



# DIGITAL TRANSFORMATION & BIM IMPLEMENTATION FOR SMALL MEDIUM ENTERPRISE

Ciaran O'Brien & Yeu Yeu Ng  
O'Brien Finucane Architects

# Who we are

## Ciaran

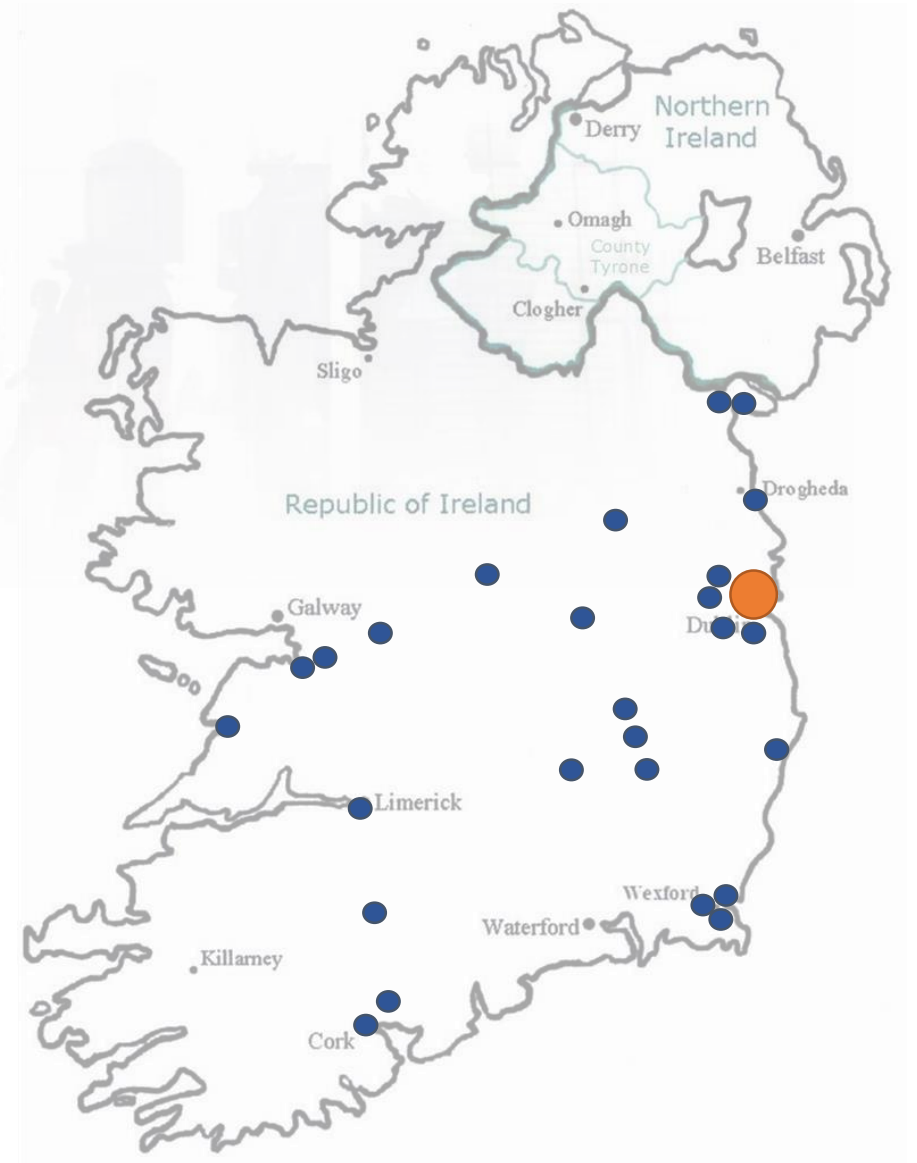
- In practice for 24 years.
- RIAI Registered Architect
- Extensive experience in Procurement & Contract Administration
- Business Owner and Company Director

## Yeu Yeu

- More than 6 years in AEC and Technology
- 5 years working in Singapore.
- Design & Technology Management
- Experience with international consultants including Autodesk APAC.
- Architectural and Technology Specialist

## O'Brien Finucane Architects (OBFA) Design led practice working nationally.

- 7 Years old.
- Staff of 12
- Public and Private Sector portfolios
- Approaching all projects on BIM processes and standards.

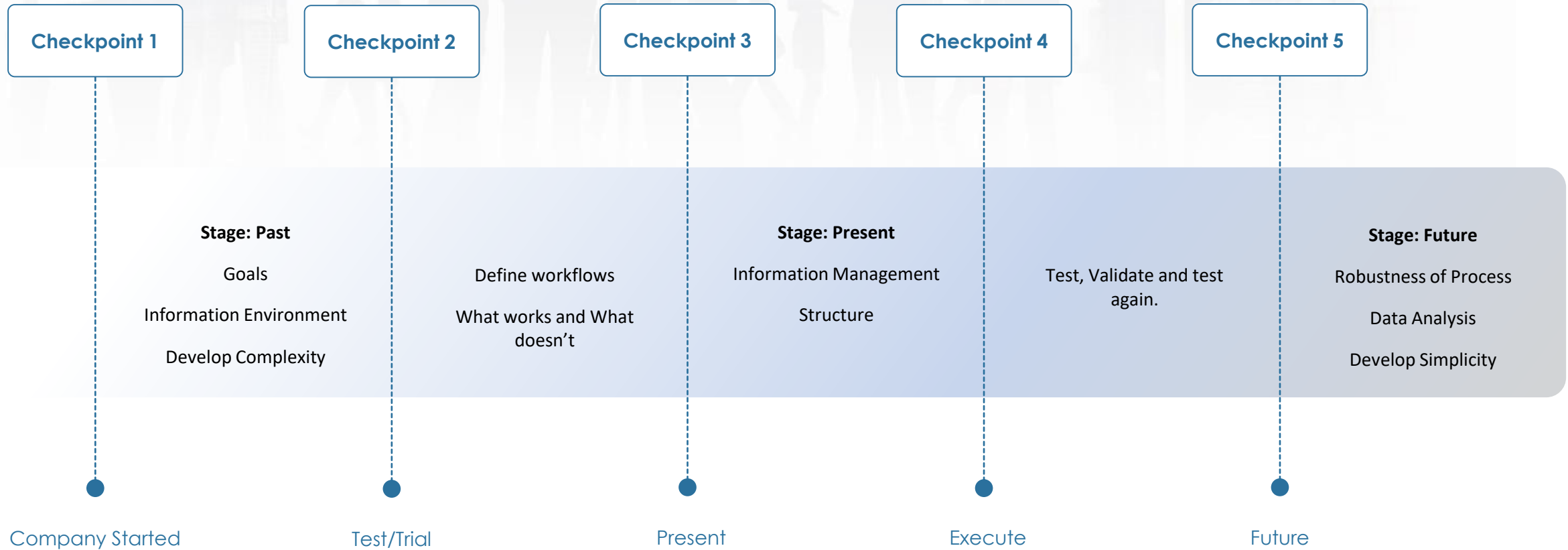


# Premise of this case study?



*'Digital transformation is not about technology. According to a recent survey, 70% of all digital transformation initiatives do not reach their goals. 1.3 trillion dollars was spent on digital transformation in year 2018, and it was estimated 900 billion went to waste.'* (Behnam 2019)

# Roadmap



## Phase 1 - Past

- 2012 – 2016 – Transition Arrangement

New Business with transitional commissions/projects.

Opportunity to make a very clean jump to a new process at lowest risk point.

- Platform Commitment / Formalised Training

Recognition that partner consultants (Engineering and QS), heavily invested in set drawing environment.

Evident commitment to Irish Market at all scales.

Opportunity Cost was relatively low at practice start.



## What Worked And What Did Not...

### **BIM Enabling Process's**

Learning about the tools and methodologies that could enable BIM process.

Access to young graduates with specific experience that could be directed.

Access to practical training to allow directors to go 'back on the tools'.

Time needed to bring partner consultants and clients with us.

### **BIM Implementation Process's**

Clients not yet asking for BIM

Immediate attempts to shape large processes within a small project environment.

Imposition of speculative experience that could not be applied.

Potential over reliance on larger businesses' legacy/established systems



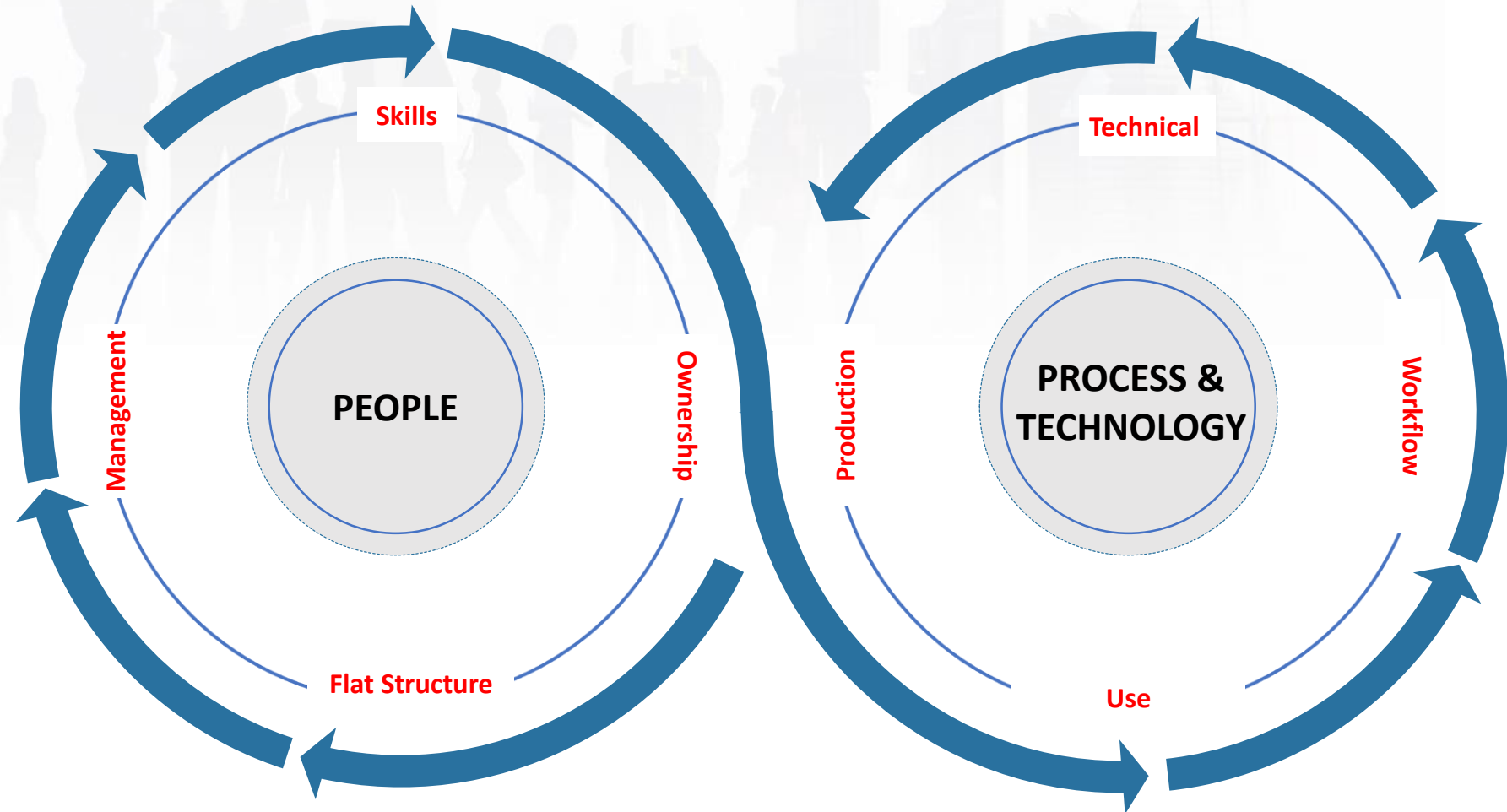
## Phase 2 - Present

Accommodating demands that are broad and fundamental, but not legal or regulatory.



## Key Focus

- The People
- The Process
- The Technology



## Key Areas

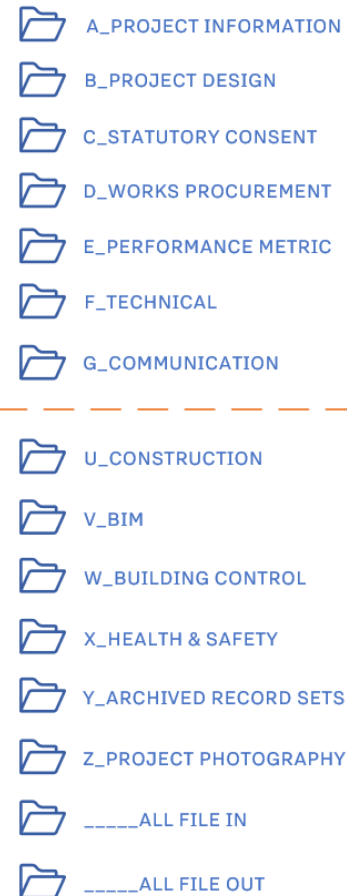
- Information Management & Standardisation
  - How Information Is **Stored**, **Checked**, **Shared**
  - Standardisation Of How That Information Is Addressed
- Model Structure And Process
- Introduce New Process - E.T.I

# HOW OUR INFORMATION IS STORED

## Traditional Folder Structure

- Retained with the practice.
- Flexible for project or practice growth and contraction.

### Previous (Complex)



### Current (Simple)



Work Stage – Based on contract  
BIM Collaboration & Modelling

## How To Verify & Check?

- Naming
- Save file location

# HOW OUR INFORMATION IS CHECKED

## Simple command line script

```

C:\> Command Prompt

Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

:\WINDOWS\system32>U:

:\>cd U:\obfa_2018\1828_GCC_KINVARA_(AUG18)_XXXXX

:\obfa_2018\1828_GCC_KINVARA_(AUG18)_XXXXX>/tree /?
/tree' is not recognized as an internal or external command,
operable program or batch file.

:\obfa_2018\1828_GCC_KINVARA_(AUG18)_XXXXX>tree /?
graphically displays the folder structure of a drive or path.

TREE [drive:][path] [/F] [/A]

    /F    Display the names of the files in each folder.
    /A    Use ASCII instead of extended characters.

:\obfa_2018\1828_GCC_KINVARA_(AUG18)_XXXXX>tree /f /a > fileoutput.txt

:\obfa_2018\1828_GCC_KINVARA_(AUG18)_XXXXX>_
  
```

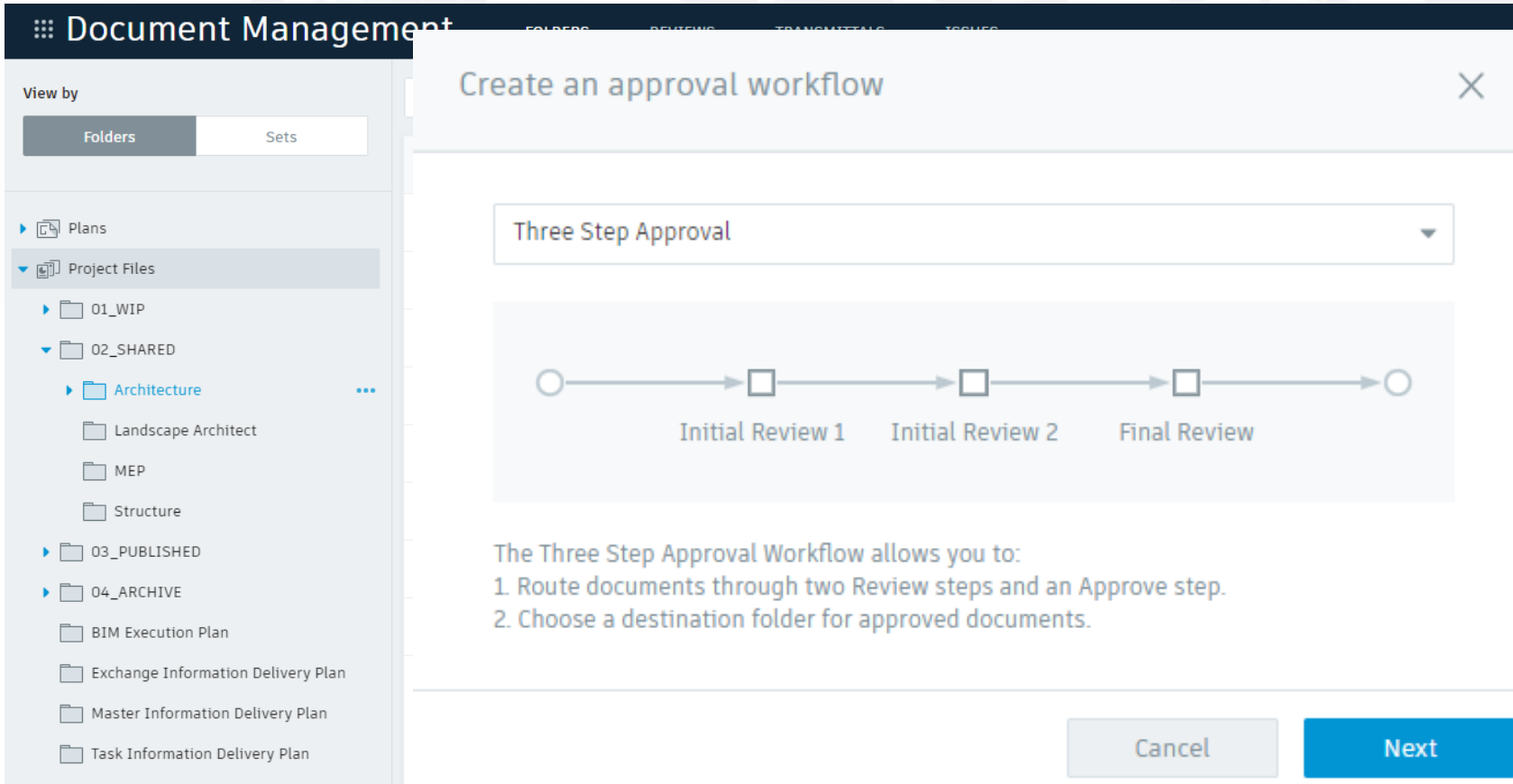


```

U:.
  outout.txt
+---0000___READ ME FIRST_2018
  | DISCIPLINE CODES_PLEASE USE.docx
  | s1800___SAMPLE Criteria Response part 2.pdf
  | s1800___SAMPLE Criteria Response.pdf
  | s1800___SAMPLE Report part 2.pdf
  | s1800___SAMPLE Report.pdf
+---18xx A. PROJECT INFORMATION_(MMYY)
  | +---A1_Assigned Roles
  | +---A2_Contact List
  | \---A3_Project Plan
+---18xx B. PROJECT DESIGN_(MMYY)
  | \---New folder
+---18xx C. STATUTORY CONSENTS_(MMYY)
  | +---17xxB1_PLANNING
  | +---17xxB2_FSC
  | \---17xxB3_DAC
+---18xx D. WORKS PROCUREMENT_(MMYY)
+---18xx E. PERFORMANCE METRIC
  | HPI Credits Checklist.xlsx
  | HPI technical manual v1 - final v3 (1).pdf
  | NZEB Summary.pdf
+---18xx F. TECHNICAL
+---18xx G. COMMUNICATIONS
+---18xx H. --- CONSTR
  | +---U0_GUIDANCE
  | +---U1_CERTIFICATION
  | +---U2_MEETINGS
  | +---U3_RFI-ERPI-D
  | +---U4_ERPI-D
  | \---U5_SUBMITTALS
+---18xx V. --- BIM
  | +---01-WIP
  | +---BIM
  | +---CAD
  | +---Export
  | +---Families
  | +---SheetFiles
  | \---WIP_TSA
  | +---02-Shared
  | +---03-Published
  | +---04-Archived
  | +---05-Incoming
  | +---Source01_(Surveyor)
  | +---Source02_(CSEng)
  | +---Source03_(SRVEng)
  | \---Source04_(QS)
  | \---06-Resource
  | +---Logos
  | +---Project Specific Standards
  | \---Titleblocks
  
```

Yes. still (kinda) manual check  
Its sufficient for SME

# HOW OUR INFORMATION IS SHARED (CHECKED)



- Cost Effective
- Included In Package
- Transmittal

Additional:  
Open to variety of plugins and add-ins

**Checked:** Three Steps Approval

1. Project BIM Lead review
2. Design Lead review
3. Director review

## BIM 360 DOCUMENT MANAGEMENT

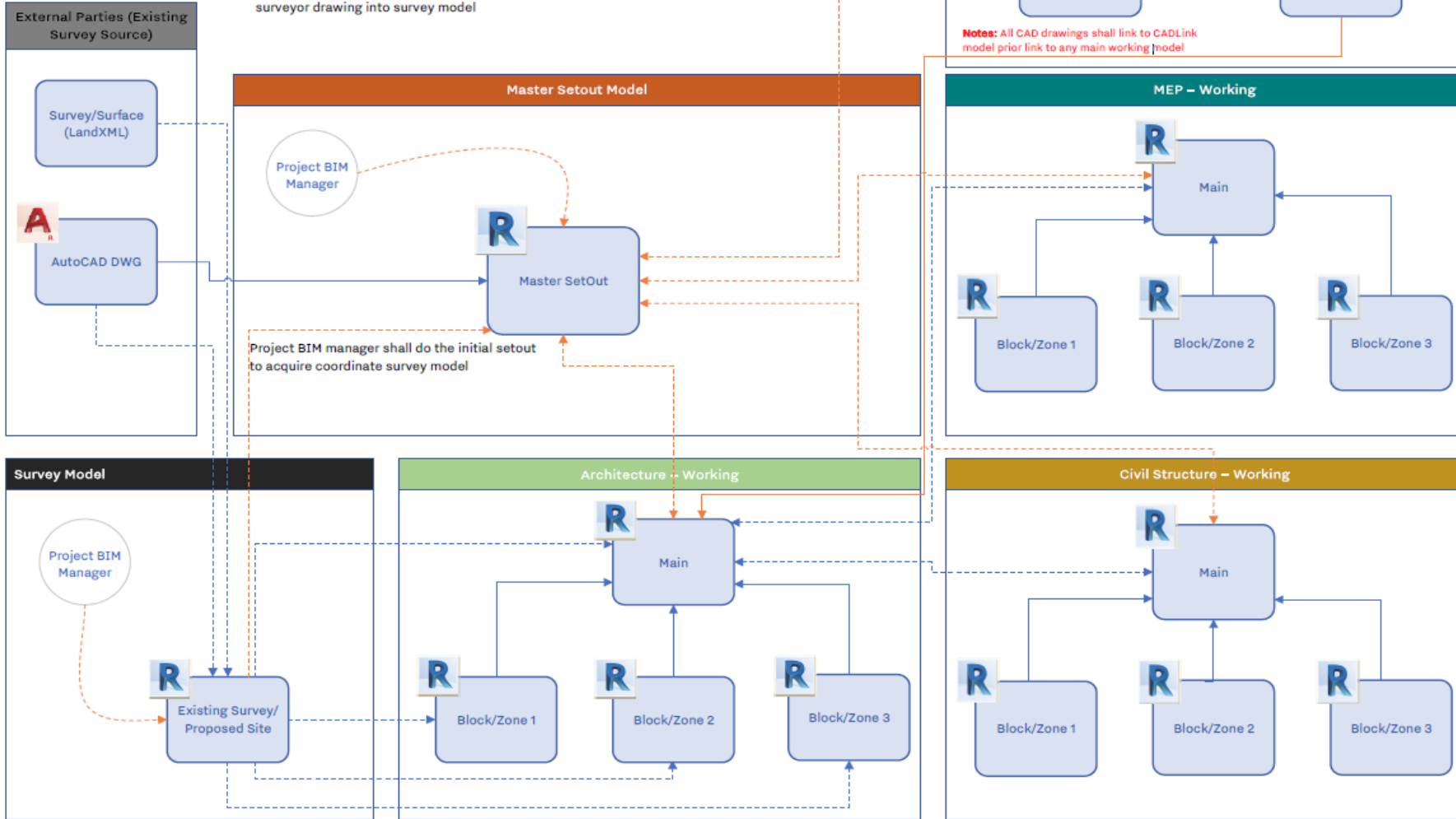
If client requested

- Model Content Requirement – Uniclass information

[illegible]

## Model Structure

Project BIM manager shall do the initial setout to acquire coordinate from surveyor drawing into survey model



# HOW OUR MODEL INFORMATION IS STRUCTURED

## Model Structure & Process

- Identify Project Brief
- Model structure by zone/block
- Information Flow to disciplines

This workflow is compatible with all the principal platforms



# Early Contractor Involvement



## Early Technologist Involvement

- Responsible setup modelling information
- Responsible information gathering (exchange format)
- Multiple role – Project information / BIM Manager / BIM coordinator

### Sub-process:

- Project Kick Off Session
- 'Stand Up' Meeting - Originally from I.T industry



## BIM Maturity

- Strategy
- BIM Use
- Process
- Data Structure
- Infrastructure

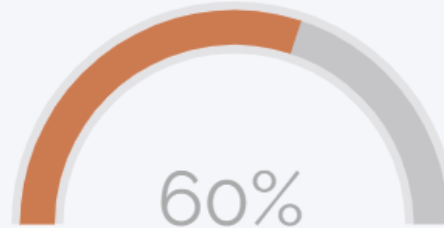
2018

### BIM Readiness

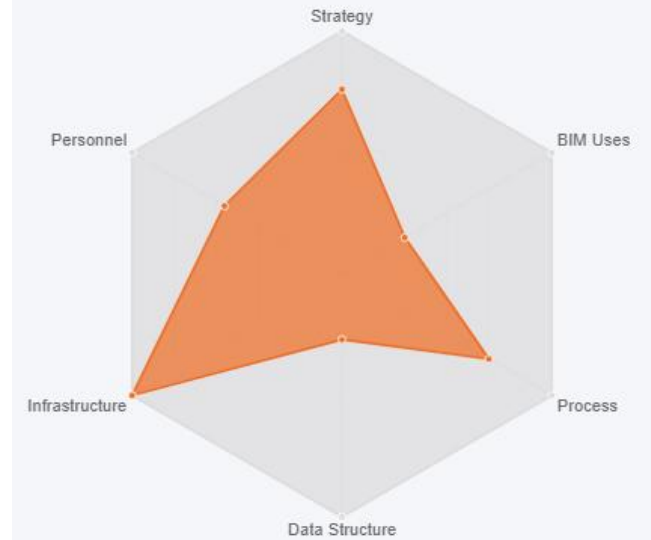
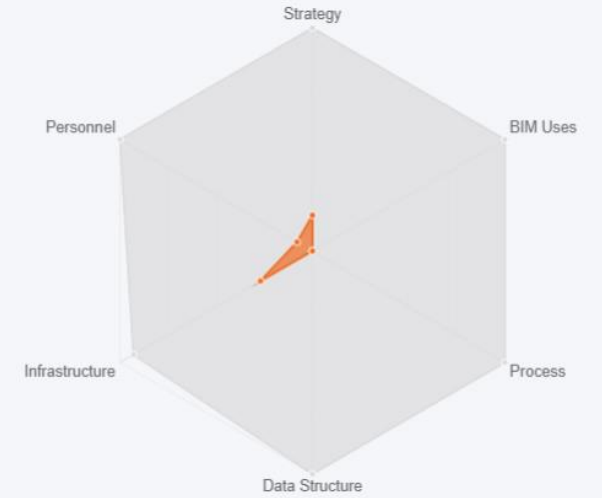


2019

### BIM Readiness



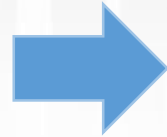
Phase 2 - Present



Online Assessment: BIMConnect Profile

## Phase 3 - Future

Technology



Data Analysis  
(Approach To Machine Learning)

Management



Robustness Of Process

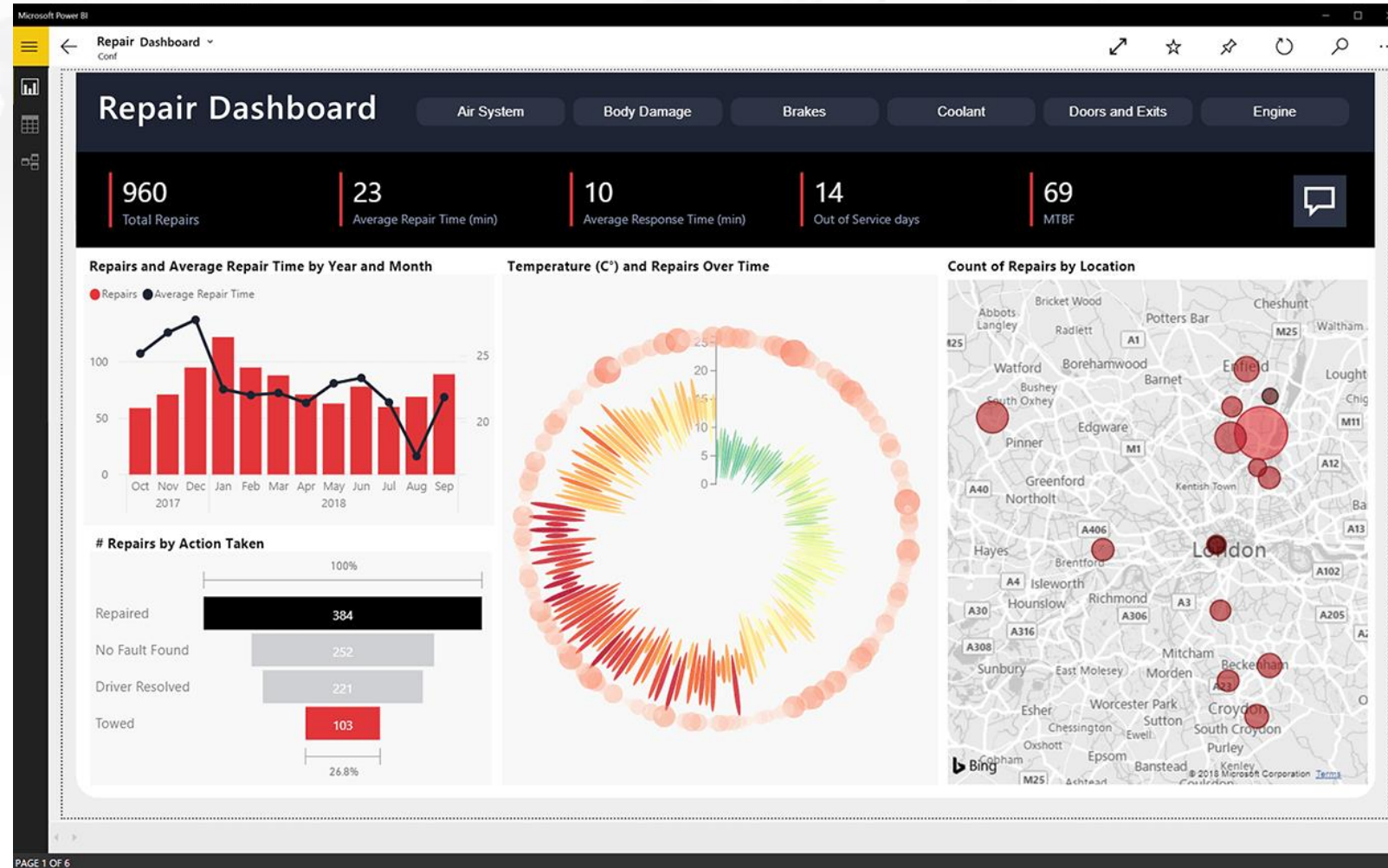
## Data Analysis

*Data analysis is a process of inspecting, cleansing, transforming and modelling data with the goal of discovering useful information, informing conclusions and supporting decision-making.*

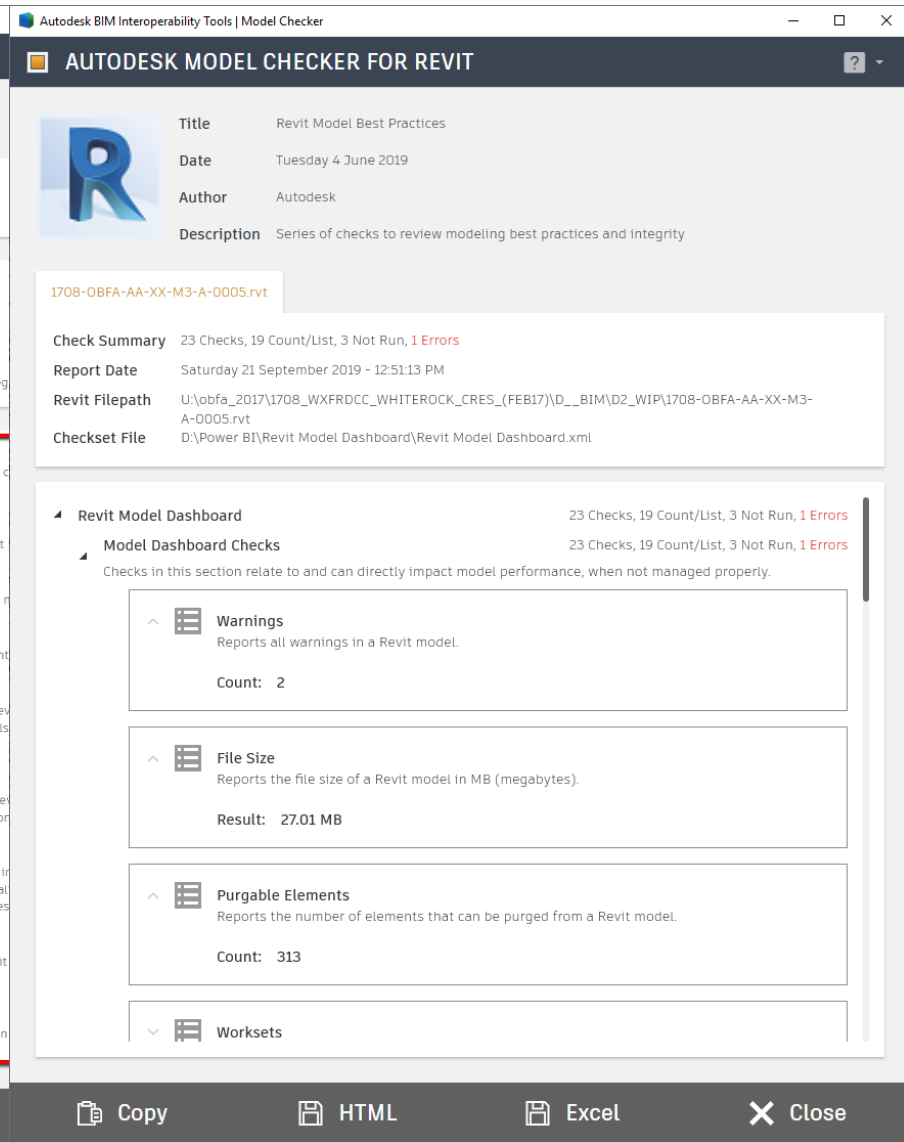
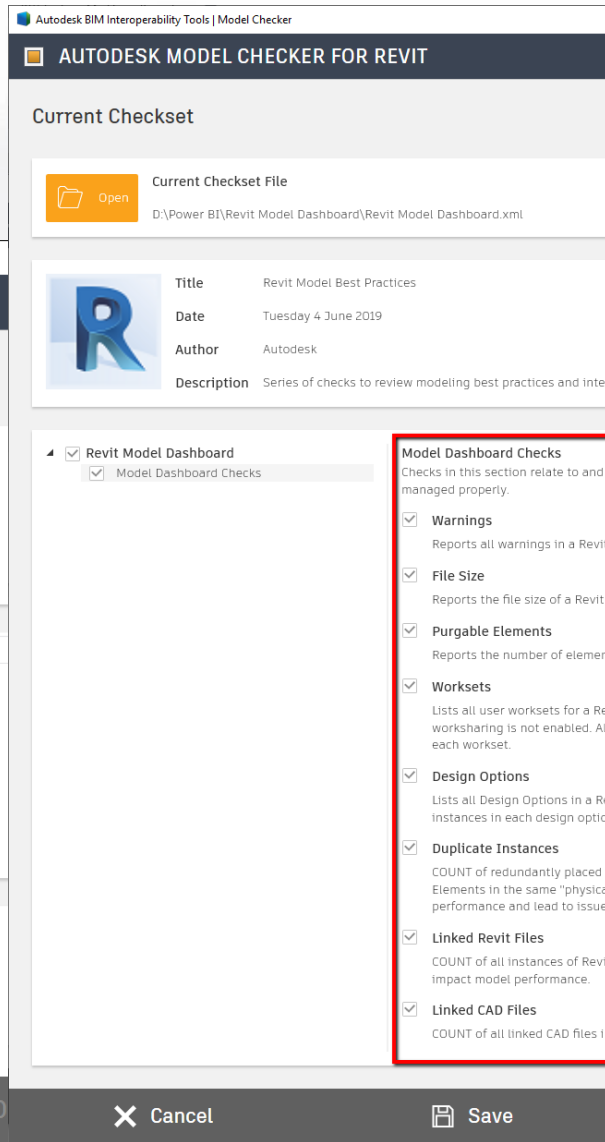
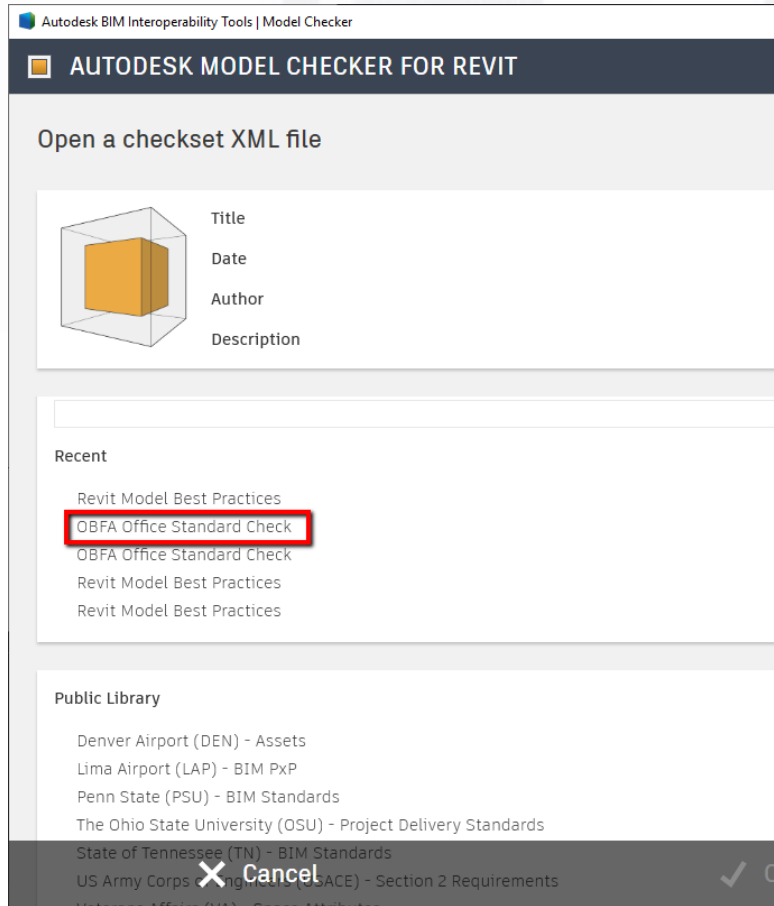
## Microsoft Power BI

*Power BI is a business analytics service that delivers insights to enable fast, informed decisions.*

Source: Microsoft



# Autodesk Model Checker



FREE!

# Autodesk Model Checker

Autodesk BIM Interoperability Tools | Model Checker

**AUTODESK MODEL CHECKER FOR REVIT**

**Title** Revit Model Best Practices  
**Date** Tuesday 4 June 2019  
**Author** Autodesk  
**Description** Series of checks to review modeling best practices and integrity

1708-OBFA-AA-XX-M3-A-0005.rvt

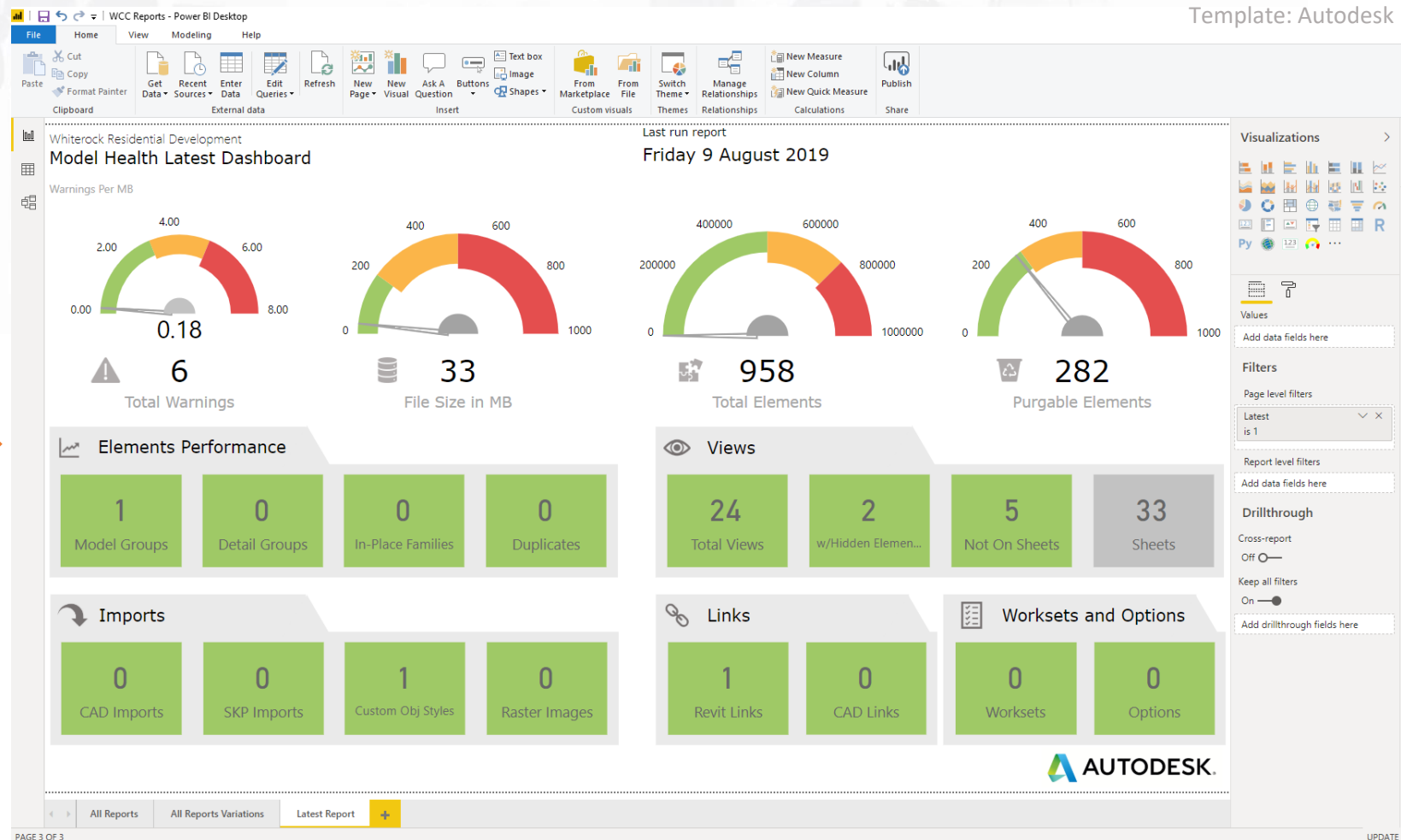
**Check Summary** 23 Checks, 19 Count/List, 3 Not Run, 1 Errors  
**Report Date** Saturday 21 September 2019 - 12:51:13 PM  
**Revit Filepath** U:\obfa\_2017\1708\_WXFRDCC\_WHITELOCK\_CRES\_(FEB17)\D\_\_BIM\02\_WIP\1708-OBFA-AA-XX-M3-A-0005.rvt  
**Checkset File** D:\Power BI\Revit Model Dashboard\Revit Model Dashboard.xml

**Revit Model Dashboard** 23 Checks, 19 Count/List, 3 Not Run, 1 Errors  
**Model Dashboard Checks** 23 Checks, 19 Count/List, 3 Not Run, 1 Errors  
 Checks in this section relate to and can directly impact model performance, when not managed properly.

- Warnings**  
Reports all warnings in a Revit model.  
Count: 2
- File Size**  
Reports the file size of a Revit model in MB (megabytes).  
Result: 27.01 MB
- Purgable Elements**  
Reports the number of elements that can be purged from a Revit model.  
Count: 313
- Worksets**

Copy HTML Excel Close

# Microsoft Power BI

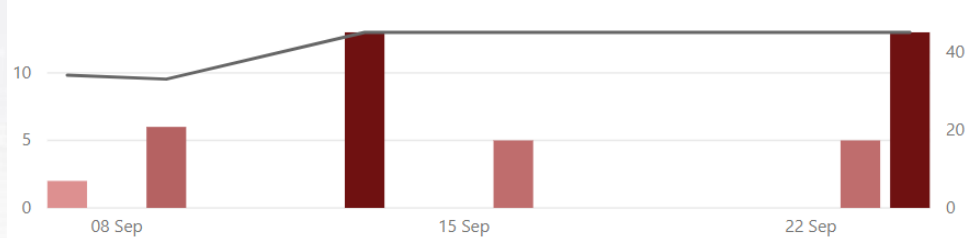




## Whiterock Apartment Type C Model Health Trend Dashboard

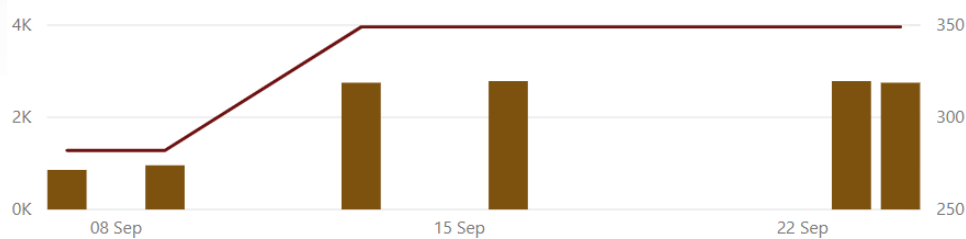
Warnings and File Size by Report Date

Warnings File Size



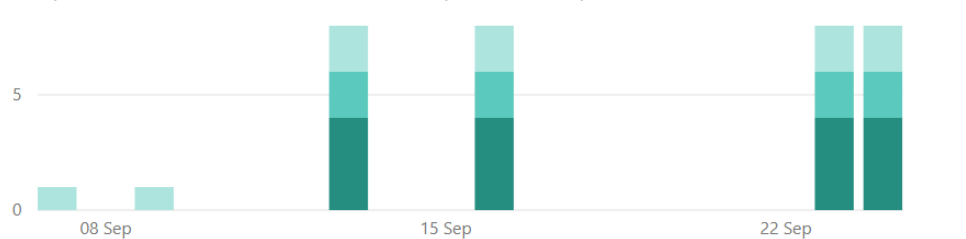
Total Elements and Purgable Elements by Report Date

Total Elements Purgable Elements



Duplicate Instances, In-Place Families, Detail Groups and Model Groups by Report Date

Duplicate Instances In-Place Families Detail Groups Model Groups

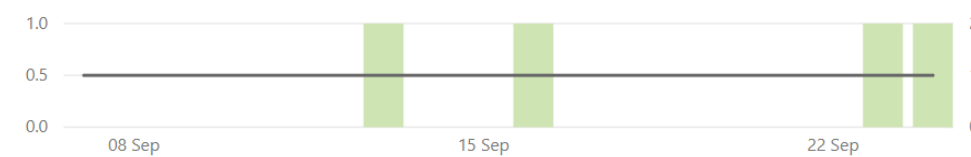


### Last run report

Tuesday 24 September 2019

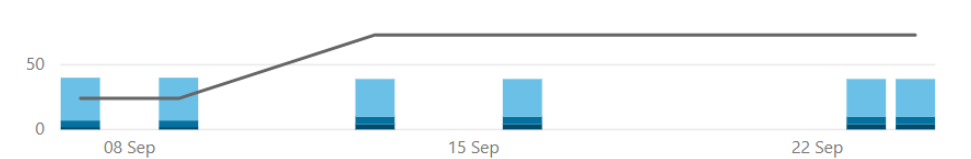
Imported CAD files, Imported SKP files, Raster Images and Non built-in Object Styles by Report Date

Imported CAD files Imported SKP files Raster Images Non built-in Object Styles



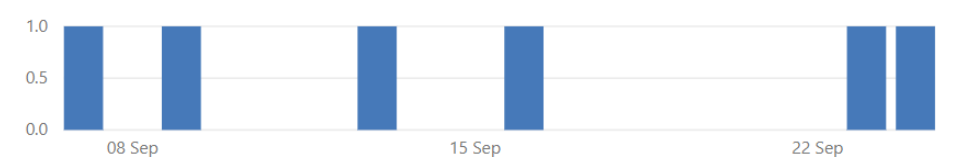
Views with Hidden Model Elements, Views Not On Sheets, Sheets and Views by Report Date

Views with Hidden Model Elements Views Not On Sheets Sheets Views



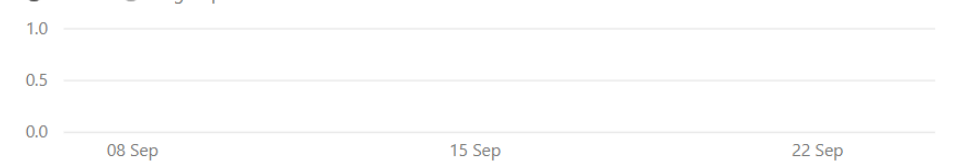
Linked CAD Files and Linked Revit Files by Report Date

Linked CAD Files Linked Revit Files



Worksets and Design Options by Report Date

Worksets Design Options

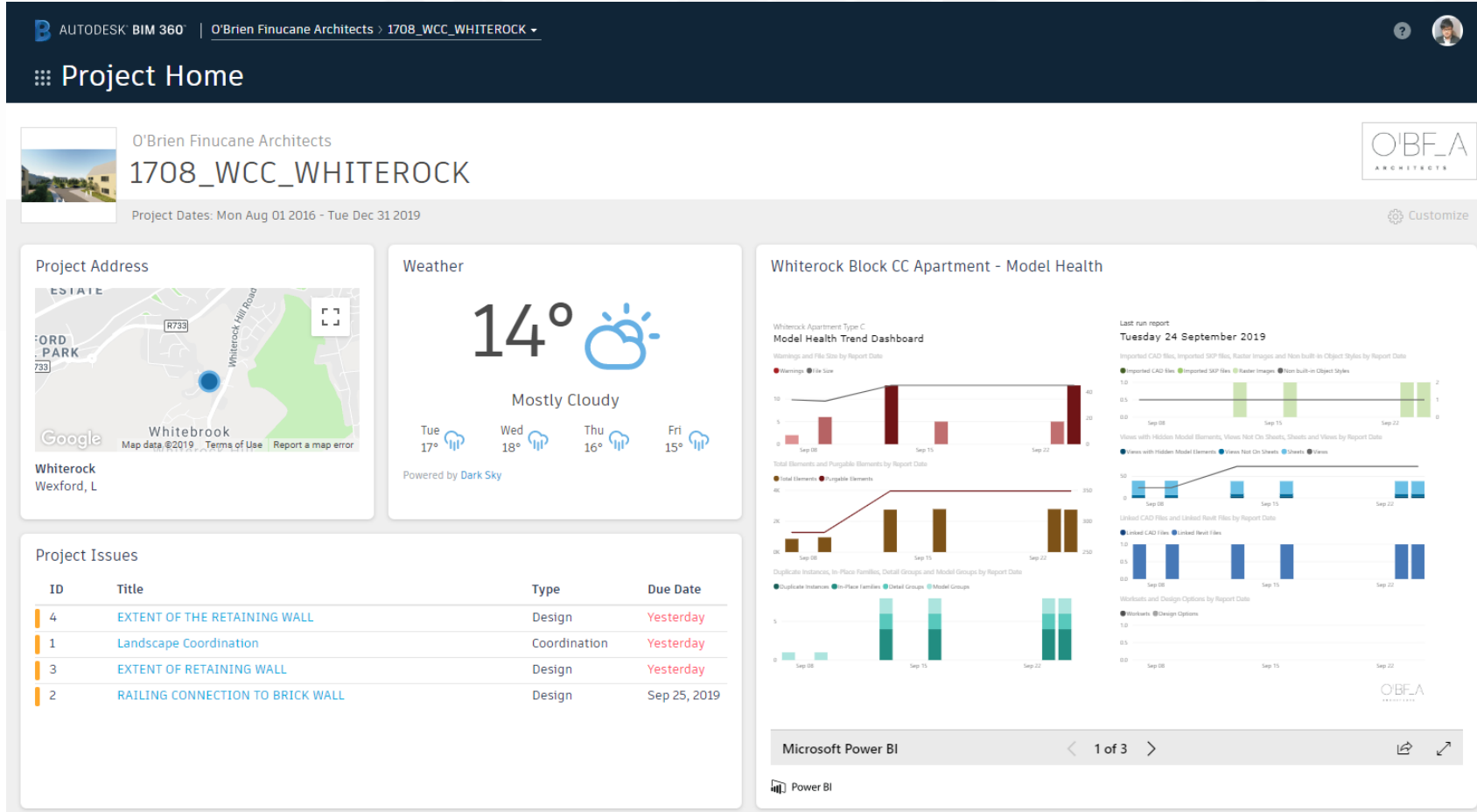


## DASHBOARD

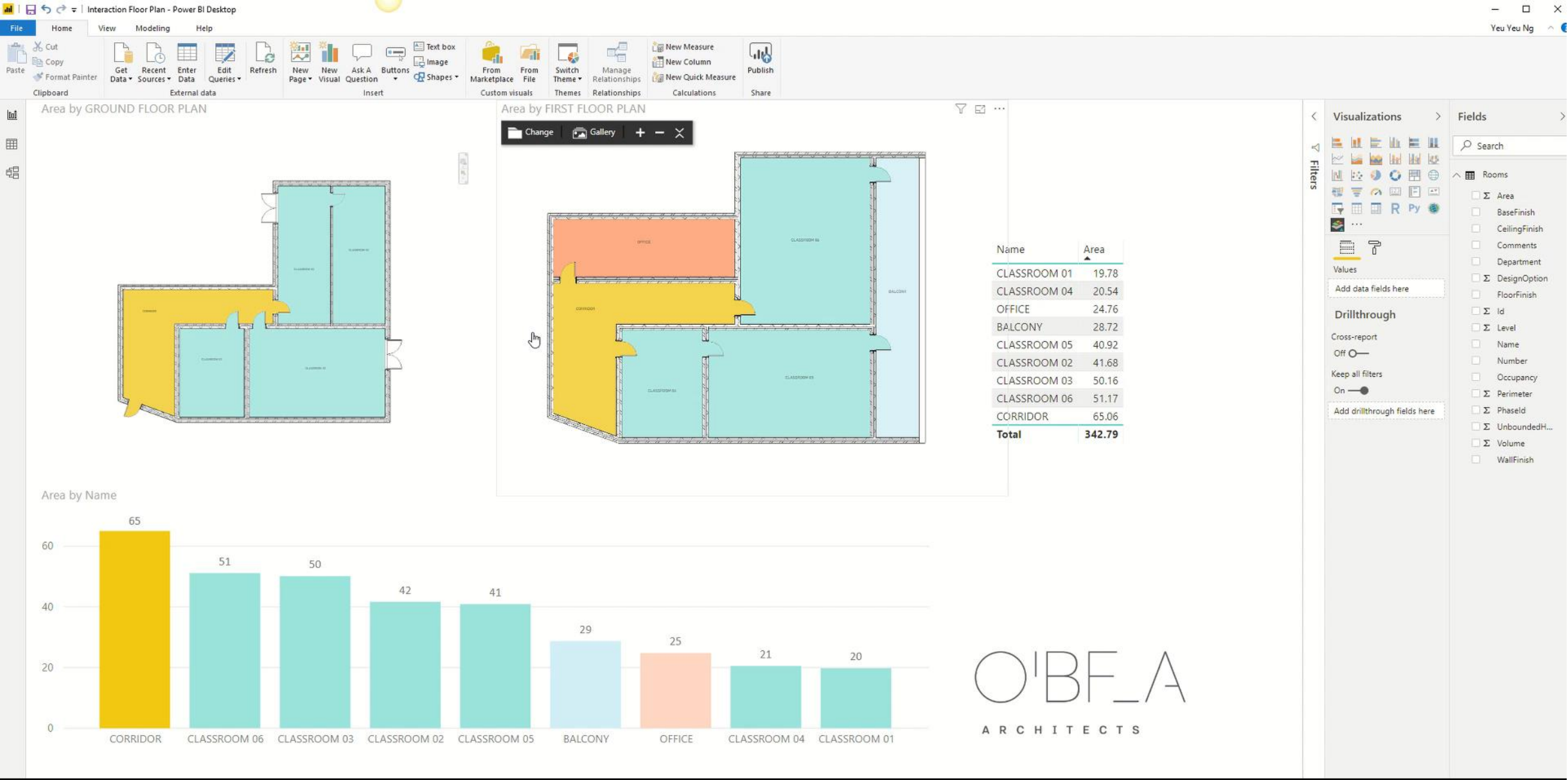
- Report generated from Model Checker
- Health Trend on model



# Integration Power BI to CDE



- Turn Model Data Into Visual Data
- Live Monitor Of Latest Model Data
- Integrate Power BI directly into Project CDE



## ROBUSTNESS OF PROCESS

Pace of Change – Faster than individual projects are completed.

Use the outcome of 'Lessons Learned'

Position business to be able to respond to Procurement Mandate

Challenges / Solutions for Small Practice

# 5 Step Approach





# Thank you

Speaker feedback is much appreciated