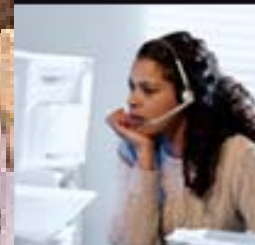
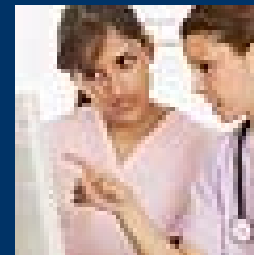


# Building Information Modeling Where do we begin ?



***An Overview of BIM and the steps to  
successfully implement the process***

# Introduction

Ken Schriever  
IS Director of Network Services

Nathan Haas  
Senior Revit /CAD Technician

# Discussion Topics

- What is BIM
- What is Revit
- Revit Pros & Cons
- Where are all the Revit Families
- Family Tips & Tricks
- What can Revit do for you
- Things to consider before diving into BIM
- Revit Training and Implementation
- Helpful Revit Resources

# What is BIM?

It's Not Just a Fancy 3D Drawing!

## **National BIM Standard (NBIMS) Definition of BIM**

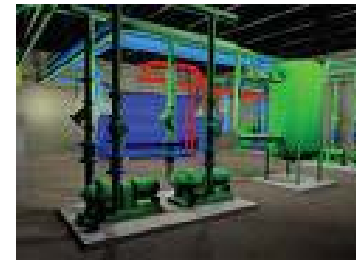
A Building Information Model (BIM) is a digital representation of physical and functional characteristics of a facility. As such, it serves as a shared knowledge resource for information about a facility forming a reliable basis for decisions during its lifecycle from inception onward.

A basic premise of BIM is a collaboration by different stakeholders at different phases of the lifecycle of a facility to insert, extract, update, or modify information in the BIM process to support and reflect the roles of that stakeholder. The BIM is a shared digital representation founded on open standards for interoperability.

# BIM - Multiple Platforms

## **Revit (Autodesk)**

Architecture | Structure | MEP



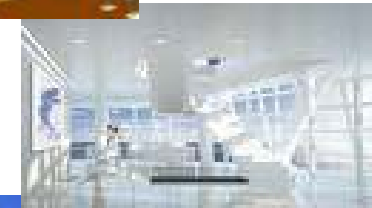
## **Bentley**

Architectural | Structural |  
Mechanical | Electrical



## **Gehry Technologies**

Architecture/Structures | MEP



## **ArchiCAD (Graphisoft)**

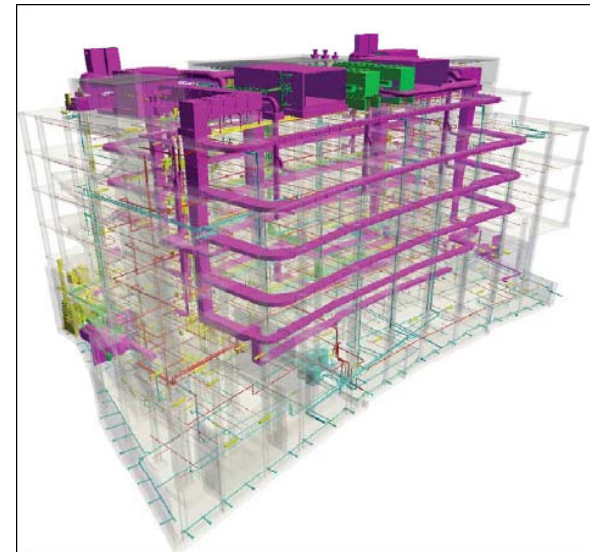
Architectural | Structural



# Interoperability With Clients and Partners?

## Client Standards and Requirements

- U.S. Government/Military Projects
- Architect's Platform?
- Structural Engineer's Platform?
- Your Platform?



# Interoperability Standards

## **IFC (Industry Foundation Classes)**

- Open standard for BIM models
- Major platforms already comply

## **NBIMS (National Building Information Model Standards)**

- Defines what constitutes a “true” BIM model
- Establishes standard definitions for BIM exchange

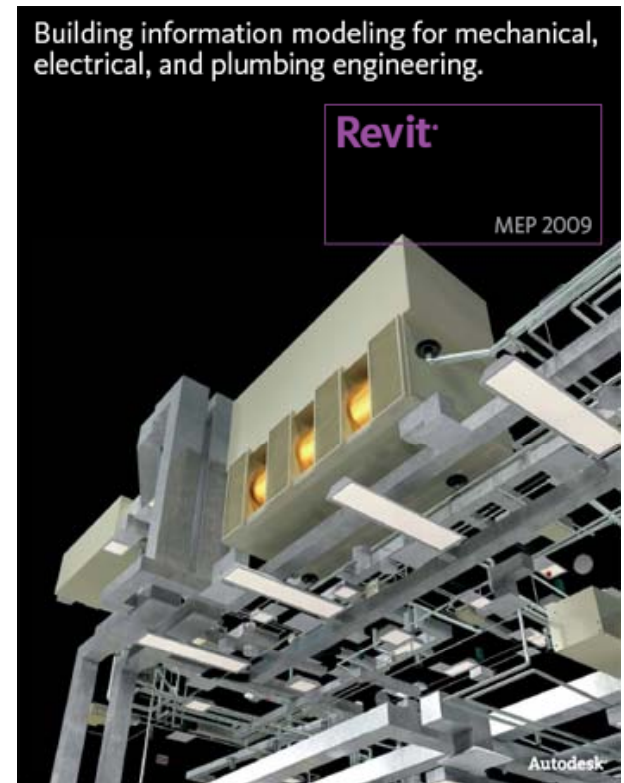
# What is Revit

Autodesk Revit is Building Information Modeling software for Microsoft Windows, currently developed by Autodesk, which allows the user to design with parametric modeling and drafting elements. Building Information Modeling is a new **Computer Aided Design (CAD)** paradigm that allows for intelligent, 3D and parametric object-based design. In this way, Revit provides full bi-directional associativity.

A change anywhere is a change everywhere, instantly, with no user interaction to manually update any view. A BIM model may contain the building's full life cycle, from concept to construction to decommissioning. This is made possible by Revit's underlying relational database architecture which its creators call the parametric change engine.

**Ross Baruzzini**

Ken Schriever



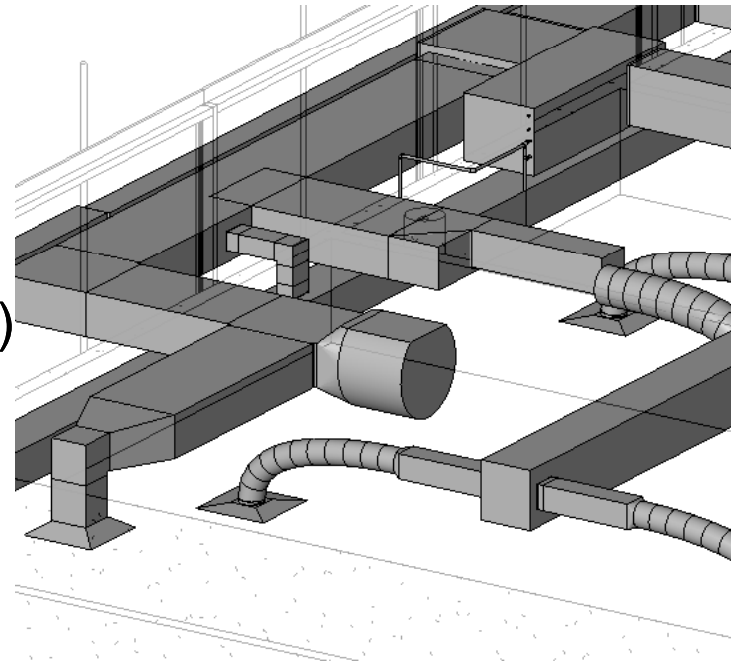
# Revit MEP Pros & Cons

## Cons

- Hardware Cost (Use i7 Processor)
- Software Cost (Free Download)
- Training & Conversion (Online Tutorials)
- Customization (Setup Template)

## Pros

- Efficiency
- Bidirectional Associativity
- Building Analysis / Interference Checking
- IFC Format for Interoperability
- IPD Integrated Project Delivery



# INTEGRATED PROJECT DELIVERY (IPD)

A project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction.

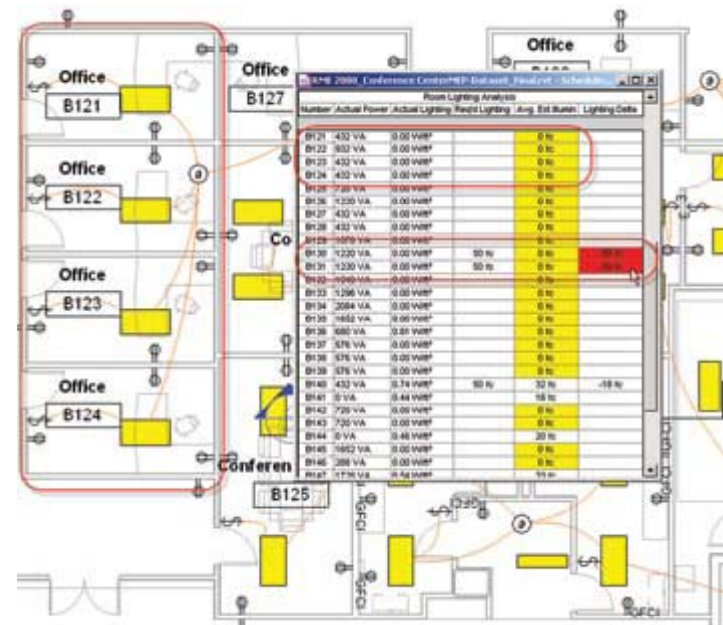
Definition from the Integrated Project Delivery Task Force - an interdisciplinary group sponsored by McGraw-Hill Construction and the AIA California Council.

- Early Collaboration
- Clear Communication



# Bidirectional Associativity

. Storing your information in a single, consistent database helps to ensure that your entire model is always up-to-date. Parametric technology automatically manages all change propagation and keeps your project on track. The ability to change a schedule and automatically update the model is a key benefit of using Revit MEP software.



# Discipline and Equipment Zones

**Element Properties**

Family: System Family: Room

Type: Room

Type Parameters: Control all elements of this type

Parameter	Value

Instance Parameters - Control selected or to-be-created instance

Parameter	Value
<b>Electrical - Lighting</b>	
Average Estimated Illumination	32.05 Fc
Room Cavity Ratio	2.656766
Lighting Calculation Workplane	2' 6"
Ceiling Reflectance	0.750000
Wall Reflectance	0.500000
Floor Reflectance	0.200000
Required Lighting Level	35.00 Fc
<b>Electrical - Loads</b>	
Design HVAC Load per area	0.00 W/ft <sup>2</sup>
Actual HVAC Load	0.00 VA
Design Other Load per area	0.00 W/ft <sup>2</sup>
Actual Other Load	0.00 VA
<b>Mechanical</b>	
Zone	8



Parameter	Value
<b>Mechanical</b>	
Zone	8
<b>Mechanical - Airflow</b>	
Specified Supply Airflow	0 CFM
Calculated Supply Airflow	Not Computed
Actual Supply Airflow	750 CFM
Return Airflow	Specified
Specified Return Airflow	0 CFM
Actual Return Airflow	0 CFM
Specified Exhaust Airflow	0 CFM
Actual Exhaust Airflow	0 CFM
<b>Dimensions</b>	
Area	531.82 SF
Perimeter	97' 7"
Unbounded Height	14' 0"



# Data Components are Intelligent

## Every element is intelligent

- Defined parameters
- Communication between disciplines
- Elements communicate
- Elements are inter-changeable
- All elements are accounted for

## Cons

- Families take time to create.
- You must have an established template  
With established parameters.

# PROCESS OF WORKING WITH IFC FORMAT

## IN/OUT OF REVIT

- Architect produces model in Archicad
- Archicad model exported out to IFC format
- Integrity of IFC model checked in Solibri model checker file size is reduced
- IFC model is imported into Revit and linked into MEP model
- MEP main design elements produced (duct work, piping etc) in 3D
- MEP model exported back to IFC and issued back to Architect, along with DWF
- Coordination and collaboration by Architect using Navisworks
- Revit MEP – The Basics
- All Details & Schematics were produced

## ISSUES FROM WORKING WITH IFC FORMAT

- Still a way to go for 100% integrity of IFC model geometry
- Export/Import settings limited in both Revit & Archicad
- File size of Arch model once imported to Revit is quite large (200MB+)

# Where are all the Revit Families

Revit Families are intelligent 3D blocks that are used to build your BIM model.

MEP Families were once the roadblock. Family resources are available and growing daily. What can I do to get the families I need?

- Develop a partnership with your manufactures to get their families.

<http://seek.autodesk.com/>

[www.Broutek.com](http://www.Broutek.com)

[www.revitcity.com](http://www.revitcity.com)

[www.revitfamilyman.com](http://www.revitfamilyman.com)

# FAMILIES – TIPS & TRICKS

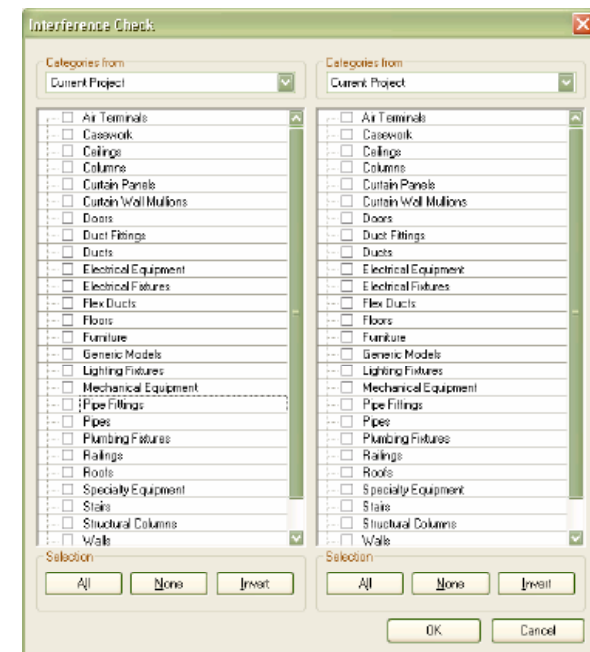
- Be sure to start from the right family template
  - Ceiling Based
  - Wall Based
  - Floor Based
  - Face Based
- Work Plane-based families
- Continually test the parameters
- Use Reference planes

# Multi-Discipline Collaboration

## Interference Checking

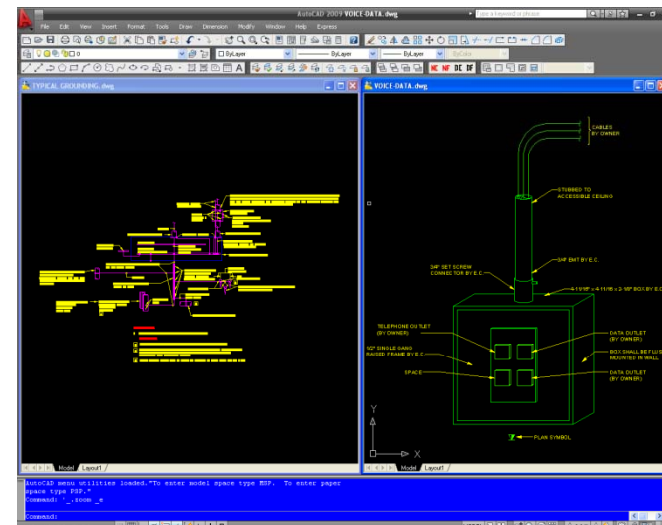
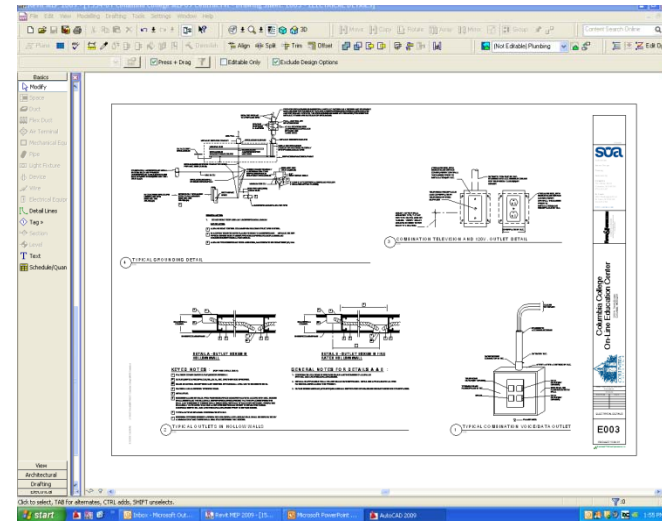
Identifies conflicts between elements that exist internally within the MEP model, or between elements that exist both within the MEP (host) model and “linked” models (architectural and structural).

Multiple and independent interference checking can be established.



# AutoCAD & Revit

Details and Diagrams are a perfect Example of incorporating traditional 2D AutoCAD into your fancy new Revit BIM packages. You can reference CAD details to be dynamic.





# Things to consider before diving into BIM

## Questions you should ask yourself

- Are you Ready
- Are your Clients Ready
- Do you have the Capabilities
  - Hardware
  - Software
- Do you have a Plan



# Revit Training and Implementation

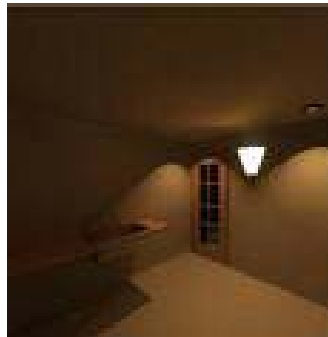
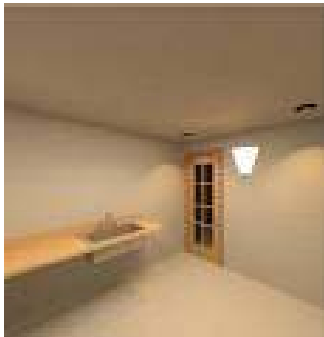
When is a good Time to start training?

## Steps for Successful Revit Training

- Target a Project
- Schedule and Obtain Training
  - Get at least a few users trained on Family Editing
- Start Project in Revit POD
- Invest in Pre and Post Project Training

# Marketing Tools

- Renderings
- Improvement Tracking
- Maintenance Schedules
- Design Build
- Collaboration



KOSS BARUZZINI

Ken Schriever

# Navisworks

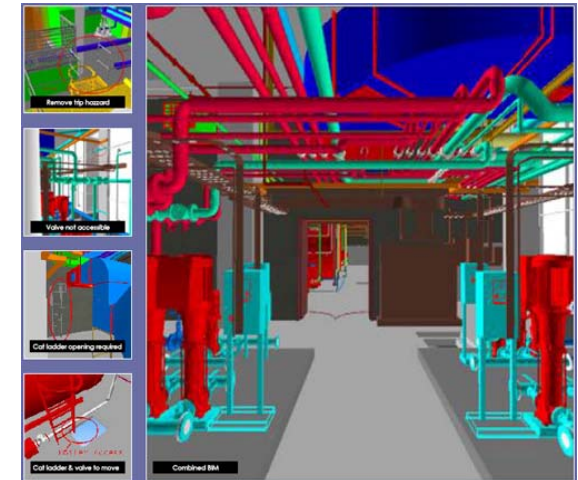
Autodesk® Navisworks® software solutions enable project design, engineering, construction, and manufacturing professionals to unite contributions into a single building or process plant model.

## Architecture, Engineering & Construction

Autodesk Navisworks project review software for architecture, engineering, and construction is at the heart of building information modeling (BIM) and process plant workflows.

## Manufacturing

Autodesk Navisworks software for manufacturing, part of the Autodesk solution for Digital Prototyping, helps you to experience your factory before it's built.



### Features

- Free\*\* viewer for easy opening of .NWD and 3D DWF files
- Enables viewing of model hierarchy, object properties and embedded review data, including viewpoints, animations, redlines, and comments
- Includes full set of navigation tools: Walk; Look Around; Zoom; Zoom Box; Pan; Orbit; Examine; Fly; Turntable
- Supports real-time display of materials and lighting

# Revit Blog Sites

[ARCHIN3D](#)  
[Autodesk Revit](#)  
[Beyond the Silos](#)  
[BIM & BEAM](#)  
[BIM Videos](#)  
[BIMtionary](#)  
[buildz](#)  
[CADsmart](#)  
[CADsoft](#)  
[Design Reform](#)  
[Do Revit](#)  
[Green Revit](#)  
[Inside the Factory](#)  
[iRevit](#)  
[Knowing CAD](#)  
[LabArchitect](#)  
[Malleristic](#)

[Revitation](#)  
[Marathon Drafting](#)  
[Revit 24/7](#)  
[Revit Anonymous](#)  
[Revit ArchCenter](#)  
[Revit Bimmer](#)  
[Revit Clinic](#)  
[Revit Coaster](#)  
[Revit Family Man](#)  
[Revit for Real](#)  
[Revit Implementation](#)  
[Revit in Plain English](#)  
[Revit OpEd](#)  
[Revit Rants](#)  
[Revit Rocks](#)

[Revit Rockstar](#)  
[Revit the Kid](#)  
[Revit TOTD](#)  
[Revit Unplugged](#)  
[Revit USA](#)  
[Revit Zen](#)  
[Revit Zone](#)  
[Revit3D.com](#)  
[Revitalize](#)  
[Revitology](#)  
[Revitup](#)  
[The Low End](#)  
[theBIMman](#)  
[Waterman](#)  
[What Revit Wants](#)  
[Zooming](#)

# Revit Forums & News

- [AECBytes Reviews](#)
- [ArchiCAD vs Revit](#)
- [AUGI Revit Forum](#)
- [BIM Storm](#)
- [CAD Digest](#)
- [Cadopolis](#)
- [CadPlan Resource List](#)
- [Revit Community](#)
- [Revit Frappr](#)
- [RevitCity Forum](#)
- [Reviting](#)
- [Revitopia](#)
- [The Revit Coop](#)

**Ross & Baruzzini**

Ken Schriever

# Helpful Revit Resources

## Blogs

[www.revit3d.com](http://www.revit3d.com)

[www.revitcity.com](http://www.revitcity.com)

[revit.rossbar.com](http://revit.rossbar.com)

[www.revitfamilyman.com](http://www.revitfamilyman.com)

## Revit Resources

[www.Broutek.com](http://www.Broutek.com)

[National BIM Standards](#)

[National CAD Standards](#)



## Autodesk

[Autodesk University](#)

[Customer Council](#)

[GSA BIM Resource](#)

[Knowledge Base](#)

[Partner Products](#)

[Product Activation](#)

[Request Manuals](#)

[Revit Content Library](#)

[Subscription Center](#)

[Suggestion Box](#)

[The Area](#)



# Summary

## **Are you ready for BIM?**

- Multiple platforms
- Assemble your team early
- Don't get overwhelmed
- It's not perfect yet
- It's a collaborative process
- Communication is key

# Questions

