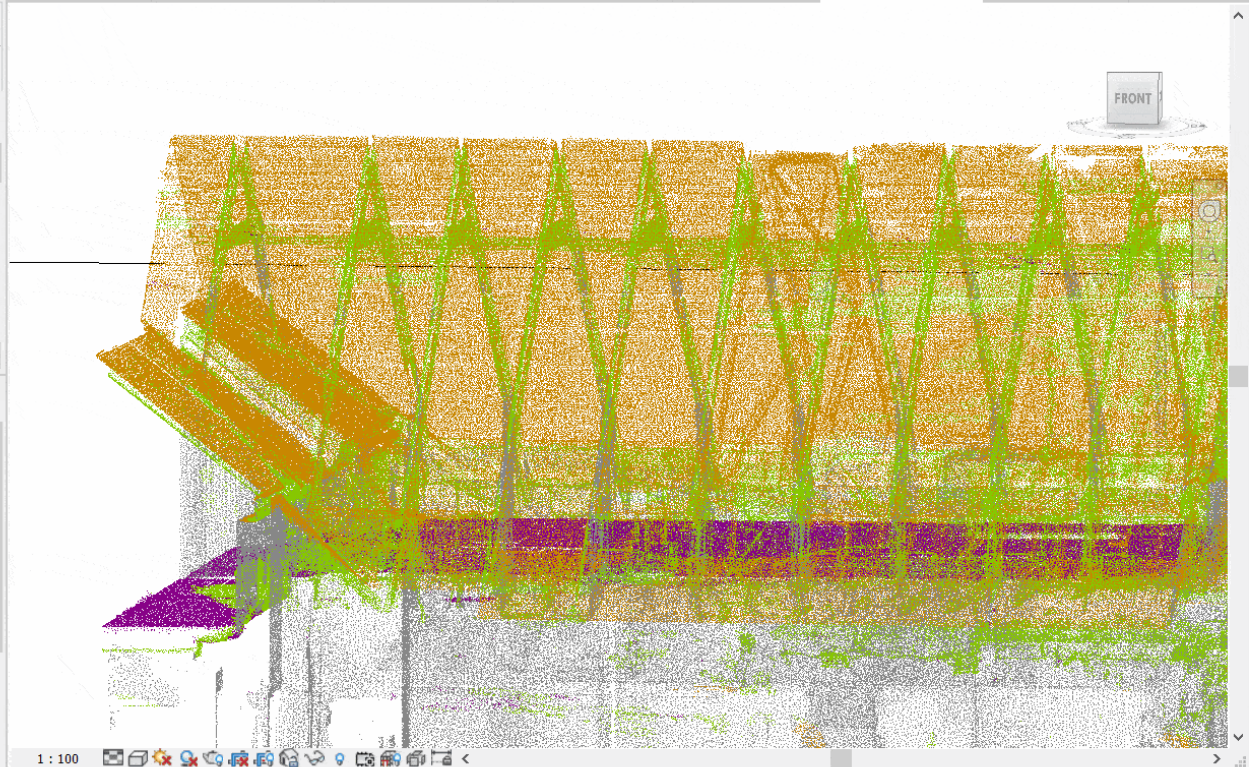
3D View

3D View: (3D)    Edit Type

Graphics

View Scale	1 : 100
Scale Value	1 : 100
Detail Level	Medium
Parts Visibility	Show Original
Visibility/Grp...	Edit...
Graphic Displa...	Edit...
Discipline	Coordination
Show Hidden L...	By Discipline

Properties help    Apply



aurivus

Classes

<input type="checkbox"/>	Walls
<input checked="" type="checkbox"/>	Floors
<input type="checkbox"/>	Windows
<input type="checkbox"/>	Doors
<input type="checkbox"/>	Plumbing Fixtures
<input type="checkbox"/>	Speciality Equipment
<input type="checkbox"/>	Casework
<input type="checkbox"/>	Lighting Fixtures
<input type="checkbox"/>	Furniture
<input type="checkbox"/>	Mechanical Equipment
<input type="checkbox"/>	Site
<input checked="" type="checkbox"/>	Structural Framing
<input type="checkbox"/>	Structural Columns
<input checked="" type="checkbox"/>	Roofs

Project Browser - Project3

Views (all)

- Floor Plans
  - Level 1
  - Level 2
  - Site
- Ceiling Plans
  - Level 1
  - Level 2
- 3D Views
- Elevations (Building Elevation)
  - East
  - North
  - South
  - West
- Legends
- Scheduler/Quantities (all)

The screenshot shows the Bandicam application window. The title bar reads "BANDICAM UNREGISTERED". The interface includes a top toolbar with icons for screen recording, webcam, game capture, microphone, volume, mouse, keyboard, and a large red "REC" button. Below the toolbar, the main content area is titled "Screen Recording - Fullscreen" and provides instructions for capturing the entire display. A sidebar on the left contains navigation options: Home, General, Video, Image, and About. At the bottom of the window, there is a "BANDICUT" button and a tip about recording computer and voice sounds.

1920x1080 - (0, 0), (1920, 1080) - Display 1

Home | Get Started | Videos | Images

General | Video | Image | About

### Screen Recording - Fullscreen

This mode allows you to record the whole screen of your display.

1. Choose a monitor to be captured.
2. Click the 'REC' button or press the record hotkey.

**REC** Start recording [View online help](#)

Record/Stop: F12      Image capture: F11

**BANDICUT**

How to record 'computer sound' and 'your voice' at the same time

Activate Windows  
Go to Settings to activate Windows.



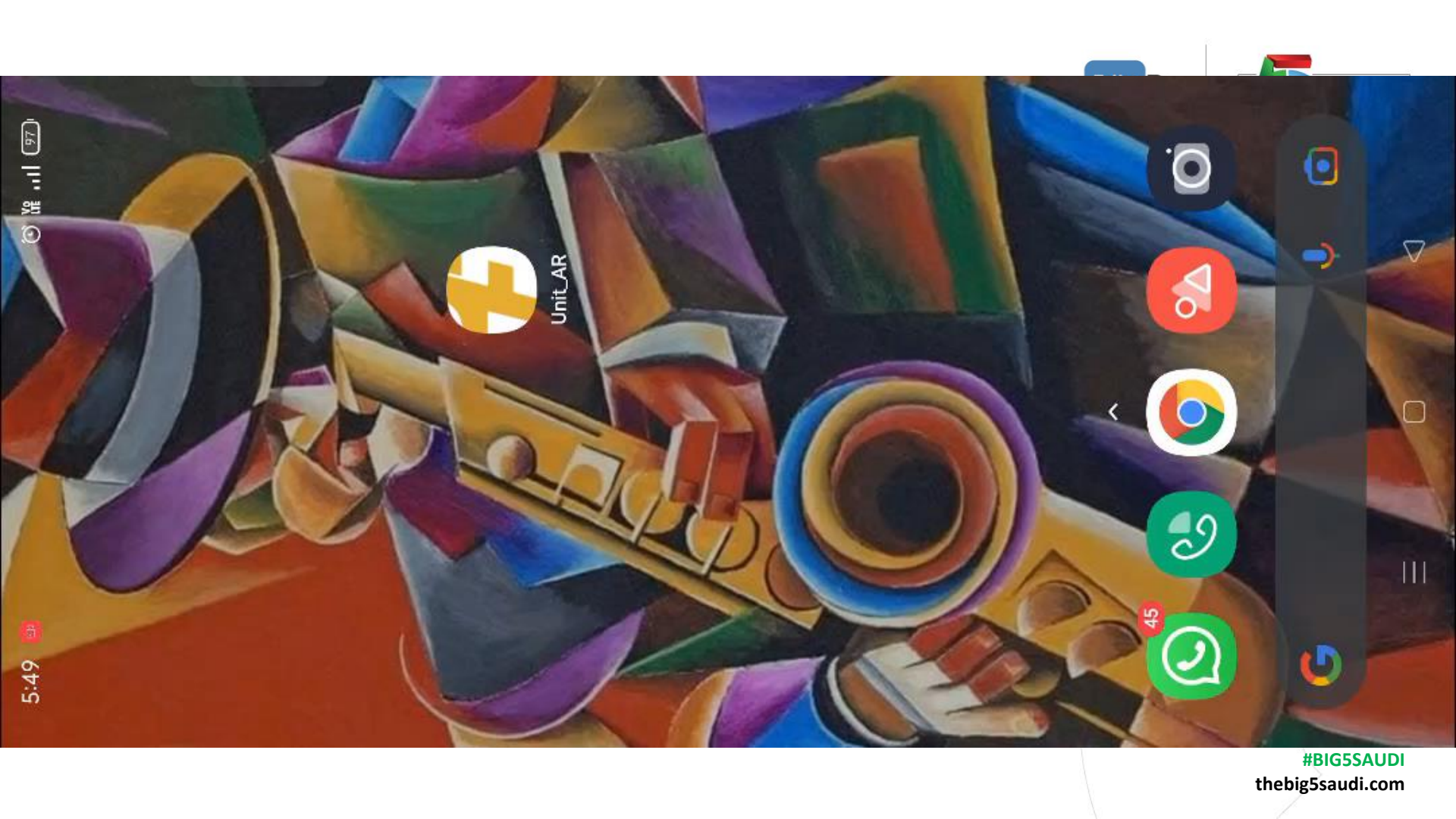
# What Is Next





# Augmented Reality





5:49 24 97



Unit\_AR

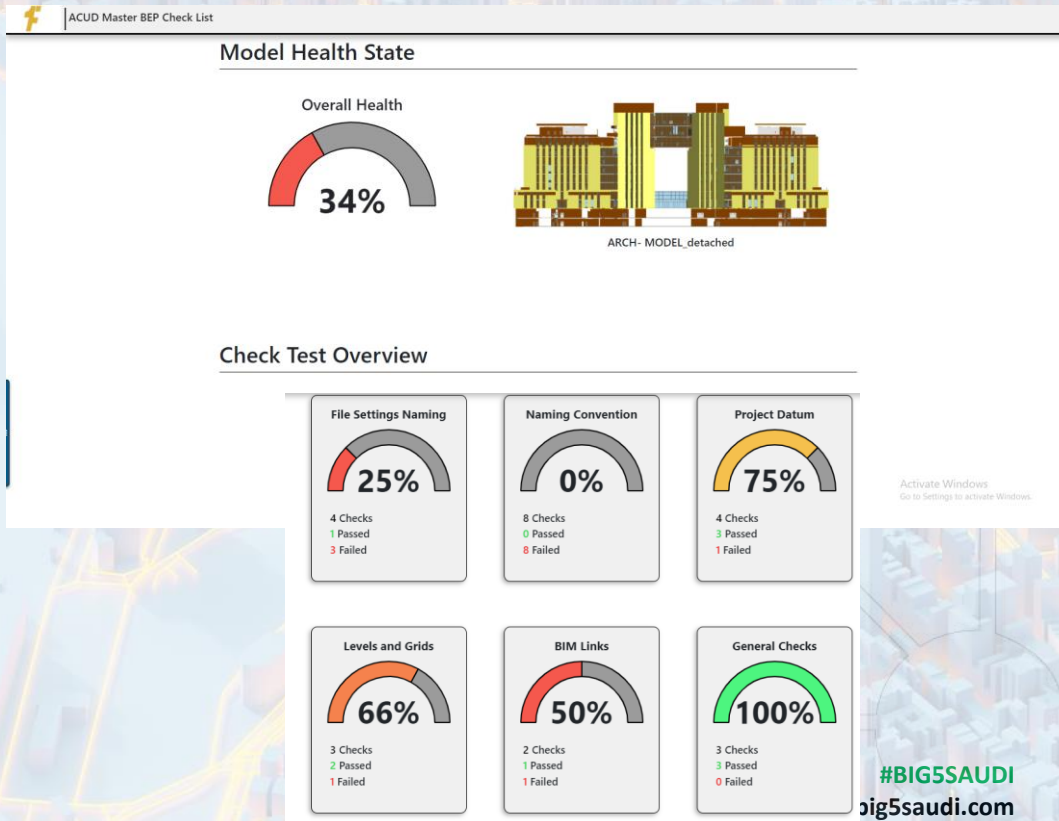




LOL  
ComediHa!

# Model Checker

## Model Health Check



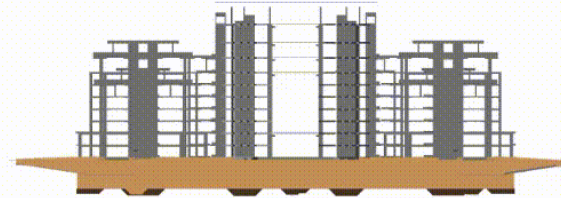
- Model health meters
- Check main groups
- Check group detailed checks
- Check list documents
- Interactive 3D orientation
- Export to HTML report

## Model Health State

---

Overall Health

65%



ACUD-SC-09A-3DM-S-500-B\_detached

## Check Test Overview

---

### Main Check Groups:

- File Settings Naming
- Naming Convention
- Project Datum







Properties

DV-SAVE TO CENTRAL VIEW (3D)

3D View

3D View: (3D) Edit Type

**Graphics**

View Scale	1 : 100
Scale Value 1:	100
Detail Level	Medium
Parts Visibility	Show Original
Visibility/Graphics Overrides	Edit...
Graphic Display Options	Edit...
Discipline	Coordination
Show Hidden Lines	By Discipline
Default Analysis Display Style	None
Show Grids	Edit...
NAB-View Classification	
Sub-Discipline	
Sun Path	<input type="checkbox"/>

**Extents**

Crop View	<input type="checkbox"/>
Crop Region Visible	<input type="checkbox"/>
Annotation Crop	<input type="checkbox"/>
Far Clip Active	<input type="checkbox"/>
Far Clip Offset	304800.000
Scope Box	None
Section Box	<input type="checkbox"/>

**Camera**

Rendering Settings	Edit...
Locked Orientation	<input type="checkbox"/>
Projection Mode	Orthographic
Eye Elevation	189444.691
Target Elevation	113619.134
Camera Position	Adjusting

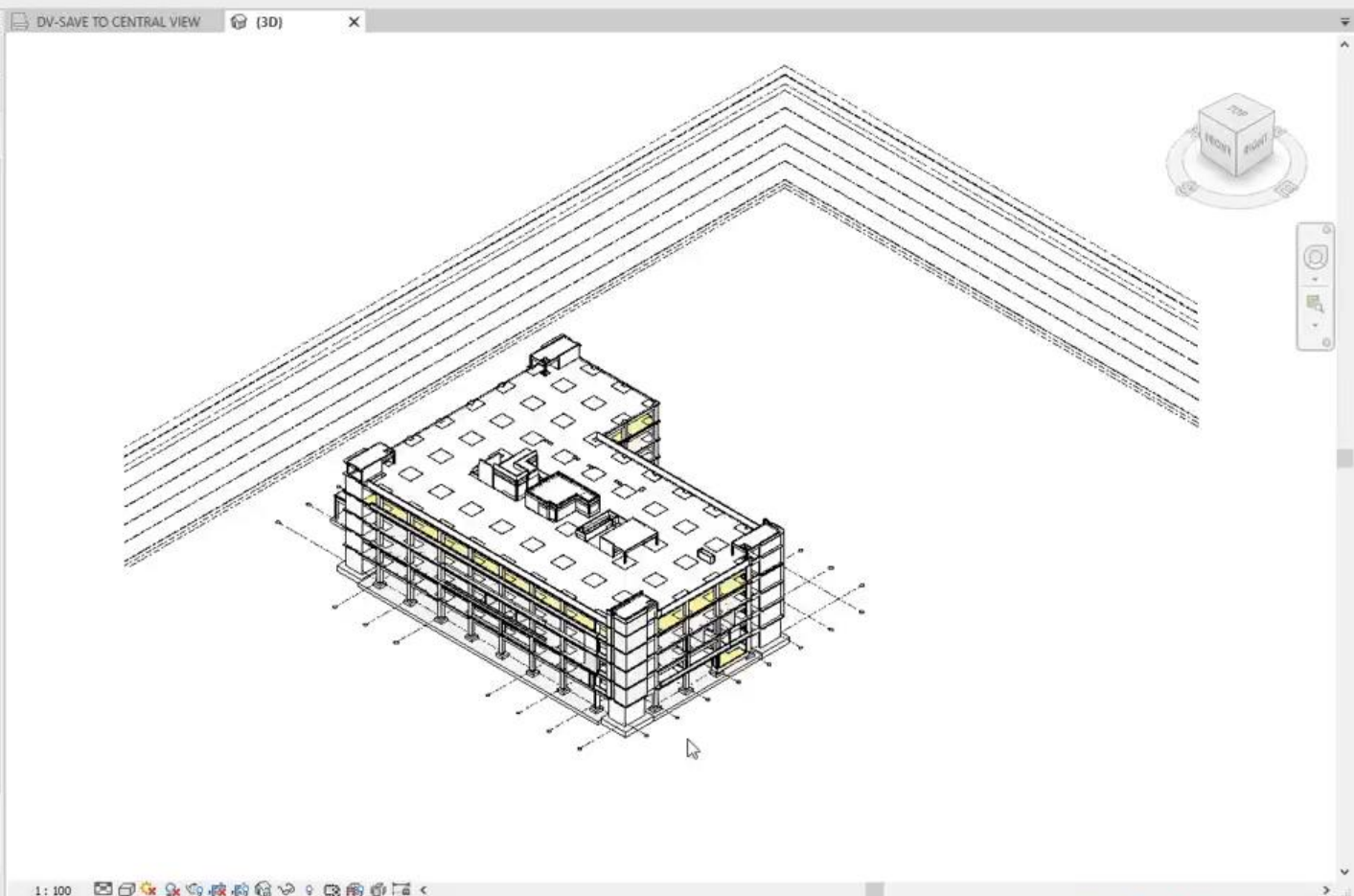
**Identity Data**

View Template	<None>
View Name	(3D)
Dependency	Independent
Title on Sheet	

**Phasing**

Phase Filter	Show All
Phase	New Construction

[Properties help](#) Apply





# **F**IRST OPTION ENGINEERING SERVICES

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**E-Mail : [Kamal@firstoption-es.com](mailto:Kamal@firstoption-es.com)**

**First Option | Executive Manager**

**Cell phone :+201004186970**



# THANK YOU

