Redefining the Intelligence in BIM: From Information to Integration

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About Farid Nacer

- Solution Architect with Autodesk Consulting.
- Doing Revit since ~2005.
- Integrating data and systems for a lot longer.
- Working with AEC customers in retail, hospitality, food service industries.

Why this class

- BIM/Revit implementations often fail to improve, and sometimes degrade, an organization's ability to manage its data.
- Organizations are choosing the counter-intuitive strategy of putting less, rather than more, data in their Revit models.
- These organizations have improved the quality of their decisions by using integration to access information they need, when they need it.
- This class explains why and how.

About the presentation

- Deals with data and integration.
  - can be dreadfully tedious.
- Will be non-technical.
- Will illustrate concepts.
- Will help you understand enough to ask for more.
- Will include time for Q&A.

Twitter Edition

thinking about putting data in Revit?
better think again

tl;cs*

* too long, can't stay

Don’t put data in Revit *unless* you need it there.

Don’t put data in Revit *before* you need it there.

Leave data in the system responsible for its *maintenance*.

Get data *when* you need it and as *often* as you need it.

If you can, use *web services* to access external data.

Main Feature

it’s about process

Building information modeling

From Wikipedia, the free encyclopedia

Building information modeling (**BIM**) is a process involving the generation and management of digital representations of physical and functional characteristics of places.

it’s about data

bim - Google Search

https://www.google.com/search?sa=X&hl=en&biw=1536&bih=814&site=imghp&tbs=simg:CAESwQEavgELEKjU2AQaAggKDAsQsIynCBo8CjoIAhIU9A2BF_1EN7hTTIYYM_1RbRFvcUkhUaIAi8amrkc1BhorBBprIsmwMp6v

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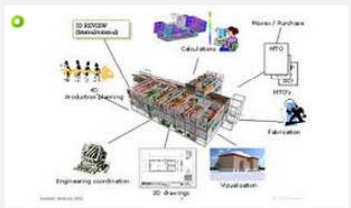
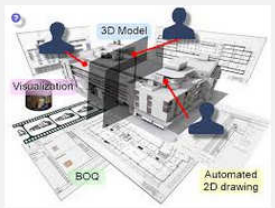
Safe Search

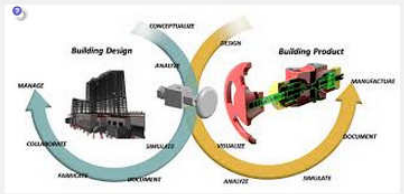
Size | Color | Type | Time | Visually similar | Usage rights | More tools | Clear

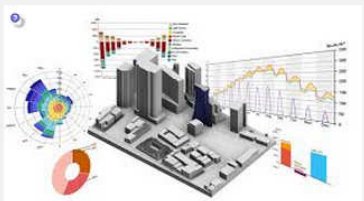
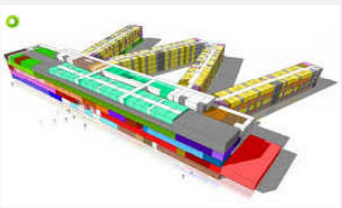
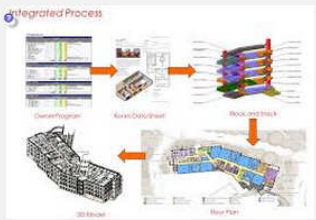


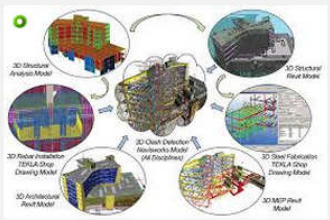
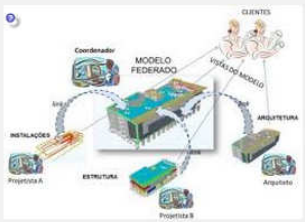


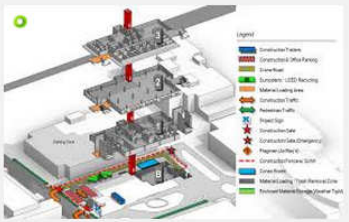


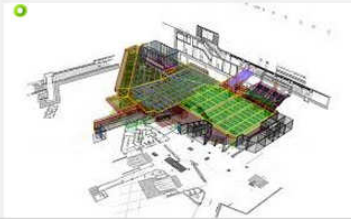






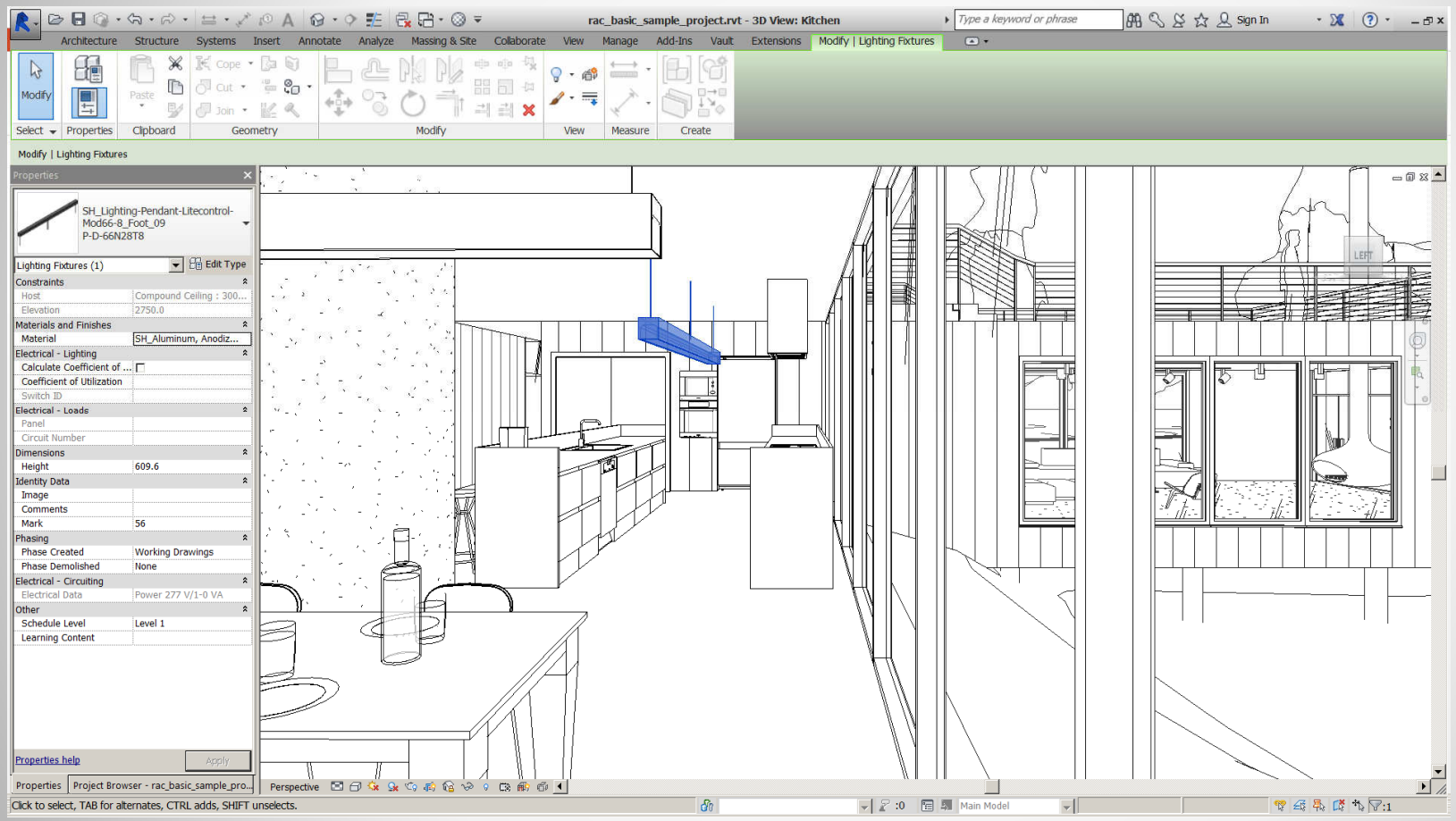




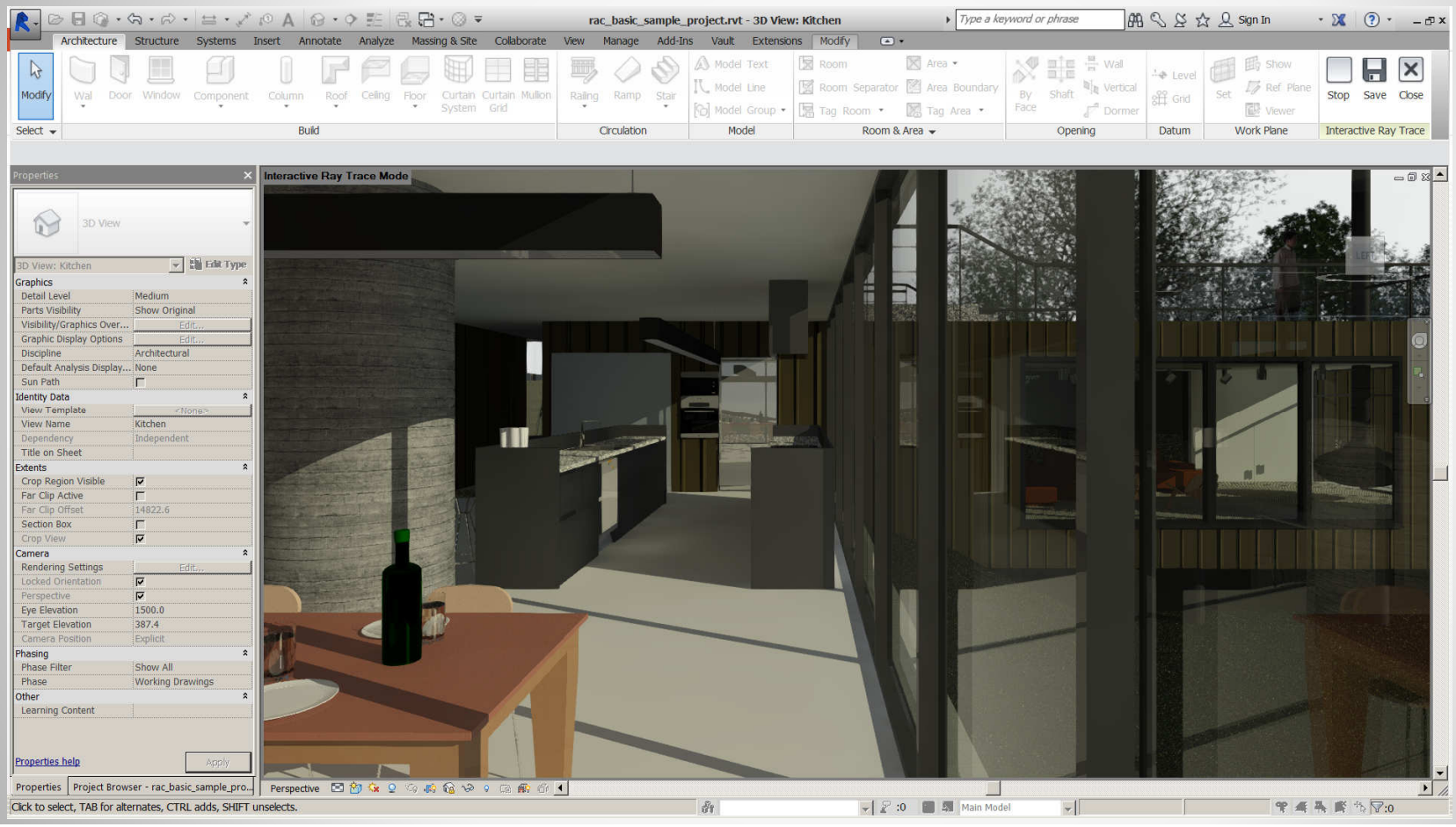



it’s about uses

3D = geometry and data



3D + light and materials



Beyond 3D

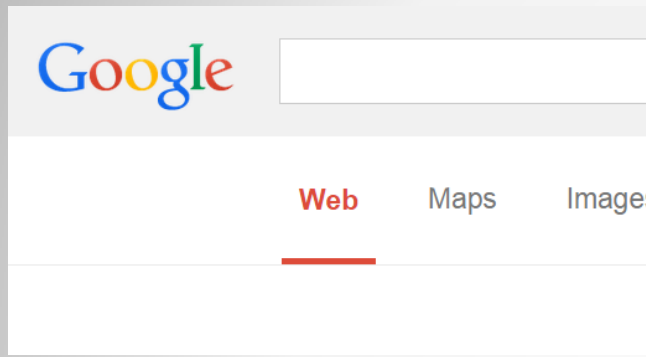
4D BIM = Intelligent linking of individual 3D CAD components or assemblies with time- or schedule-related information.

5D BIM = adds cost information

6D BIM = adds life-cycle information

7D BIM = adds sustainability information

What's after 7D?



8D BIM MODELLING TOOL FOR ACCIDENT PREVENTION THROUGH DESIGN

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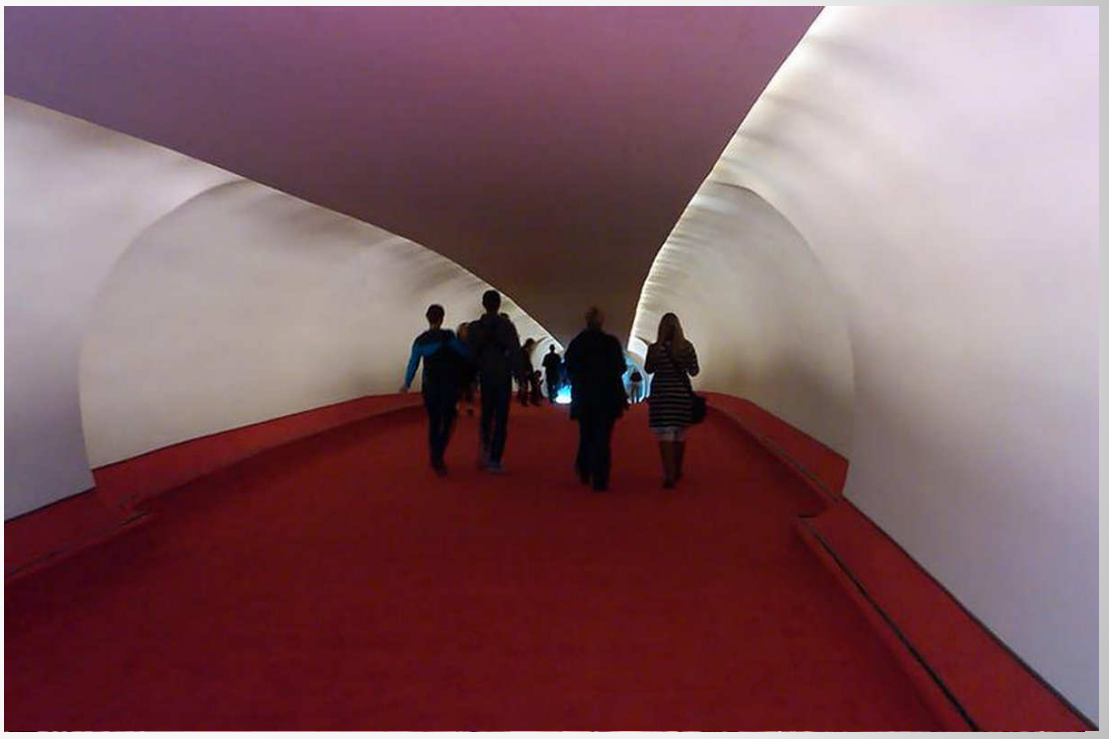
The construction industry's incident rate for workplace injuries has consistently remained at about double that of all other industries. There has long been compelling evidence that many safety risks are created in the early design stage of projects. Hence, it can be argued that one of the most effective means of dealing with a hazard is to eliminate it at source, that is, Prevention through Design (PtD). But until now the tools for effectively managing the links between design and safety on site have not been available. Building information modelling (BIM) is an emerging paradigm in the design and engineering field. BIM has been utilized quite extensively to simulate and optimize designs in view of feasibility studies and stakeholder concerns, value analysis, constructability analysis, sustainability analysis, site operational efficiency and site layout, and facilities management. These studies have confirmed that the utilization of BIM enhanced the optimization of the design to yield the best outcome at the design stage. Nonetheless, the potential of BIM for PtD is yet to be explored. This paper discusses the conceptual model of an 8D modelling tool for PtD.

Keywords: occupational health and safety, building information model.

What's after 7D?

- Safety
- Maintainability
- Acoustics
- Security
- Heat
- Touch
- Smell
- Emotion



the uses dictate the data

Example: Office chair

Could have HVAC equipment

Could have used something else

Example: Office chair

- CAD model
- Manufacturer
- Model
- Color

Example: Office chair

- CAD model
- Manufacturer
- Model
- Color
- Realistic model
- Material definition

The client will be able to see how the office will look.

Example: Office chair

- CAD model
- Manufacturer
- Model
- Color
- Realistic model
- Material definition
- Lead time

Items with long lead times can be ordered ahead of time and be ready when needed (4D).

Example: Office chair

- CAD model
- Manufacturer
- Model
- Color
- Realistic model
- Material definition
- Lead time
- Cost

} The project can stay within budget (5D).

Example: Office chair

- CAD model
- Manufacturer
- Model
- Color
- Realistic model
- Material definition
- Lead time
- Cost
- Warranty end date

The owner will know if repairs will be covered by the manufacturer (6D).

Example: Office chair

- CAD model
- Manufacturer
- Model
- Color
- Realistic model
- Material definition
- Lead time
- Cost
- Warranty end date
- Recyclability

The owner will know how to dispose of the item at the end of its life (7D).

Example: Office chair

- CAD model 
- Manufacturer — Herman Miller
- Model — Aeron
- Color — Graphite
- Realistic model 
- Material definition
- Lead time — 2 business days
- Cost — $689
- Warranty length — 12 years
- Recyclability — Recyclable materials

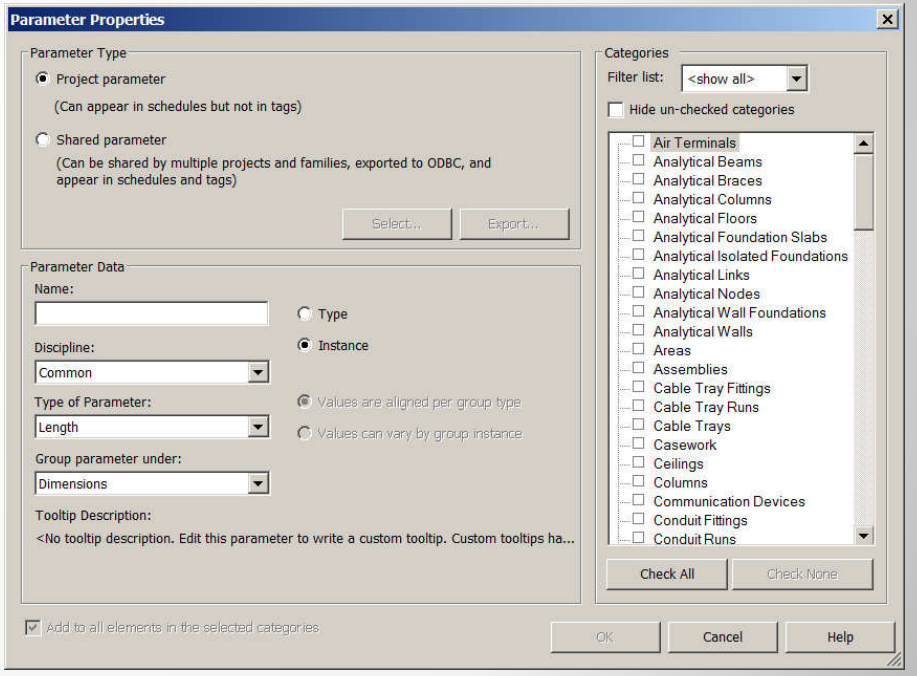
putting data in Revit

How Revit handles data

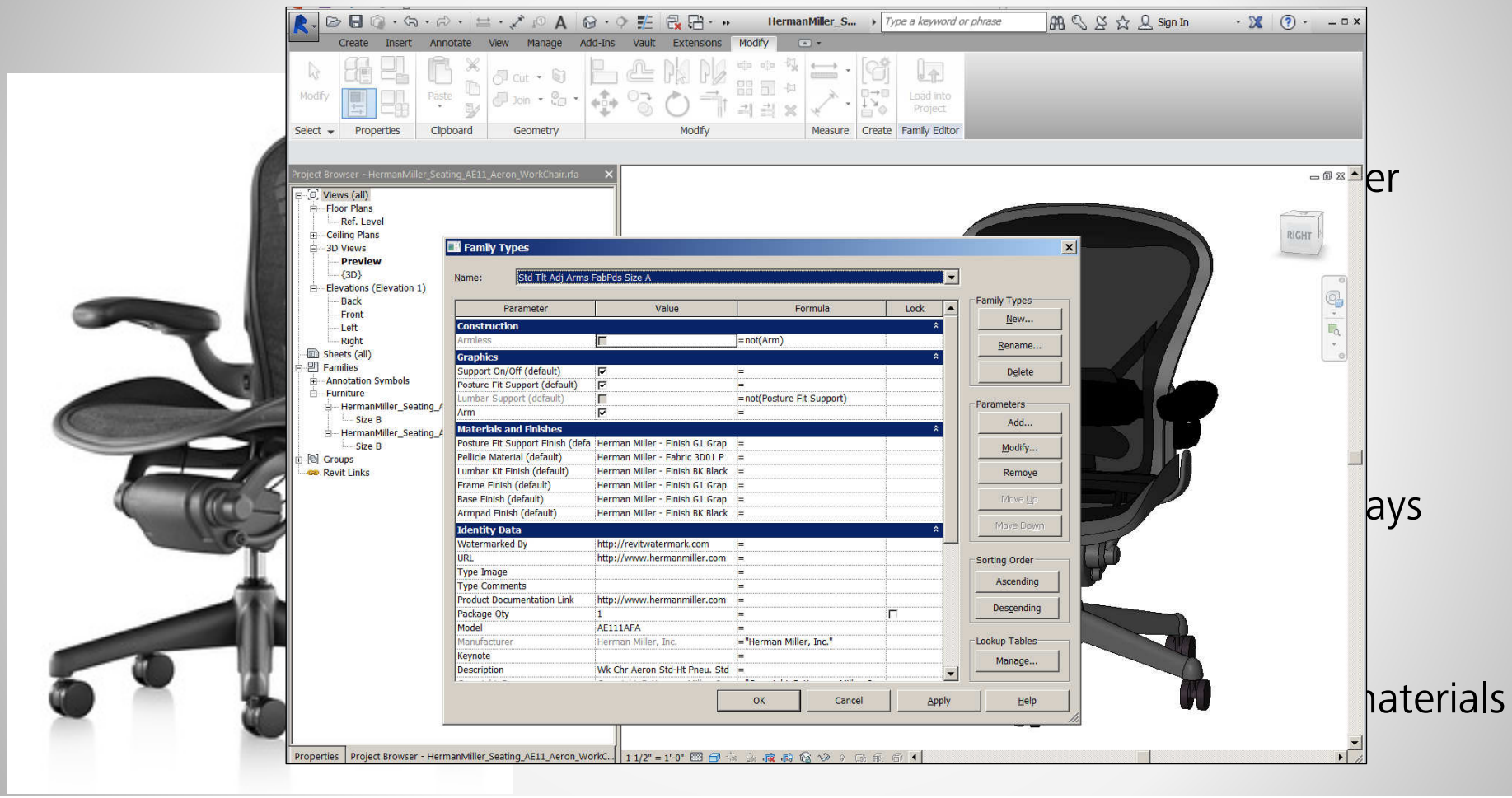
Revit allows parameters to be associated with objects such as family types, rooms, and sheets in the model.

Type parameters are entered when the object is defined (i.e., when a family is created).

Instance parameters are entered after the object is used by being placed in a model.



Example: Office chair



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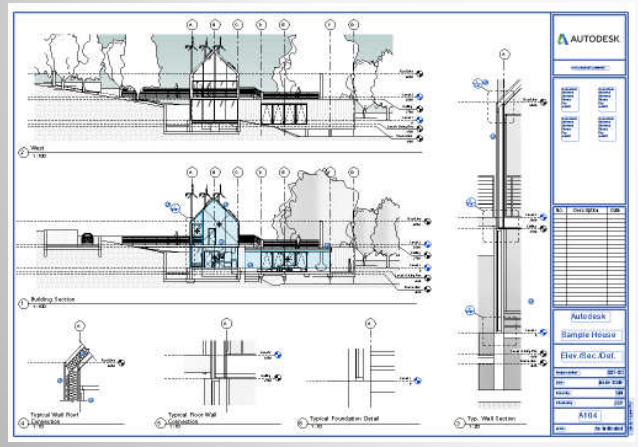
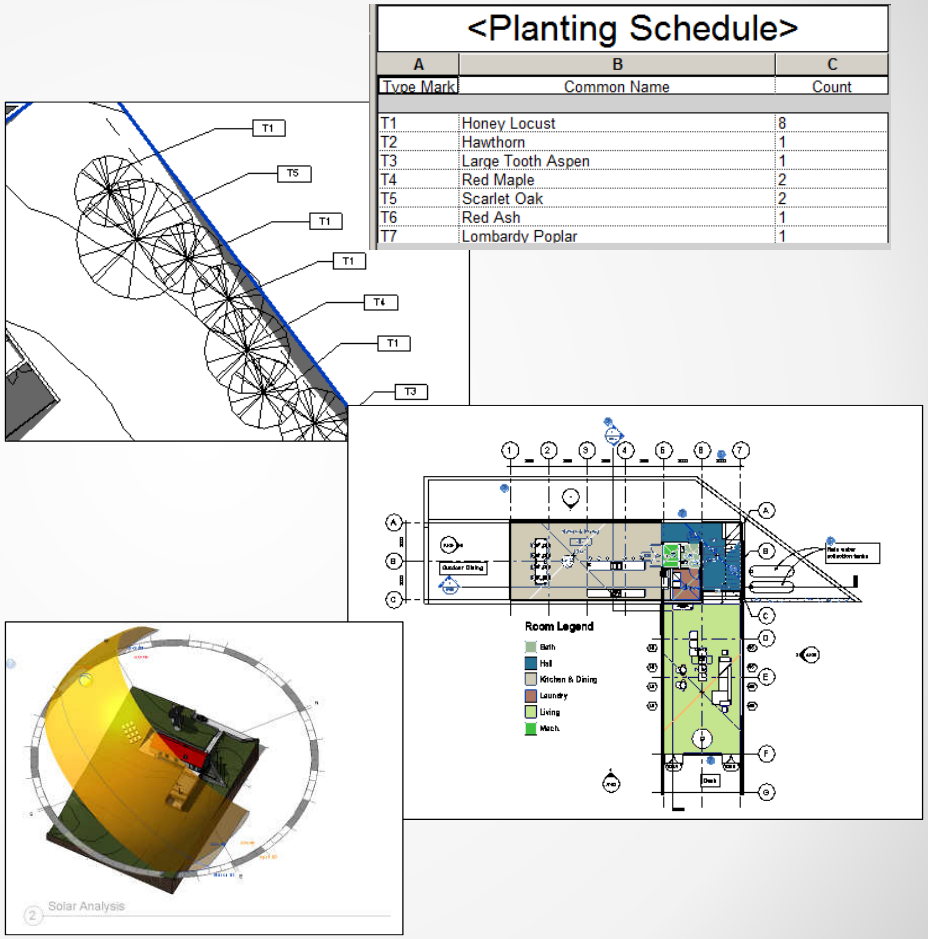
aterials

why you should put data in Revit

Data in Revit lets us

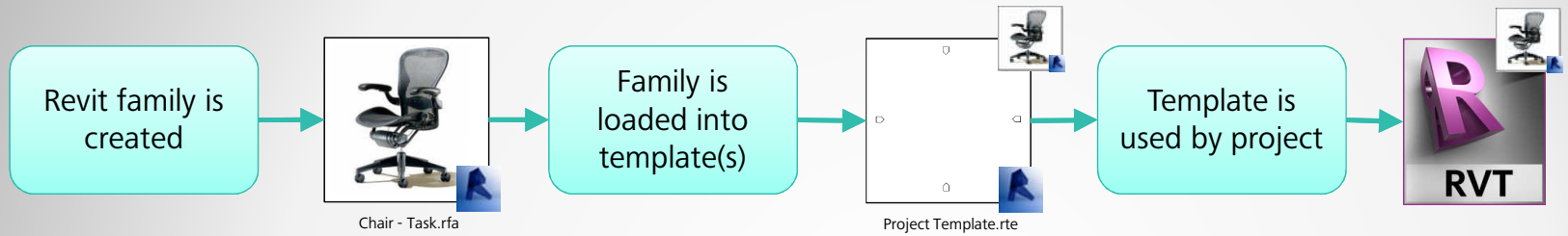
- Capture the design
- Validate it
- Analyze it
- Document it





why you shouldn’t put data in Revit

Every time you touch it, you create a new copy



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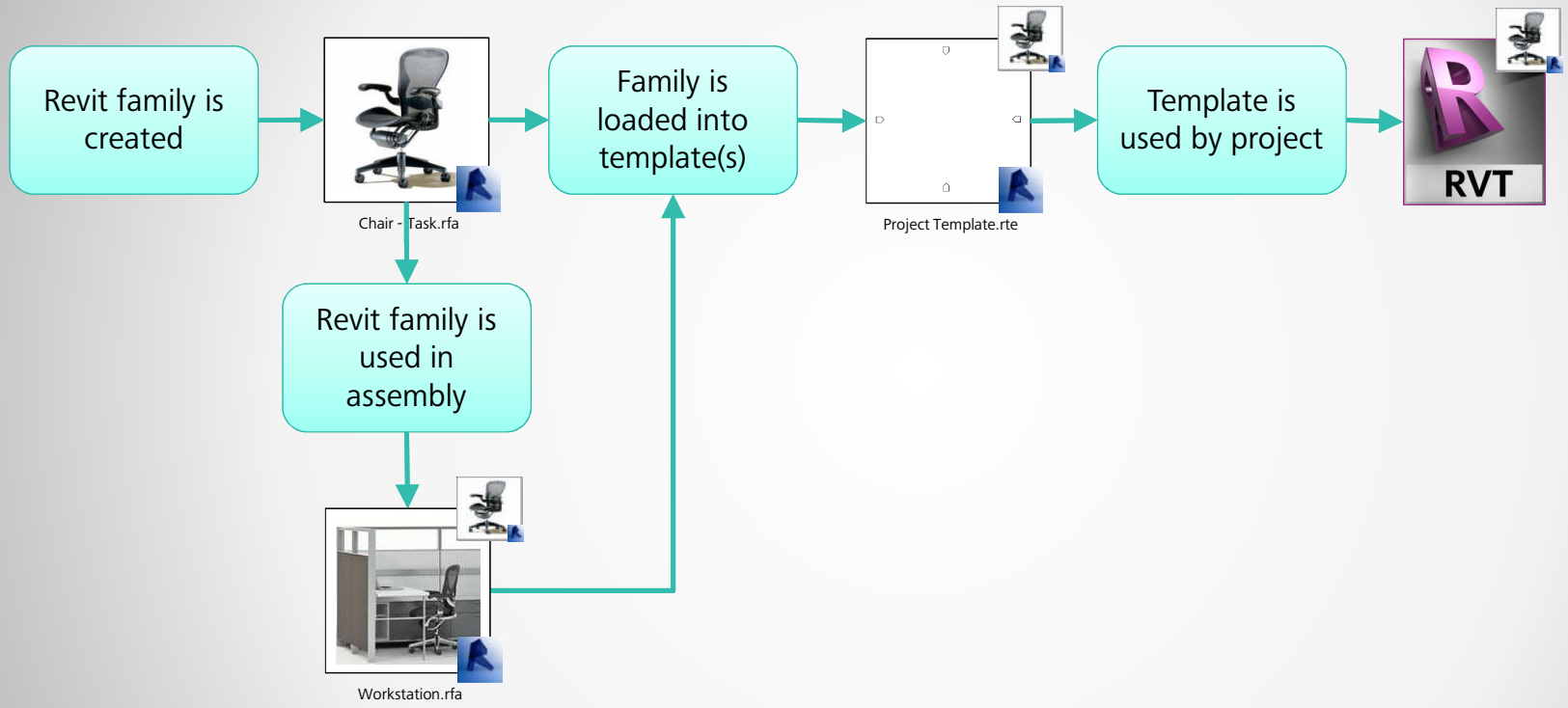

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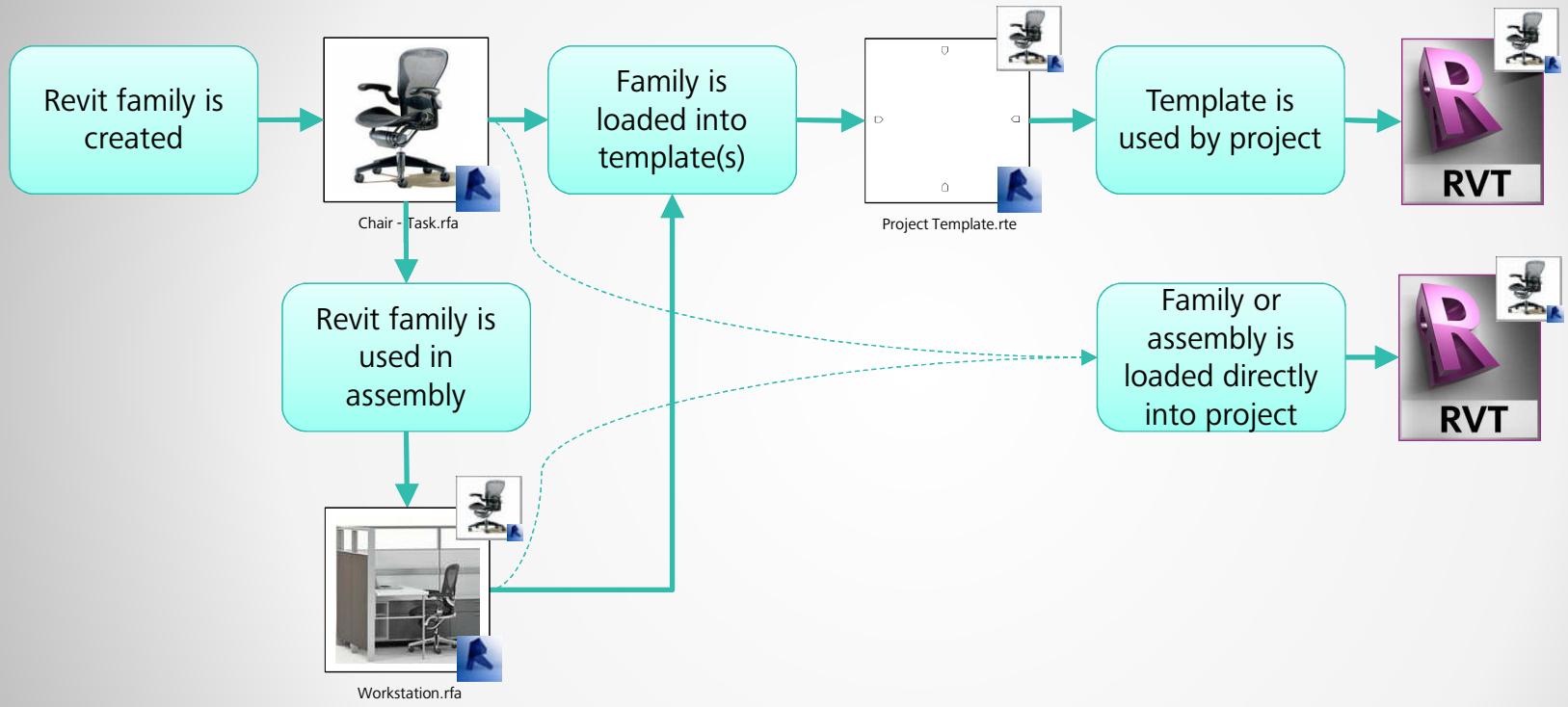
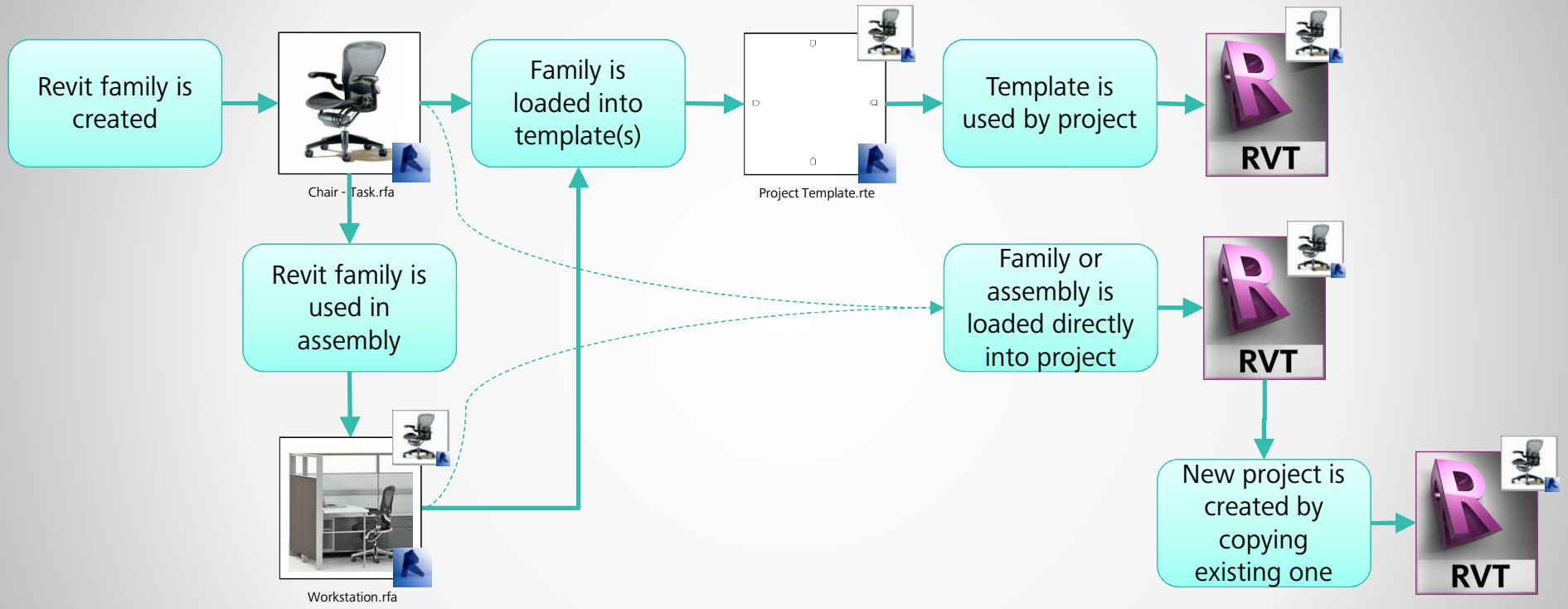
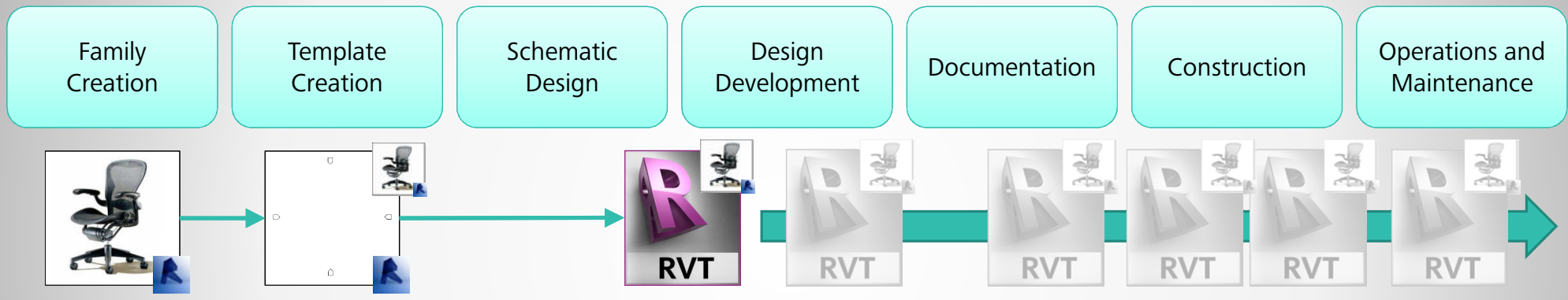


Every time you touch it, you create a new copy



As you work with it, you create even more copies

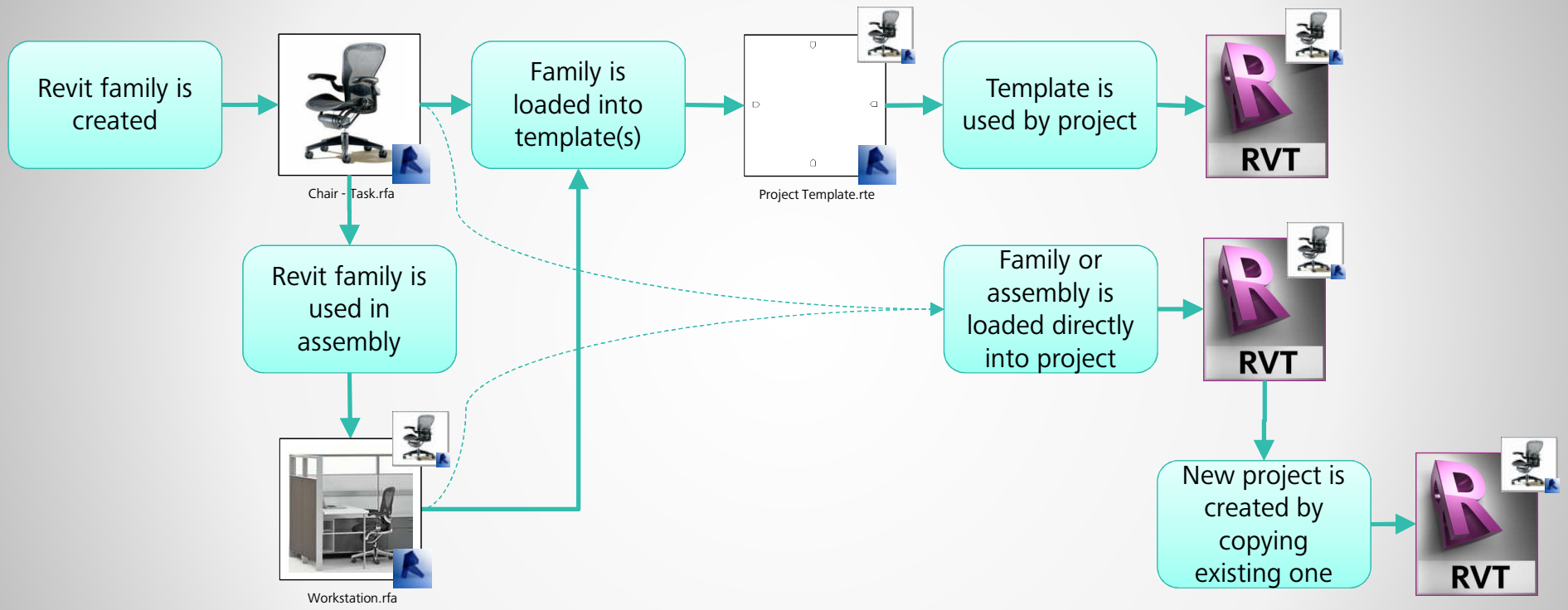


copies are good, aren't they?

Let's follow the money

- CAD model 
- Manufacturer — Herman Miller
- Model — Aeron
- Color — Graphite
- Realistic model 
- Material definition
- Lead time — 2 business days
- Cost — $689
- Warranty length — 12 years
- Recyclability — Recyclable materials

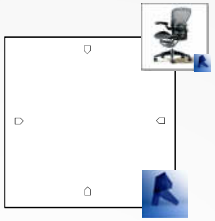
Let's follow the money



Let's follow the money

$689

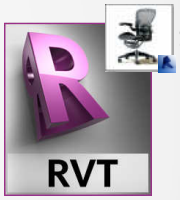
Chair - Task.rfa



$689

Project Template.rte

$689



$689

$689

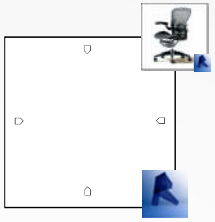
Workstation.rfa

$689

What happens when the cost changes?

$689

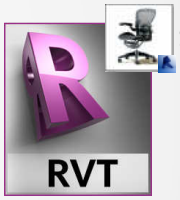
Chair - Task.rfa



$689

Project Template.rte

$689



$689

~~$689.00~~

$585.65

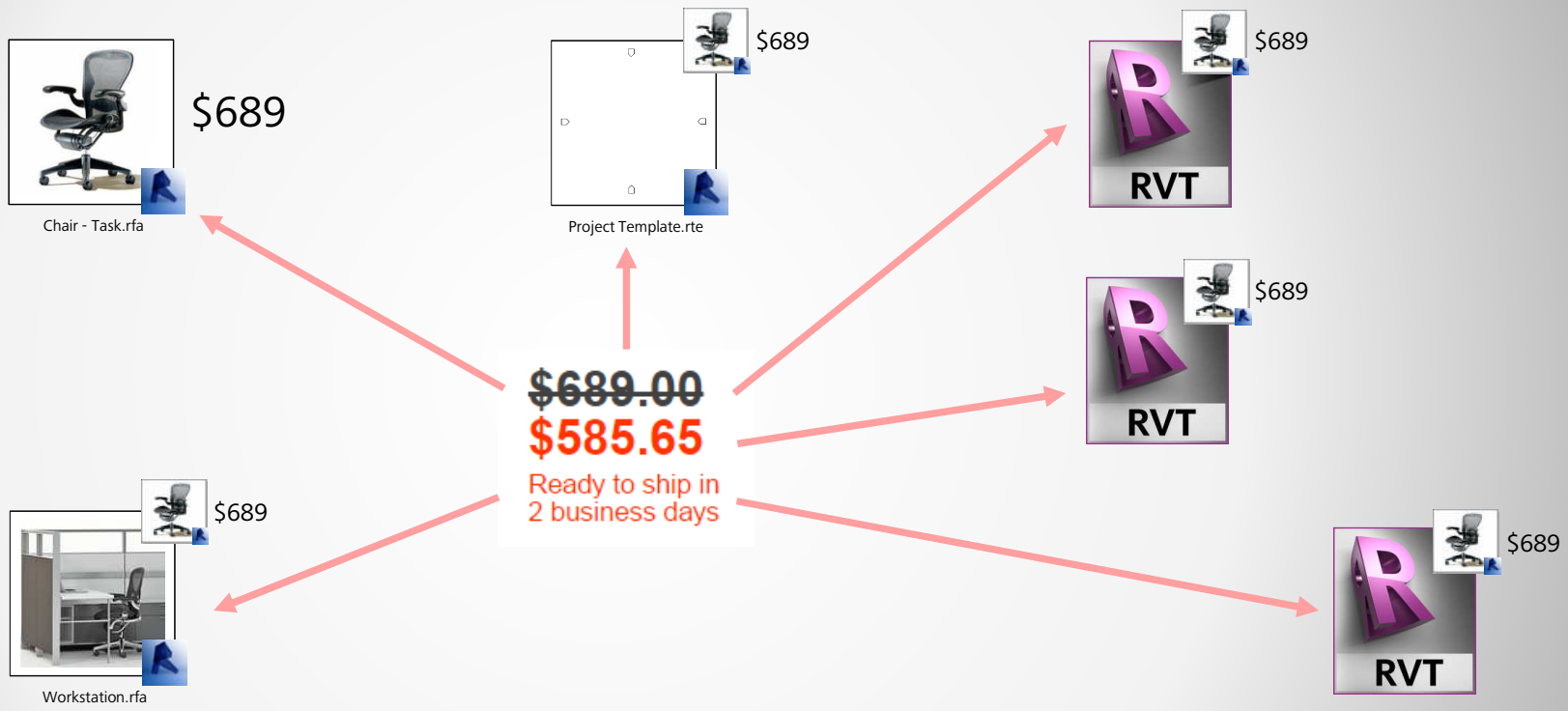
Ready to ship in
2 business days

$689

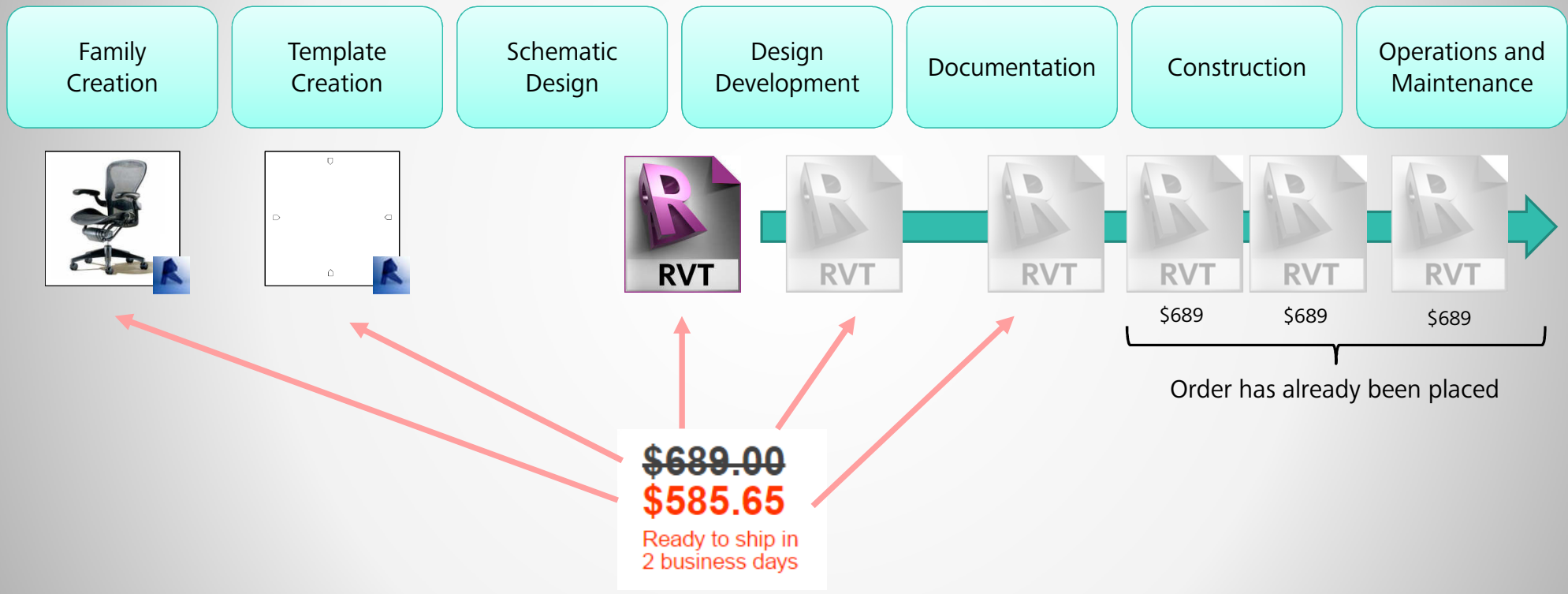
Workstation.rfa

$689

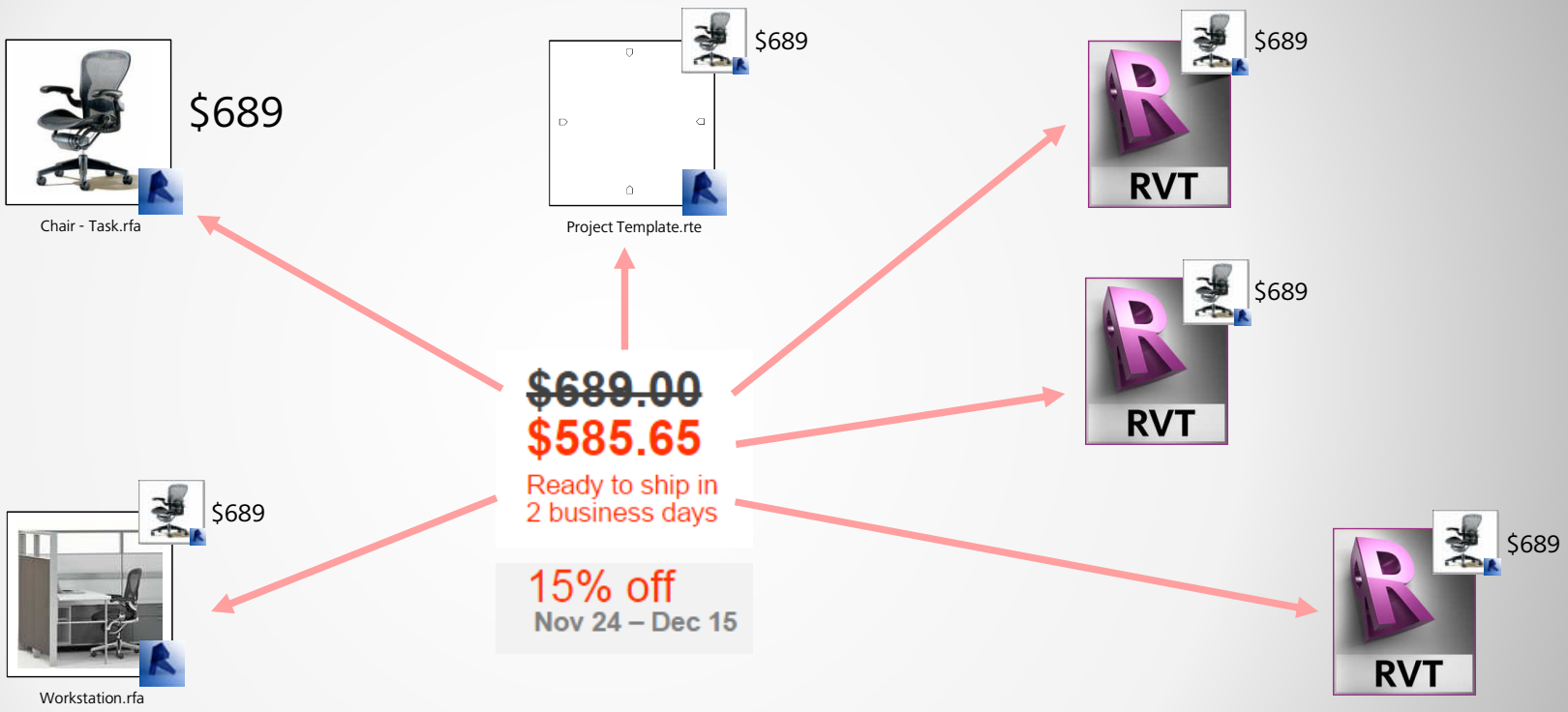
We could update the copies (if we can find them)



And if it's not too late



And if it's not going to change again soon

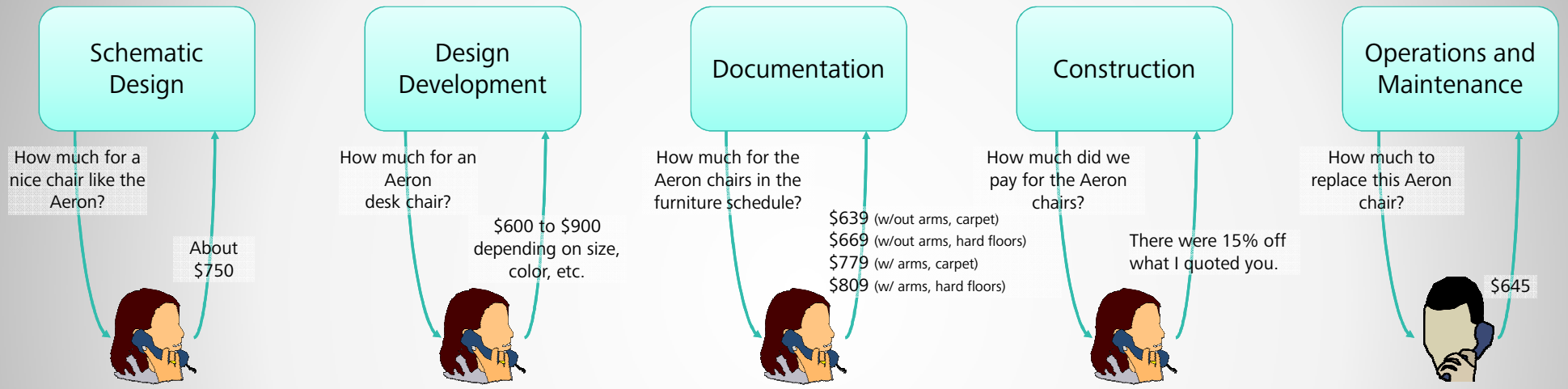


we'll call it a "planning" cost and let it be

Good decisions rely on accurate and current data

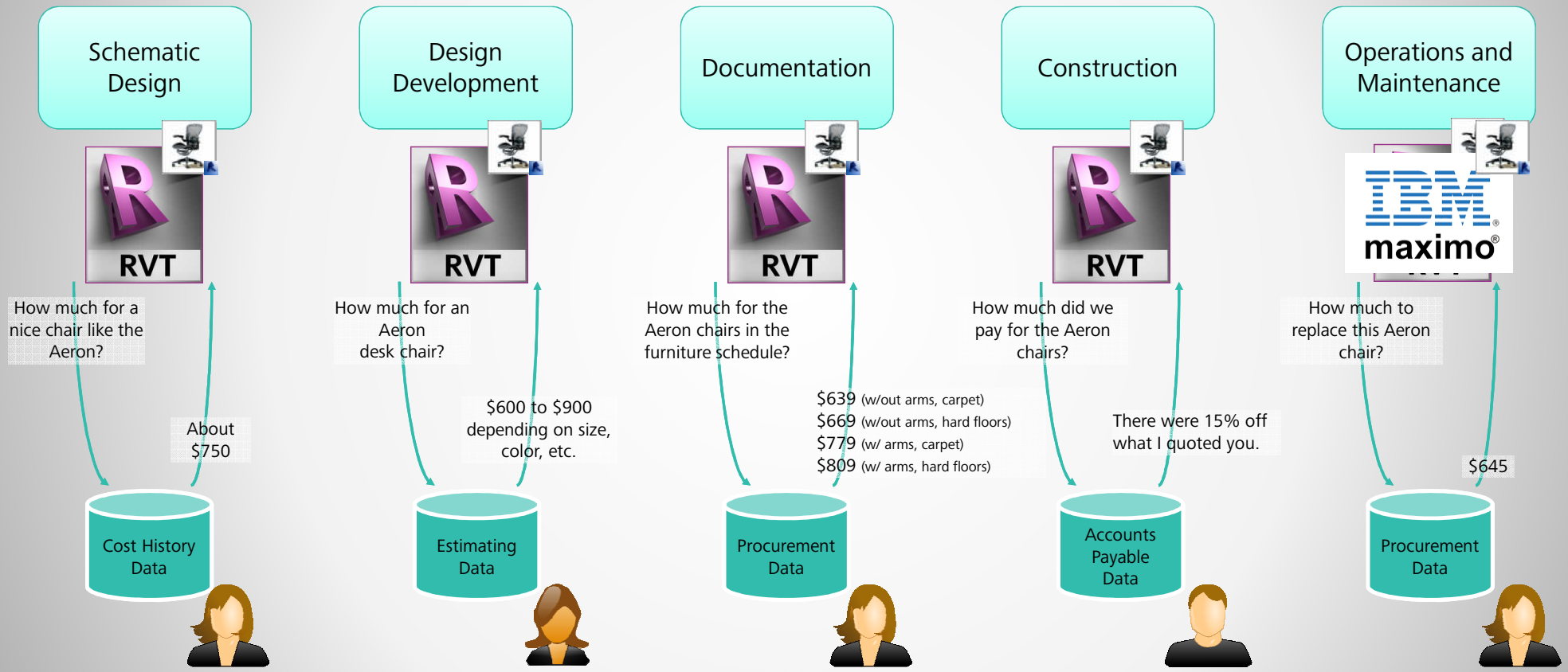
Project Phase	Meaning of Cost	Example of Cost
Schematic	Budget cost	About $750
Design	Likely cost range	$600 to $900, depending on options
Documentation	Expected cost	Will be $689
Construction	Purchase cost	Was $586
Operations	Replacement cost	Is $645

Before BIM – We asked

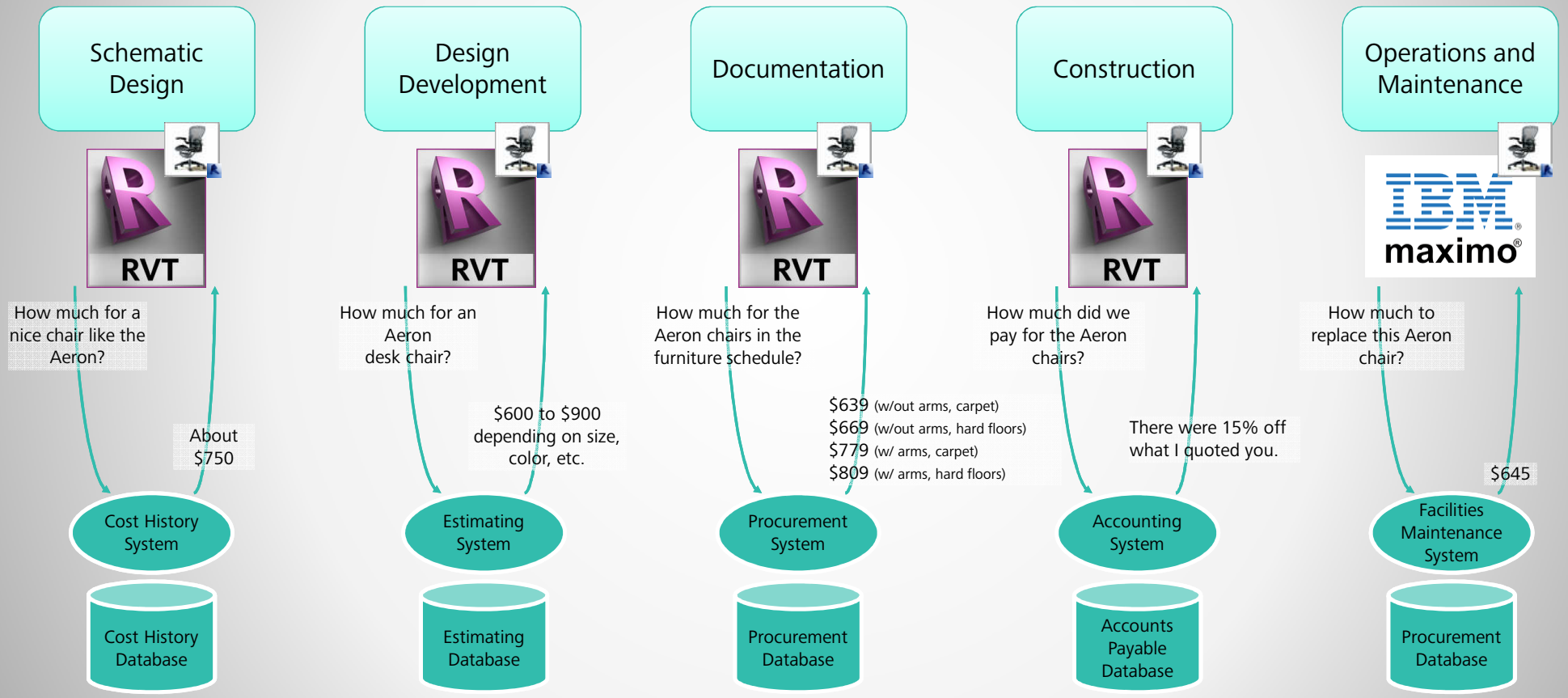


let Revit do the asking

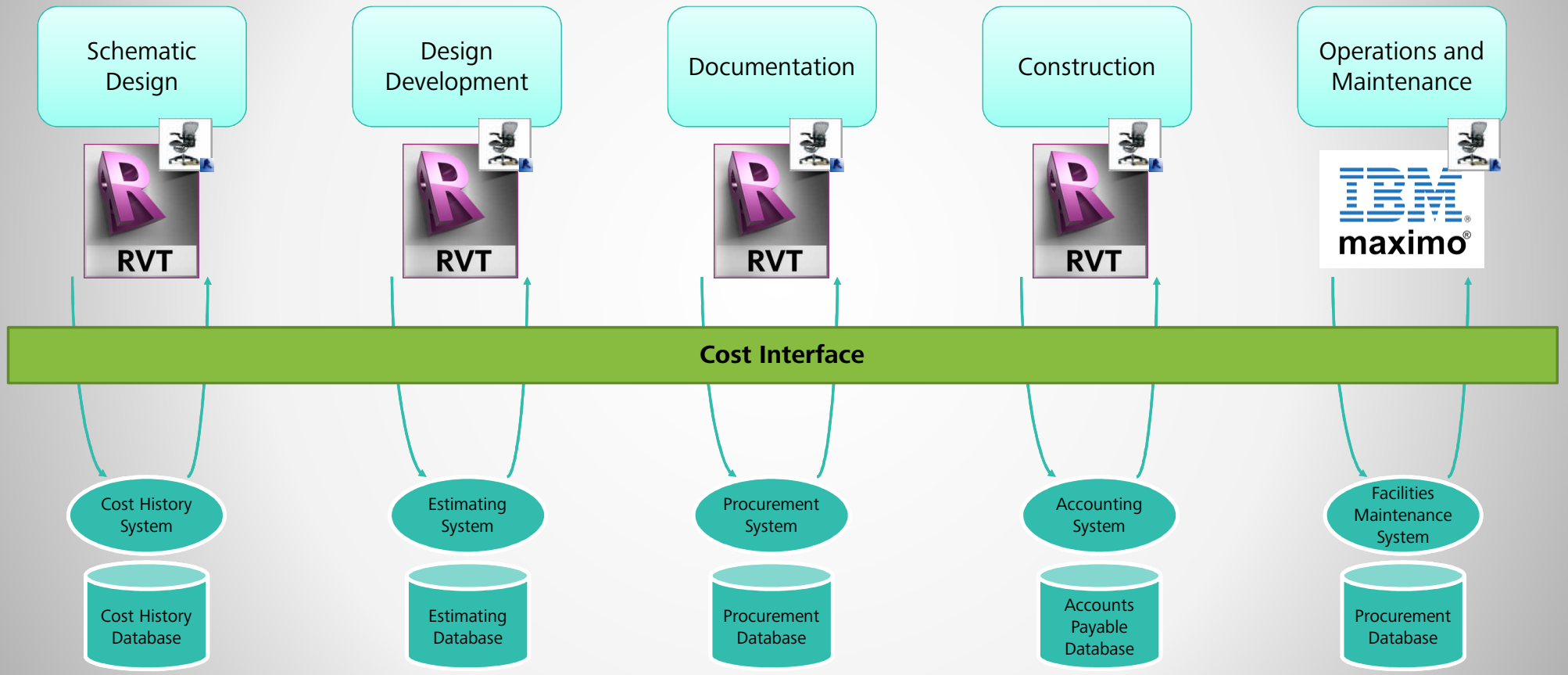
Let someone else maintain the data



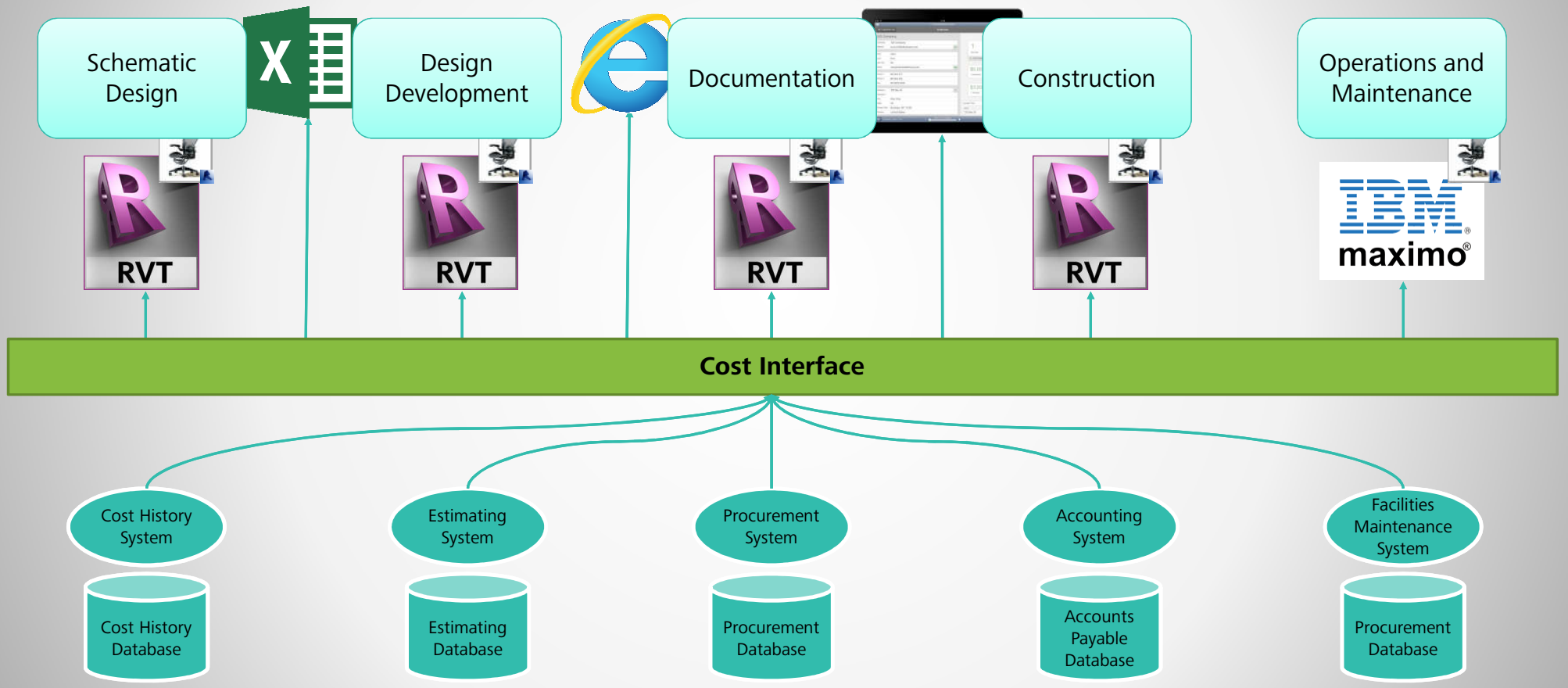
Have Revit talk to the system that controls the data



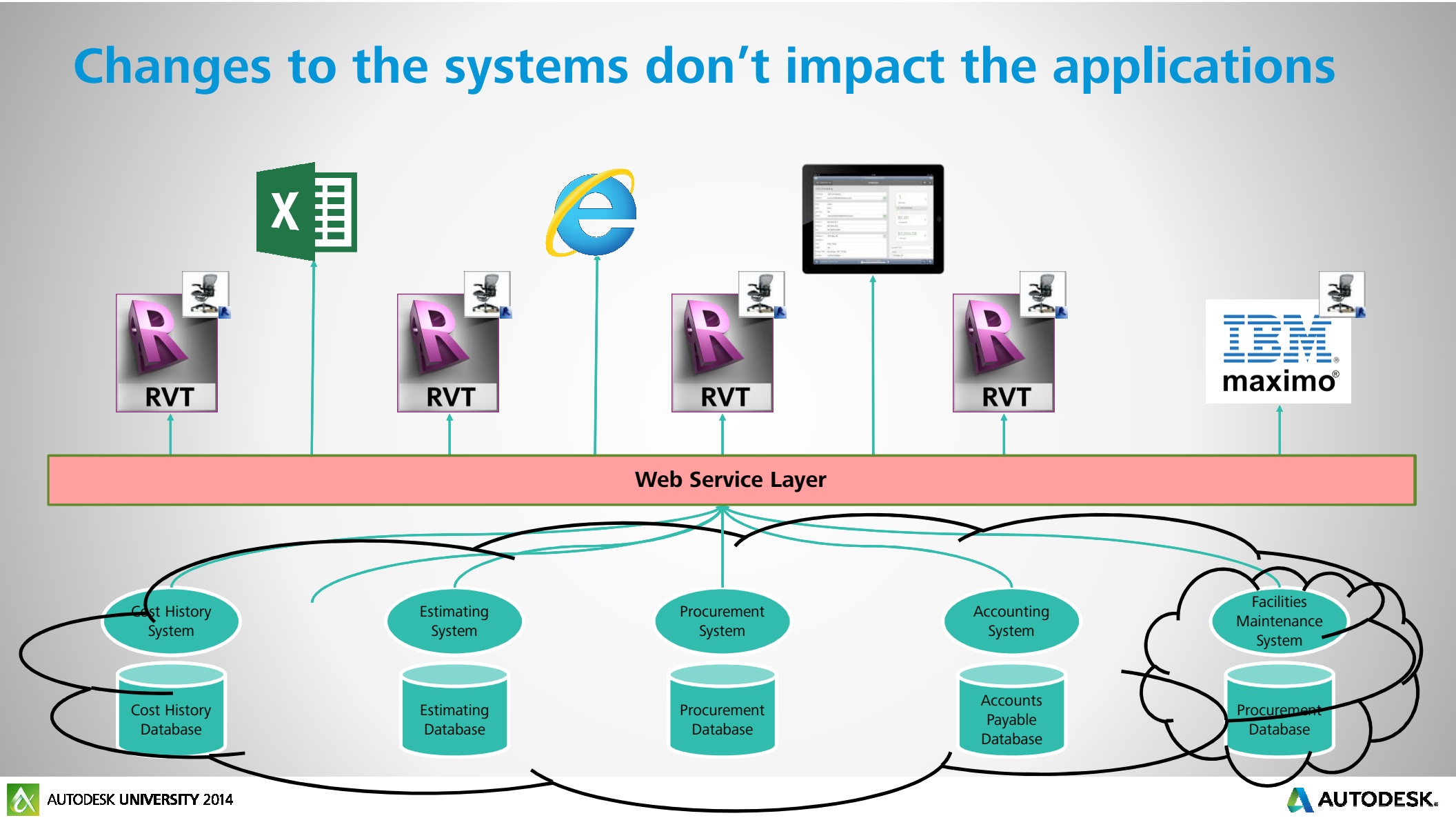
Define a single interface to the data



Other applications can use the same access to the data



Changes to the systems don't impact the applications



the lesson

Don’t put data in Revit *unless* you need it there.

Don’t put data in Revit *before* you need it there.

Leave data in the system responsible for its *maintenance*.

Get data *when* you need it and as *often* as you need it.

If you can, use *web services* to access external data.

Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2015 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time

Q&A

Extras

sometimes you need to be vague

Example: Office chair

- CAD model 
- Manufacturer — Herman Miller
- Model — Aeron
- Color — Graphite
- Realistic model 
- Material definition
- Lead time — 2 business days
- Cost — $689
- Warranty length — 12 years
- Recyclability — Recyclable materials

Selecting a Herman Miller Aeron® office chair

The Aeron chair is available in a number of options:

- **Size**: Small, Medium, Large
- **Finish**: Graphite, Titanium, Aluminum
- **Fabric**: Carbon Classic, Lead Classic, Grey Black, Blue Black, Carbon Weaves, Platinum Weaves
- **Tilt**: Standard, Tilt Limiter
- **Arms**: Adjustable, Stationary, None
- **Arm pads**: Standard, Leather
- **Back support**: Lumbar, PostureFit, None
- **Casters**: Carpet, Hard Floor/Carpet

That's 126 distinct models.

Defining an Aeron® chair in Revit

Brute force:

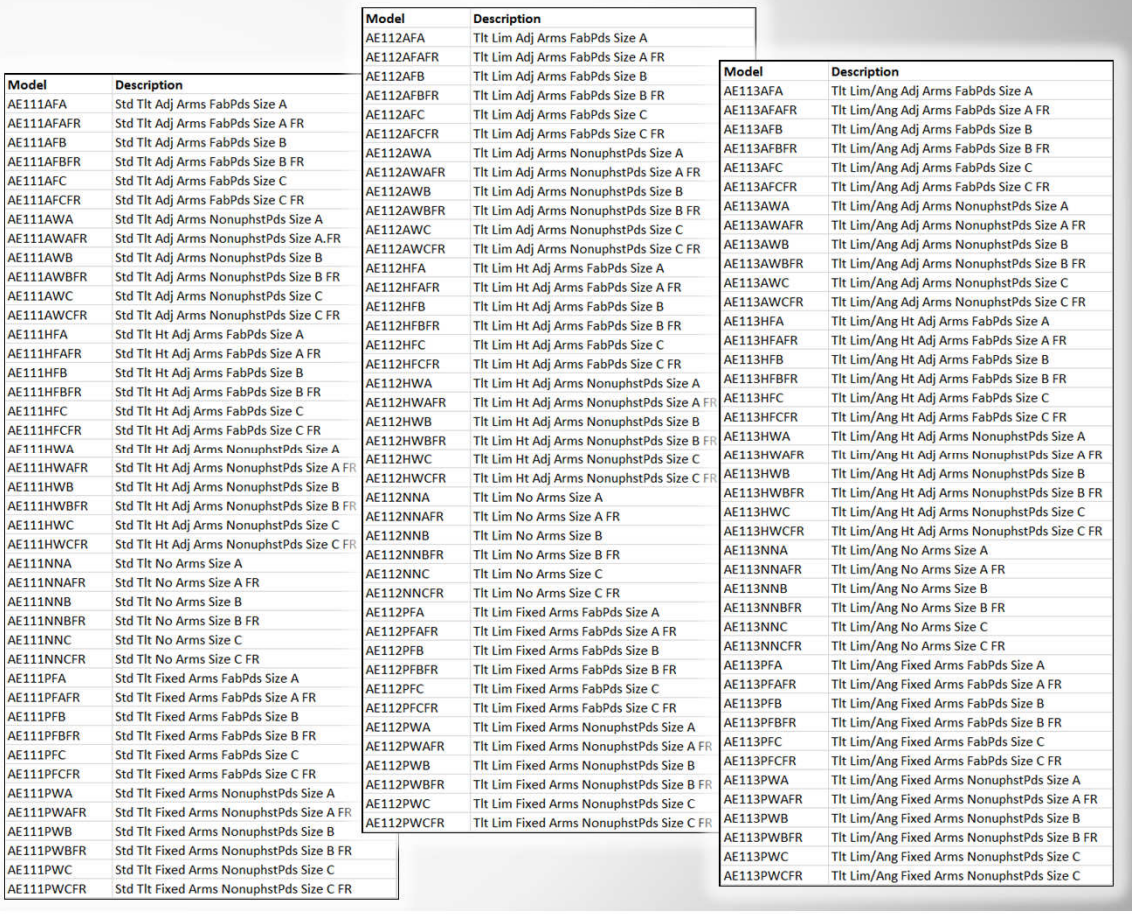
- Create 126 family types.

Better:

- Use type catalog (this is what Herman Miller did).

Alternative:

- Use instance parameters for the options (only if there are no invalid combinations)



Model	Description
AE111AFA	Std Tlt Adj Arms FabPds Size A
AE111AFAFR	Std Tlt Adj Arms FabPds Size A FR
AE111AFB	Std Tlt Adj Arms FabPds Size B
AE111AFBFR	Std Tlt Adj Arms FabPds Size B FR
AE111AFC	Std Tlt Adj Arms FabPds Size C
AE111AFCFR	Std Tlt Adj Arms FabPds Size C FR
AE111AWA	Std Tlt Adj Arms NonuphstPds Size A
AE111AWAFR	Std Tlt Adj Arms NonuphstPds Size A.FR
AE111AWB	Std Tlt Adj Arms NonuphstPds Size B
AE111AWBFR	Std Tlt Adj Arms NonuphstPds Size B FR
AE111AWC	Std Tlt Adj Arms NonuphstPds Size C
AE111AWCFR	Std Tlt Adj Arms NonuphstPds Size C FR
AE111HFA	Std Tlt Ht Adj Arms FabPds Size A
AE111HFAFR	Std Tlt Ht Adj Arms FabPds Size A FR
AE111HFB	Std Tlt Ht Adj Arms FabPds Size B
AE111HFBFR	Std Tlt Ht Adj Arms FabPds Size B FR
AE111HFC	Std Tlt Ht Adj Arms FabPds Size C
AE111HFCFR	Std Tlt Ht Adj Arms FabPds Size C FR
AE111HWA	Std Tlt Ht Adj Arms NonuphstPds Size A
AE111HWAFR	Std Tlt Ht Adj Arms NonuphstPds Size A FR
AE111HWB	Std Tlt Ht Adj Arms NonuphstPds Size B
AE111HWBFR	Std Tlt Ht Adj Arms NonuphstPds Size B FR
AE111HWC	Std Tlt Ht Adj Arms NonuphstPds Size C
AE111HWCFR	Std Tlt Ht Adj Arms NonuphstPds Size C FR
AE111NNA	Std Tlt No Arms Size A
AE111NNAFR	Std Tlt No Arms Size A FR
AE111NNB	Std Tlt No Arms Size B
AE111NNBFR	Std Tlt No Arms Size B FR
AE111NNC	Std Tlt No Arms Size C
AE111NNCFR	Std Tlt No Arms Size C FR
AE111PFA	Std Tlt Fixed Arms FabPds Size A
AE111PFAFR	Std Tlt Fixed Arms FabPds Size A FR
AE111PFB	Std Tlt Fixed Arms FabPds Size B
AE111PFBFR	Std Tlt Fixed Arms FabPds Size B FR
AE111PFC	Std Tlt Fixed Arms FabPds Size C
AE111PFCFR	Std Tlt Fixed Arms FabPds Size C FR
AE111PWA	Std Tlt Fixed Arms NonuphstPds Size A
AE111PWAFR	Std Tlt Fixed Arms NonuphstPds Size A FR
AE111PWB	Std Tlt Fixed Arms NonuphstPds Size B
AE111PWBFR	Std Tlt Fixed Arms NonuphstPds Size B FR
AE111PWC	Std Tlt Fixed Arms NonuphstPds Size C
AE111PWCFR	Std Tlt Fixed Arms NonuphstPds Size C FR

Model	Description
AE112AFA	Tlt Lim Adj Arms FabPds Size A
AE112AFAFR	Tlt Lim Adj Arms FabPds Size A FR
AE112AFB	Tlt Lim Adj Arms FabPds Size B
AE112AFBFR	Tlt Lim Adj Arms FabPds Size B FR
AE112AFC	Tlt Lim Adj Arms FabPds Size C
AE112AFCFR	Tlt Lim Adj Arms FabPds Size C FR
AE112AWA	Tlt Lim Adj Arms NonuphstPds Size A
AE112AWAFR	Tlt Lim Adj Arms NonuphstPds Size A FR
AE112AWB	Tlt Lim Adj Arms NonuphstPds Size B
AE112AWBFR	Tlt Lim Adj Arms NonuphstPds Size B FR
AE112AWC	Tlt Lim Adj Arms NonuphstPds Size C
AE112AWCFR	Tlt Lim Adj Arms NonuphstPds Size C FR
AE112HFA	Tlt Lim Ht Adj Arms FabPds Size A
AE112HFAFR	Tlt Lim Ht Adj Arms FabPds Size A FR
AE112HFB	Tlt Lim Ht Adj Arms FabPds Size B
AE112HFBFR	Tlt Lim Ht Adj Arms FabPds Size B FR
AE112HFC	Tlt Lim Ht Adj Arms FabPds Size C
AE112HFCFR	Tlt Lim Ht Adj Arms FabPds Size C FR
AE112HWA	Tlt Lim Ht Adj Arms NonuphstPds Size A
AE112HWAFR	Tlt Lim Ht Adj Arms NonuphstPds Size A FR
AE112HWB	Tlt Lim Ht Adj Arms NonuphstPds Size B
AE112HWBFR	Tlt Lim Ht Adj Arms NonuphstPds Size B FR
AE112HWC	Tlt Lim Ht Adj Arms NonuphstPds Size C
AE112HWCFR	Tlt Lim Ht Adj Arms NonuphstPds Size C FR
AE112NNA	Tlt Lim No Arms Size A
AE112NNAFR	Tlt Lim No Arms Size A FR
AE112NNB	Tlt Lim No Arms Size B
AE112NNBFR	Tlt Lim No Arms Size B FR
AE112NNC	Tlt Lim No Arms Size C
AE112NNCFR	Tlt Lim No Arms Size C FR
AE112PFA	Tlt Lim Fixed Arms FabPds Size A
AE112PFAFR	Tlt Lim Fixed Arms FabPds Size A FR
AE112PFB	Tlt Lim Fixed Arms FabPds Size B
AE112PFBFR	Tlt Lim Fixed Arms FabPds Size B FR
AE112PFC	Tlt Lim Fixed Arms FabPds Size C
AE112PFCFR	Tlt Lim Fixed Arms FabPds Size C FR
AE112PWA	Tlt Lim Fixed Arms NonuphstPds Size A
AE112PWAFR	Tlt Lim Fixed Arms NonuphstPds Size A FR
AE112PWB	Tlt Lim Fixed Arms NonuphstPds Size B
AE112PWBFR	Tlt Lim Fixed Arms NonuphstPds Size B FR
AE112PWC	Tlt Lim Fixed Arms NonuphstPds Size C
AE112PWCFR	Tlt Lim Fixed Arms NonuphstPds Size C FR

Model	Description
AE113AFA	Tlt Lim/Ang Adj Arms FabPds Size A
AE113AFAFR	Tlt Lim/Ang Adj Arms FabPds Size A FR
AE113AFB	Tlt Lim/Ang Adj Arms FabPds Size B
AE113AFBFR	Tlt Lim/Ang Adj Arms FabPds Size B FR
AE113AFC	Tlt Lim/Ang Adj Arms FabPds Size C
AE113AFCFR	Tlt Lim/Ang Adj Arms FabPds Size C FR
AE113AWA	Tlt Lim/Ang Adj Arms NonuphstPds Size A
AE113AWAFR	Tlt Lim/Ang Adj Arms NonuphstPds Size A FR
AE113AWB	Tlt Lim/Ang Adj Arms NonuphstPds Size B
AE113AWBFR	Tlt Lim/Ang Adj Arms NonuphstPds Size B FR
AE113AWC	Tlt Lim/Ang Adj Arms NonuphstPds Size C
AE113AWCFR	Tlt Lim/Ang Adj Arms NonuphstPds Size C FR
AE113HFA	Tlt Lim/Ang Ht Adj Arms FabPds Size A
AE113HFAFR	Tlt Lim/Ang Ht Adj Arms FabPds Size A FR
AE113HFB	Tlt Lim/Ang Ht Adj Arms FabPds Size B
AE113HFBFR	Tlt Lim/Ang Ht Adj Arms FabPds Size B FR
AE113HFC	Tlt Lim/Ang Ht Adj Arms FabPds Size C
AE113HFCFR	Tlt Lim/Ang Ht Adj Arms FabPds Size C FR
AE113HWA	Tlt Lim/Ang Ht Adj Arms NonuphstPds Size A
AE113HWAFR	Tlt Lim/Ang Ht Adj Arms NonuphstPds Size A FR
AE113HWB	Tlt Lim/Ang Ht Adj Arms NonuphstPds Size B
AE113HWBFR	Tlt Lim/Ang Ht Adj Arms NonuphstPds Size B FR
AE113HWC	Tlt Lim/Ang Ht Adj Arms NonuphstPds Size C
AE113HWCFR	Tlt Lim/Ang Ht Adj Arms NonuphstPds Size C FR
AE113NNA	Tlt Lim/Ang No Arms Size A
AE113NNAFR	Tlt Lim/Ang No Arms Size A FR
AE113NNB	Tlt Lim/Ang No Arms Size B
AE113NNBFR	Tlt Lim/Ang No Arms Size B FR
AE113NNC	Tlt Lim/Ang No Arms Size C
AE113NNCFR	Tlt Lim/Ang No Arms Size C FR
AE113PFA	Tlt Lim/Ang Fixed Arms FabPds Size A
AE113PFAFR	Tlt Lim/Ang Fixed Arms FabPds Size A FR
AE113PFB	Tlt Lim/Ang Fixed Arms FabPds Size B
AE113PFBFR	Tlt Lim/Ang Fixed Arms FabPds Size B FR
AE113PFC	Tlt Lim/Ang Fixed Arms FabPds Size C
AE113PFCFR	Tlt Lim/Ang Fixed Arms FabPds Size C FR
AE113PWA	Tlt Lim/Ang Fixed Arms NonuphstPds Size A
AE113PWAFR	Tlt Lim/Ang Fixed Arms NonuphstPds Size A FR
AE113PWB	Tlt Lim/Ang Fixed Arms NonuphstPds Size B
AE113PWBFR	Tlt Lim/Ang Fixed Arms NonuphstPds Size B FR
AE113PWC	Tlt Lim/Ang Fixed Arms NonuphstPds Size C
AE113PWCFR	Tlt Lim/Ang Fixed Arms NonuphstPds Size C

Specificity is counter-productive

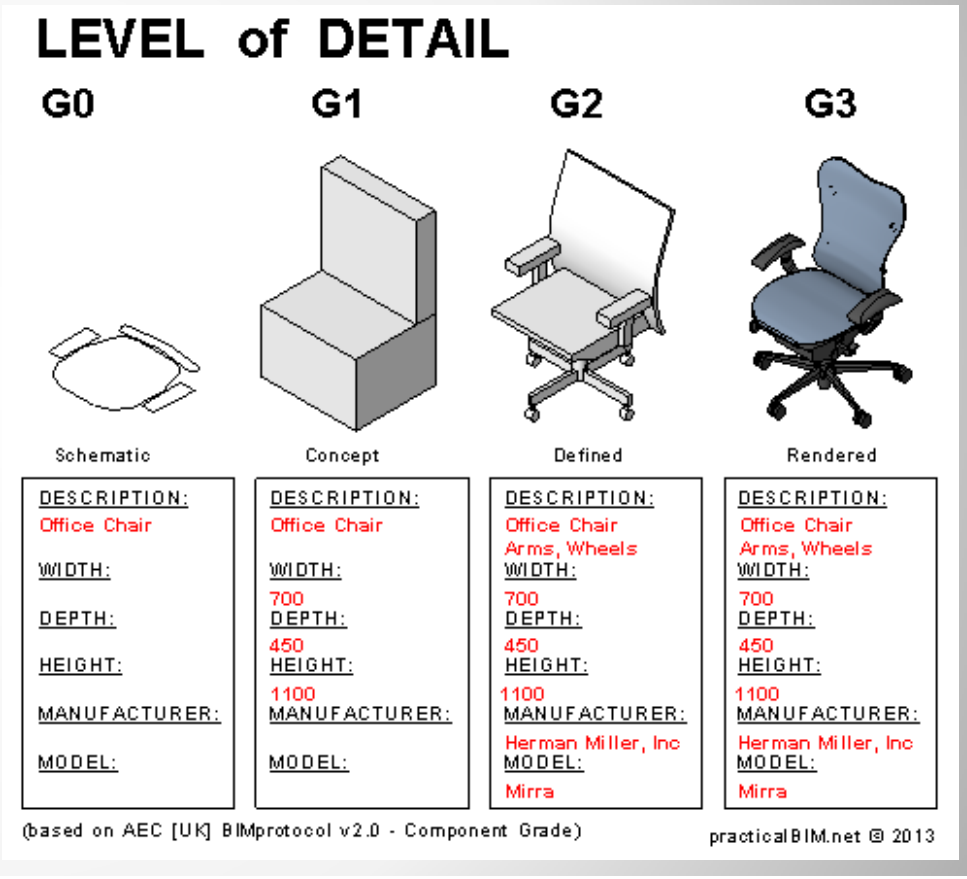
- Using one of the family types before a decision has been made on the chair options communicates erroneous information.
- What is needed is a “generic” chair.
- That generic chair should collect additional information, as decisions are made, until it matches a specific model of chair.
- At that point, the generic chair should morph into the “correct” chair.

- There are several efforts that are working to define best practices.

Level of detail / grade of definition

Based on the notion that the level of knowledge increases as the project gets better defined.

For a discussion visit:
http://practicalbim.blogspot.com/2013/03/what-is-this-thing-called-lod.html

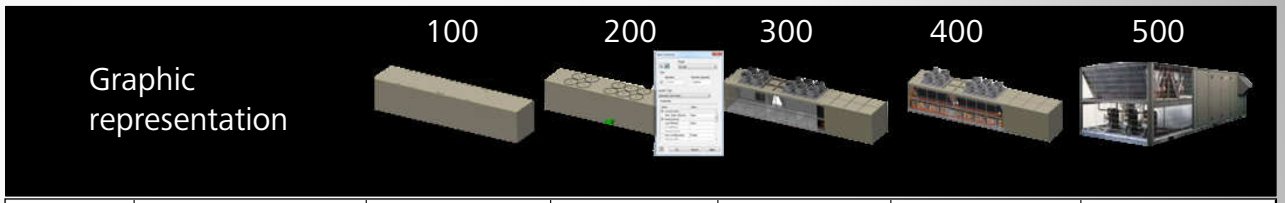


Side note: Level of development (LOD)

Identifies information that can be *trusted* at each point in the project.

Graphic representation often assumed to increase in detail.

Formalized by AIA. Still a work-in-progress.



	Parameter	Schematic Design	Design Development	Construction Documents	Bidding/ Tendering	Construction Administration
General Information						
	Manufacturer name	Potential manufacturers	Specified manufacturers	BOD manufacturer	Proposed manufacturer	Selected manufacturer
	Model number		Potential model number	Specified model number	Proposed model number	Selected model number
	Serial Number					x
Physical Characteristics						
	Space requirements (Size)	Approximate volume	Range of dimensions	Likely dimensions	Proposed dimensions	Selected dimensions
	Structural Loads (Weight)	Approximate weight	Range of weights	Likely weight	Proposed weight	Selected weight
Financial Characteristics						
	Capital Expenditure (Cost)	Broad cost range	Specific cost range	Project cost	Proposed cost	Selected cost
	Operational Expenditure (lifecycle cost)	Broad projected lifecycle cost range	x	x	x	x
Design Characteristics						
	Nominal Gross Cooling Capacity (MBh)	x	x	x	x	x
	CFM		x	x	x	x
	Electrical Power requirements		x	x	x	x
	Voltage Selection		x	x	x	x
	w.g. Static Pressure		x	x	x	x
	Typical Points			x	x	x
Performance Characteristics						
	Full load performance curves		x	x	x	x
	Part load performance curves			x	x	x
	Sequence of Operations			x	x	x
	Control points			x	x	c

Side note: Model Development Specification

UniFormat Level							Date			Date			Date			Date			Date			Date			Date		
							Conceptual			SD						DD						CD					
1	2	3	4	5						50%			100%			50%			100%			50%			100%		
						Level	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes
A	10	30	7		Under-Slab Insulation	4	100	A		100	E		100	E		200	E		200	E		200	S		200	S	
A	10	30	7	10	Subdrainage Piping	5	100	A		100	E		100	E		200	E		201	E		200	S		200	S	
A	20				**Basement Construction**	2																					
A	20	10			**Basement Excavation**	3																					
A	20	10	1		Excavation for Basements	4							200	E		300	E		300	E		300	S		300	S	
A	20	10	1	10	Basement Excavation & Backfill	5							200	E		300	E		300	E		300	S		300	S	
A	20	10	2		Structural Backfill & Compaction	4							100	E		100	E		100	E		100	S		100	S	
A	20	10	3		Shoring	4							100	E		100	E		100	E		100	S		100	S	
A	20	10	3	10	Shoring	5							100	E		100	E		100	E		100	S		100	S	
A	20	20			**Basement Walls**	3																					
A	20	20	1		Basement Wall Construction	4	200	A		200	E		200	E		300	E		300	E		300	S		300	S	
A	20	20	1	10	Basement Walls - CIP	5	200	A		200	E		200	E		300	E		300	E		300	S		300	S	
A	20	20	1	20	Basement Walls - CMU	5	200	A		200	E		200	E		300	E		300	E		300	S		300	S	
A	20	20	1	30	Basement Walls - Wood	5	200	A		200	E		200	E		300	E		300	E		300	S		300	S	
A	20	20	2		Moisture Protection	4							100	E		100	E		100	E		100	S		100	S	
A	20	20	2	10	Foundation Dampproofing	5							100	E		100	E		100	E		100	S		100	S	
A	20	20	3		Basement Wall Insulation	4							100	E		100	E		100	E		100	S		100	S	
A	20	20	3	10	Basement Wall Insulation - Rigid	5							100	E		100	E		100	E		100	S		100	S	
A	20	20	4		Interior Skin	4							100	A		100	A		100	A		100	A		100	A	
B					**Shell**	1																					
B	10				**Superstructure**	2																					
B	10	10			**Floor Construction**	3																					
B	10	10	1		Suspended Basement Floor Construction	4	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2		Upper Floor Framing - Vertical Elements	4	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	10	Bearing Walls - CIP	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	15	Bearing Walls - Block	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	20	Bearing Walls - Drywall w/Studs	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	25	Bearing Walls - Plaster w/Studs	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	40	Columns - CIP	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	45	Columns - Precast	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	50	Columns - Steel	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	
B	10	10	2	55	Columns - Wood	5	200	A		200	A		200	A		200	E		200	E		300	S		300	S	

When specifics are not yet available

Use a generic object.

Populate the object with only known facts.

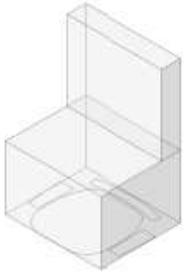
Augment the definition of the object as you learn more about the object:

- When designer/owner selects specific model
- After bids have been received
- After items have been delivered

Of course, let Revit get the data from whichever system already has that data.

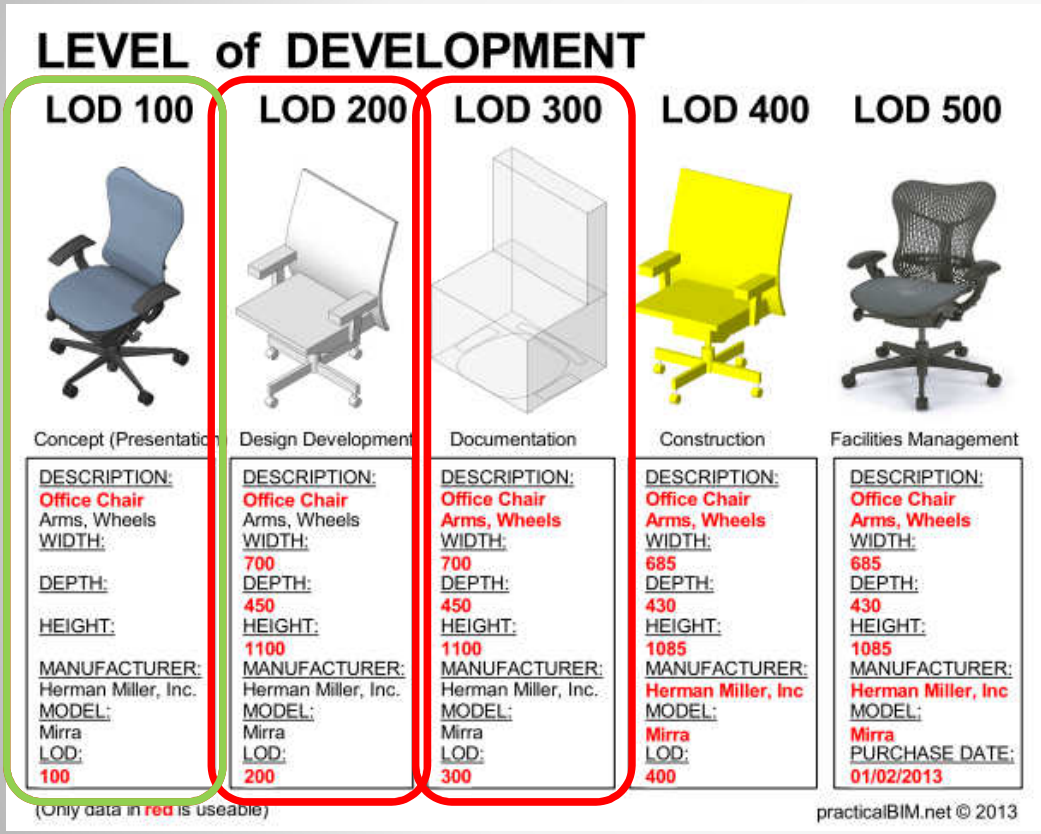
Quiz: What's a generic object

LEVEL of DEVELOPMENT

LOD 100	LOD 200	LOD 300	LOD 400	LOD 500
				
Concept (Presentation)	Design Development	Documentation	Construction	Facilities Management
DESCRIPTION: **Office Chair** Arms, Wheels WIDTH: DEPTH: HEIGHT: MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: **100**	DESCRIPTION: **Office Chair** Arms, Wheels WIDTH: **700** DEPTH: **450** HEIGHT: **1100** MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: **200**	DESCRIPTION: **Office Chair** **Arms, Wheels** WIDTH: **700** DEPTH: **450** HEIGHT: **1100** MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: **300**	DESCRIPTION: **Office Chair** **Arms, Wheels** WIDTH: **685** DEPTH: **430** HEIGHT: **1085** MANUFACTURER: **Herman Miller, Inc** MODEL: **Mirra** LOD: **400**	DESCRIPTION: **Office Chair** **Arms, Wheels** WIDTH: **685** DEPTH: **430** HEIGHT: **1085** MANUFACTURER: **Herman Miller, Inc** MODEL: **Mirra** PURCHASE DATE: **01/02/2013**

(Only data in **red** is useable)

Quiz: What's a generic object



Question: Which LOD is using the most generic object?

Answer: LOD 100

Why: A high degree of detail was needed to generate realistic renderings. But no decision has been made about the model or even the overall size of the chair.

sometimes you just don't want to know

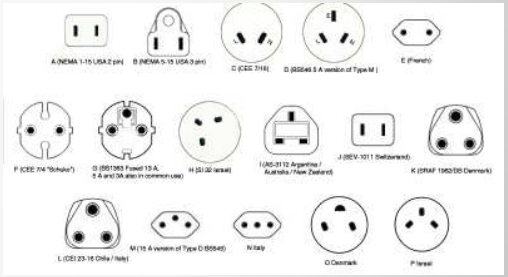
Example: Blender

The design of a store calls for the placement of a blender in the model.

The capabilities of the appliance are known.

But, the specific model depends on the type of plug needed.

The appliance will be ordered using the information in the model.



Defining the blender in Revit

- This problem is similar to the “too early specificity” problem illustrated with the office chair.
- In this case, however, the designer has no reason to learn the type of plug needed since that information does not reflect a choice.

When specifics are not needed

- As with the office chair, the blender should be represented with a generic plug.
- The type of plug and the resulting model number should be populated in Revit by looking up that information using the store location.
- That lookup information should be maintained outside Revit.