# Dang It, Jim!
# I’m a Modeler, Not a Data Scientist:
# Dashboarding Model Health

Dr. Kristopher Dane

Director of Digital Design, Thornton Tomasetti

AUTODESK. UNIVERSITY

# Learning Objectives

1) DISCOVER THE VALUE OF MONITORING MODEL HEALTH

2) DISCOVER THE PROCESS OF SETTING UP THE REVIT MODEL ANALYTICS DASHBOARD IN AN AEC FIRM

3) DISCOVER ALTERNATIVE DASHBOARDS FOR MONITORING MODEL HEALTH

4) LEARN ABOUT THE IMPLICATIONS TO DAILY MODELING PRACTICE AS A RESULT OF MONITORING MODELS

# About the speaker

Jim

## Technology Leadership

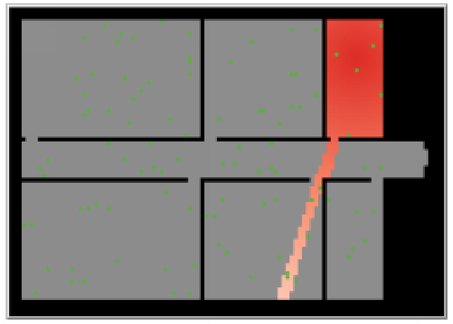
“Taking the stupid out” by improving workflows and analysis

Thornton Tomasetti

CORE studio

## Performance Based Security

Advancing the state of the art for active shooter modeling



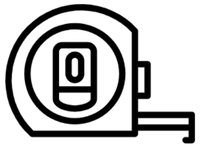
Shooter Effective Range

# New BIM Manager’s Plight

## I SEE DEAD MODELS

Only see problematic models

Only part of the story



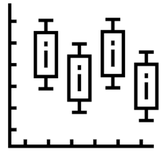
## HOW ARE WE DOING?

Lots of offices

Lots of work

Lots of teaming arrangements

Improving work



## GOING BEYOND STORIES

More than perception

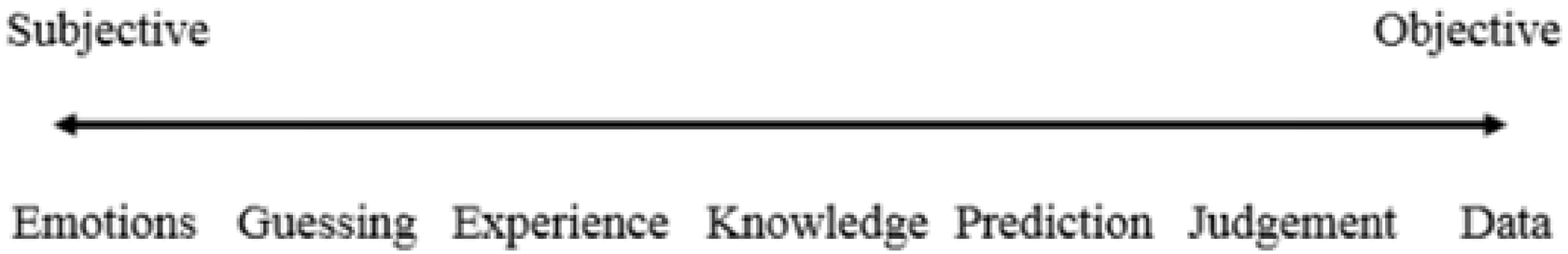
Qualitative -> Quantitative analysis

## WHERE TO INVEST?

What to teach?

To whom?

Reporting up and out

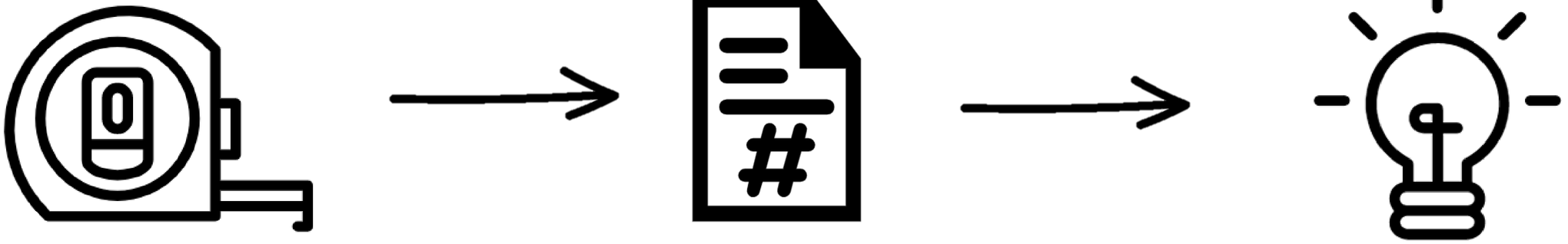


“When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of science”

Lord Kelvin, British physicist and member of the House of Lords, 1824-1907

“When you can measure what you are speaking about, and **express it in numbers**, you know something about it; but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of science”

Lord Kelvin, British physicist and member of the House of Lords, 1824-1907



Extracting information from the flat file system

What do you want to know?

Put the information somewhere you can access it

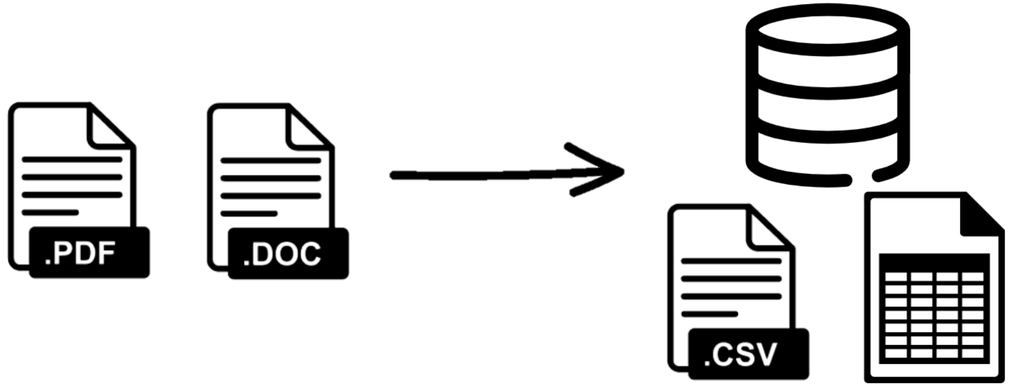
Get better

# Now the illustrated version…

When you can measure what you are speaking about, and express it in numbers, you know something about it.

# Challenges in AEC

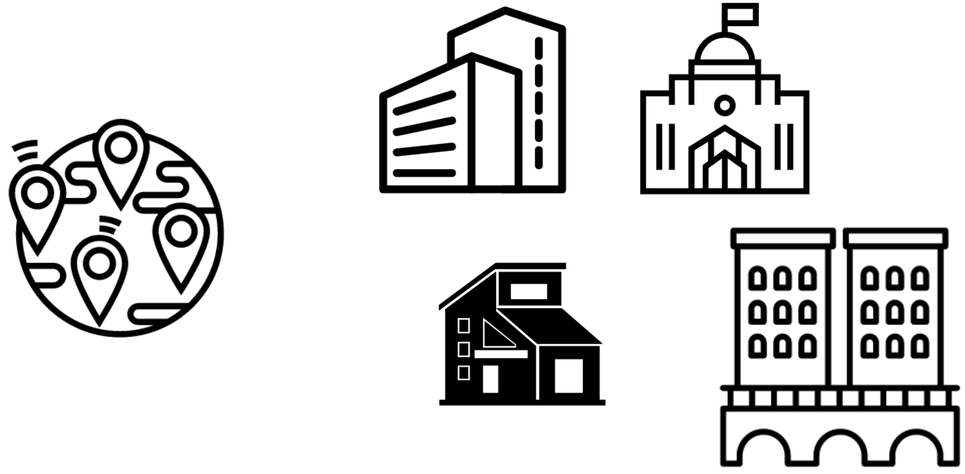
## UNSTRUCTURED DATA

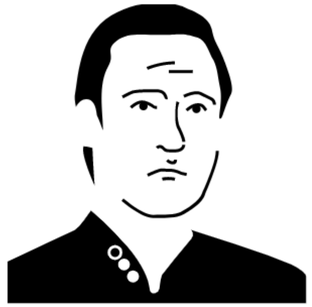
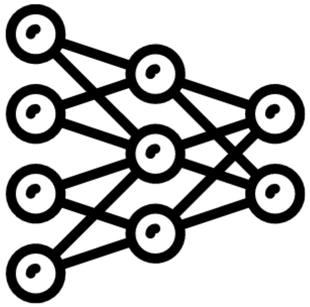
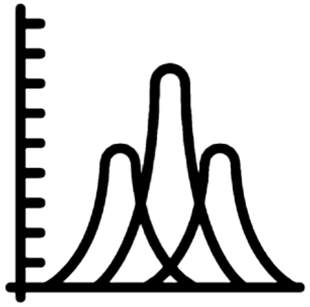



## CONSULTANTS

## MULTIPLE INTERNAL AUDIENCES

## MULTIPLE LOCATIONS / NEEDS



## Modeler

Expert with AEC production

Wants to understand and improve

Basic analysis

## Not a Data Scientist

Deep technical skill

Linking complicated data sets

Skilled statistical analysis

# 4 Basic Steps

## INVENTORY

WHAT DO YOU HAVE?

## COLLECT

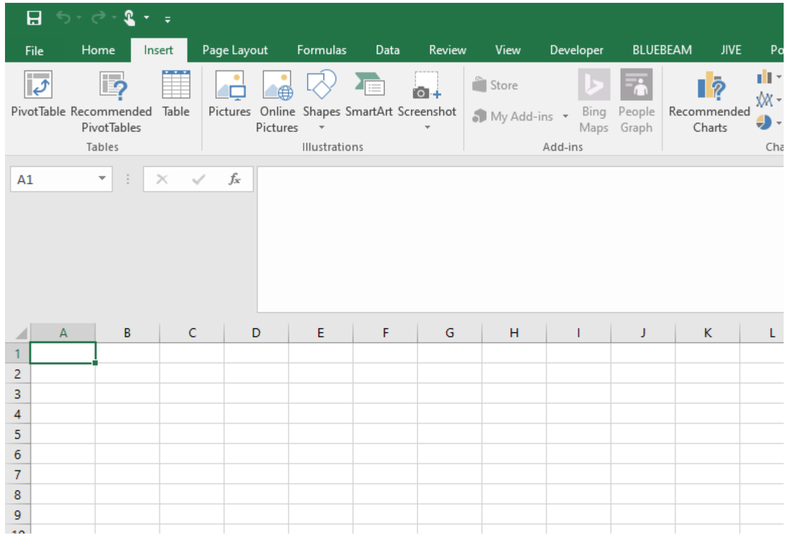
CENTRALIZE ACCESS

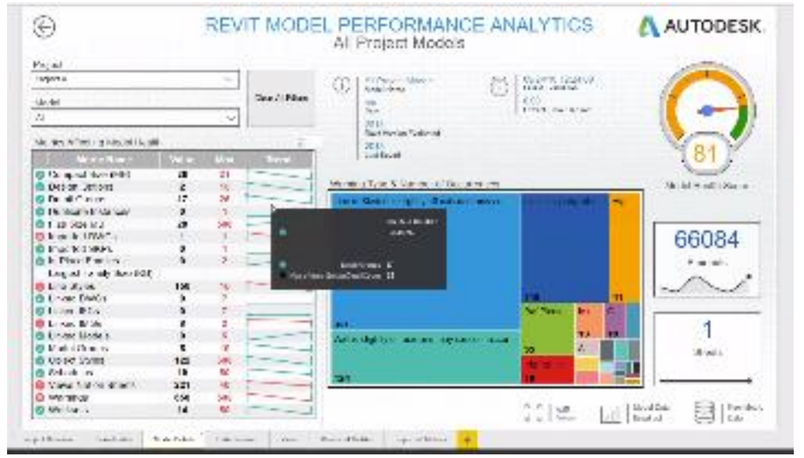
## VISUALIZE

FLEXIBLE AND POWERFUL

## INTERROGATE

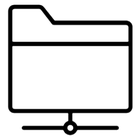
APPLY TO BUSINESS




# Why Dashboards?

# Bits and Pieces of the system



## RAW DATA

Revit models

- Shared Network Drive
- Revit Server
- BIM360 (ignored)

## STORAGE LOCATION

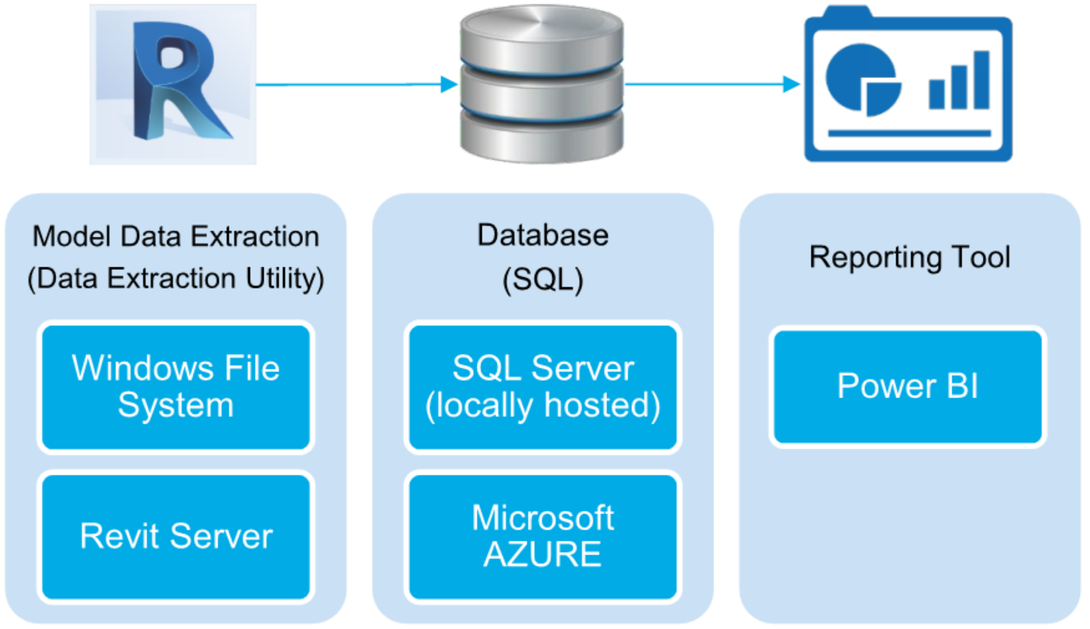
Structured database

## COLLECTOR

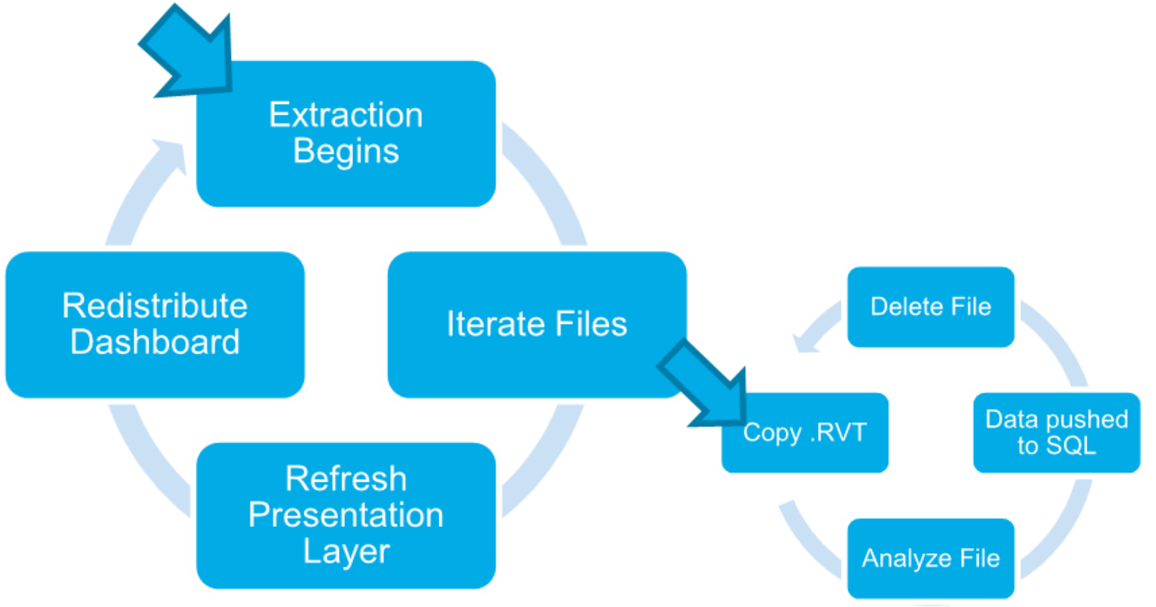
Autodesk Model Performance Analytics Dashboard (MPA)

## VISUALIZATION TOOL

Flexible and compelling interface




## Infrastructure




## Process

# Implementation Status

## PILOT RUNNING IN KANSAS CITY OFFICE

Collecting information on projects

Scheduled tasks

## CUSTOMIZING DASHBOARD

Created task group

Developing tailored views

# Opportunities

## DASHBOARD SYSTEM IN A BOX

New to EBA

Consulting support as force multiplier

Working system

## SUPPORT MULTIPLE PLATFORMS

Supported multiple Revit versions

Support Revit Server and Network storage

# Challenges

## IMPLEMENTATION

Requirements of MPA Extractor not met

## TAILORING TO OUR ENVIRONMENT

Scaling pilot up

Adjusting dashboards

# What have we learned?

## LOREM IPSUM

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras lacinia interdum odio, at cursus elit sagittis lobortis. Proin eu nisl molestie, dignissim ante ut, dictum ex.

## LOREM IPSUM

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras lacinia interdum odio, at cursus elit sagittis lobortis. Proin eu nisl molestie, dignissim ante ut, dictum ex.

## LOREM IPSUM

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras lacinia interdum odio, at cursus elit sagittis lobortis. Proin eu nisl molestie, dignissim ante ut, dictum ex.

# Is MPA the only option?

MISSION CONTROL (HOK)

BIM LINK (IDEATE)

MINECART (CASE)

DIY

# Jump Start

DYNAMO EXTRACTOR

POWERBI DASHBOARD

TT FILE FINDER / SORTER

PRATER
A Lindner Group Company

Thornton Tomasetti

# Resources

## BOOKS

- Randy Deutsch: Data-Driven Design and Construction
- Edward Tufte: The Visual Display of Quantitative Information
- More

## TRAINING

- PowerBI

  https://powerbi.microsoft.com/en-us/learning/

  https://docs.microsoft.com/en-us/power-bi/guided-learning/index

- AU Classes

  https://www.autodesk.com/autodesk-university/class/Great-Dynamo-Dig-Mining-Your-Revit-Model-Computation-Take-2-2015

  https://towardsdatascience.com/data-visualization-for-everyone-pt-1-68b443d29b87

## DASHBOARD TOOLS

- HoK: Mission Control
- Thornton Tomasetti: Thread / Design Explorer
- Proving Ground: Minecart

# Learning Objectives

1) DISCOVER THE VALUE OF MONITORING MODEL HEALTH

2) DISCOVER THE PROCESS OF SETTING UP THE REVIT MODEL ANALYTICS DASHBOARD IN AN AEC FIRM

3) DISCOVER ALTERNATIVE DASHBOARDS FOR MONITORING MODEL HEALTH

4) LEARN ABOUT THE IMPLICATIONS TO DAILY MODELING PRACTICE AS A RESULT OF MONITORING MODELS

AUTODESK®

Make anything™

Autodesk and the Autodesk logo are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product and services offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2019 Autodesk. All rights reserved.