Welcome!

The Business Model of Custom Tools

Tuesday, February 16, 2016 2:00 PM - 3:00 PM ET

Earn 1.0 AIA LU

Moderator

Cory Brugger

Cory Brugger's diverse background and education supports the collaborative and multidisciplinary approach towards design that distinguishes Morphosis as an industry leader in technological innovation and integration in architecture. Since joining Morphosis in 2010, Mr. Brugger has managed the development and implementation of advanced design technology in the office. He provides day-to-day oversight of BIM integration and CAD production for Morphosis and its multidisciplinary project teams. For over ten years he has successfully managed the integration of CAD and BIM technologies on projects ranging from residential design-build to high-rise office towers. At Morphosis, Mr. Brugger's primary focus has been the integration of virtual building models into design and delivery processes.

Speaker

Zigmund Rubel, AIA

Zigmund Rubel, AIA is a licensed architect advocating Integrated Project Delivery in healthy, healing and sustainable environments. He is a founder of Aditazz, a technology startup in Northern California whose mission is to revolutionize current methods of designing, constructing and operating healthcare facilities by leveraging proven design and manufacturing techniques from other industries. Aditazz also aims to automate repetitive tasks in building design flow and enable the use of advanced manufacturing techniques in the construction process. Their key goal is to provide faster realization of health care facilities with improved construction quality and reduced operational costs.

Speaker

Corey Johnson

Corey Johnson is the Director of Product Management, Visual Solutions, InEight. In his current role, Corey is responsible for delivering maximum value from InfinyD across Web, Mobile and Workstation based platforms. Previously, as a Manager of Virtual Construction for Kiewit Corporation, providing construction services in markets including transportation, water/wastewater, heavy civil, power, oil, gas and chemical, building and mining. Prior to that he spent five plus years with Bentley Systems as a Solutions Engineer serving the Transportation and Local Infrastructure Market with a focus on DOT's and Large Engineering firms. Corey has spent the past 20 years working in the design engineering, software and construction industries.

Speaker

Stewart Carroll

Stewart Carroll is the Chief Operating Officer of Beck Technology, developers of DESTINI Profiler and DESTINI Estimator, based in Dallas. For over two decades, he has been a lead A/E/C technologist and continually speaks on the integration of cost and scoping technologies to owners and developers.

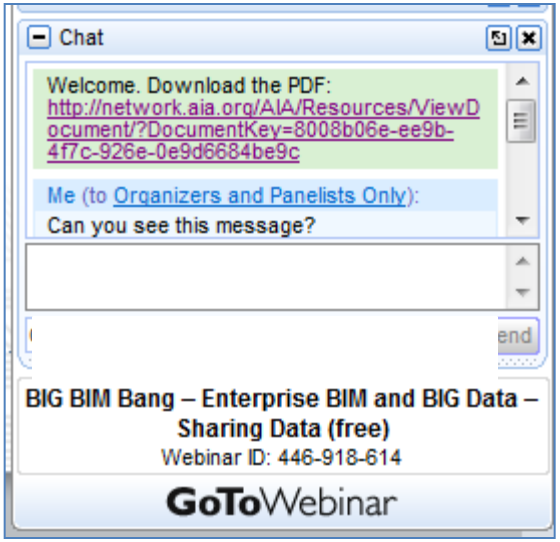
Speaker

Jeff Ratcliff, CHC is Director of Preconstruction with The Beck Group in Dallas. With nearly 15 years of project management experience, he is skilled at managing construction in critical care facilities while building valuable relationships with owners and team members. Jeff received his Bachelor of Science in construction science from the University of Louisiana at Monroe.

Jeff Ratcliff, CHC

Questions?

Submit a question to the moderator via the chat box.



Content-related questions will be answered during the Q&A portion at the end as time allows.

Tech support questions will be answered by AIA staff promptly.

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Follow the link provided:

- **in the Chat box** at the conclusion of the live presentation;
- **in the follow-up email** you will receive one hour after the webinar.

Course Description

This seminar will explore how AECO firms are developing custom-built tools to improve the design, construction and management of buildings. The expansion of bespoke technology solutions has created new business markets where offices can sell and support proprietary tools and processes to the broader design and construction industry. Examples drawn from practice will illustrate how the development of these tools has provided new business opportunities through innovation in architectural practice.

Learning Objectives

1. Describe how custom tools are influencing the range of services a business can provide.
2. Relate the development of new tools and processes to the practice of architecture.
3. Identify opportunities within their own practice to leverage new or custom tools.
4. Assess the benefit of developing new tools as a model for business growth.

BUILDING THE RIGHT BUILDING

From Silica to buildings

The Business Model of Custom Tools

February 16, 2016

Zigmund Rubel, AIA

Co-founder, ADITAZZ

DON'T JUST CONSUME TECHNOLOGY

Make It

What's the business model?

Agenda

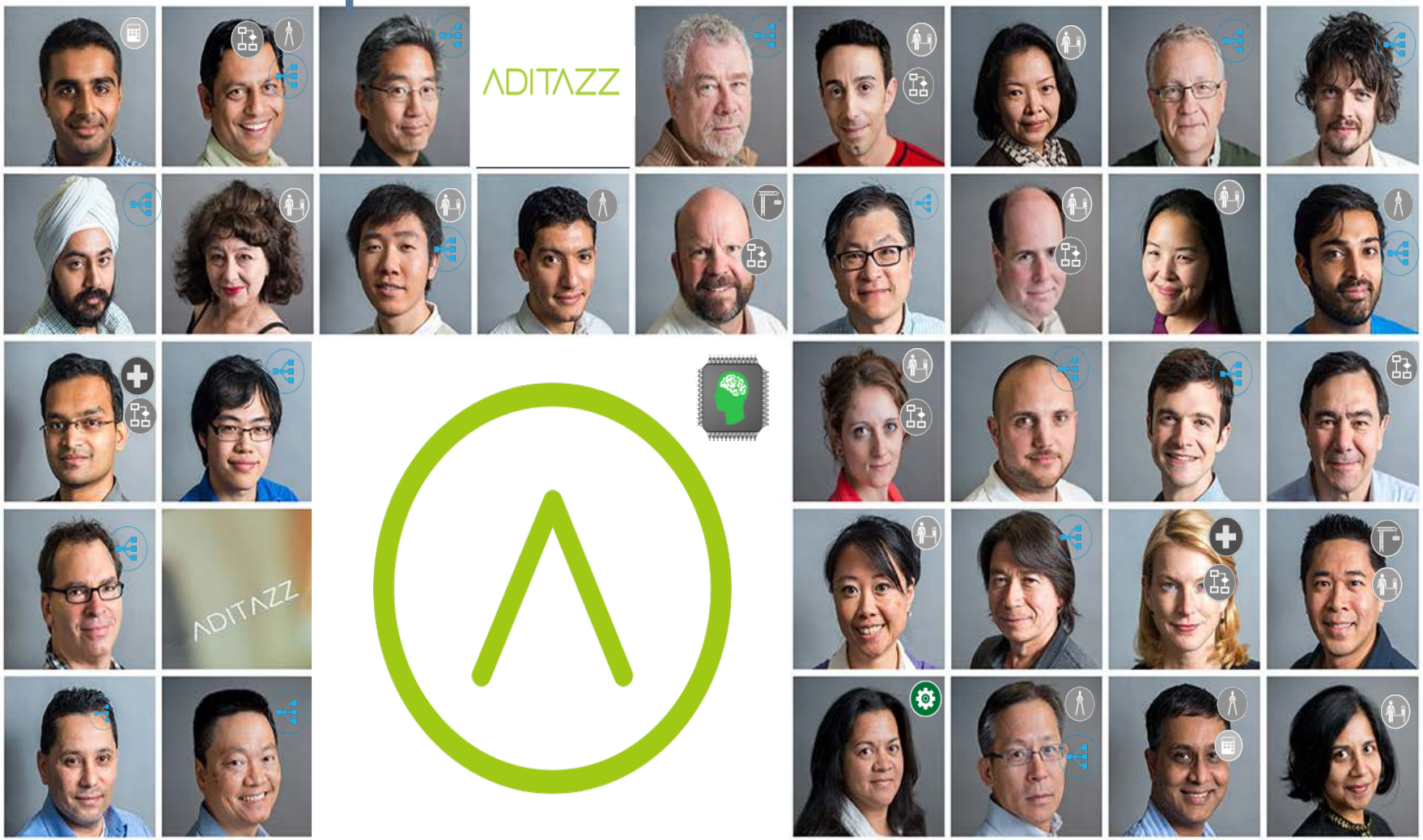
- Aditazz
- Why and what is our different
- business model
- Case Studies
- Final Thoughts

Aaditas आदितस्

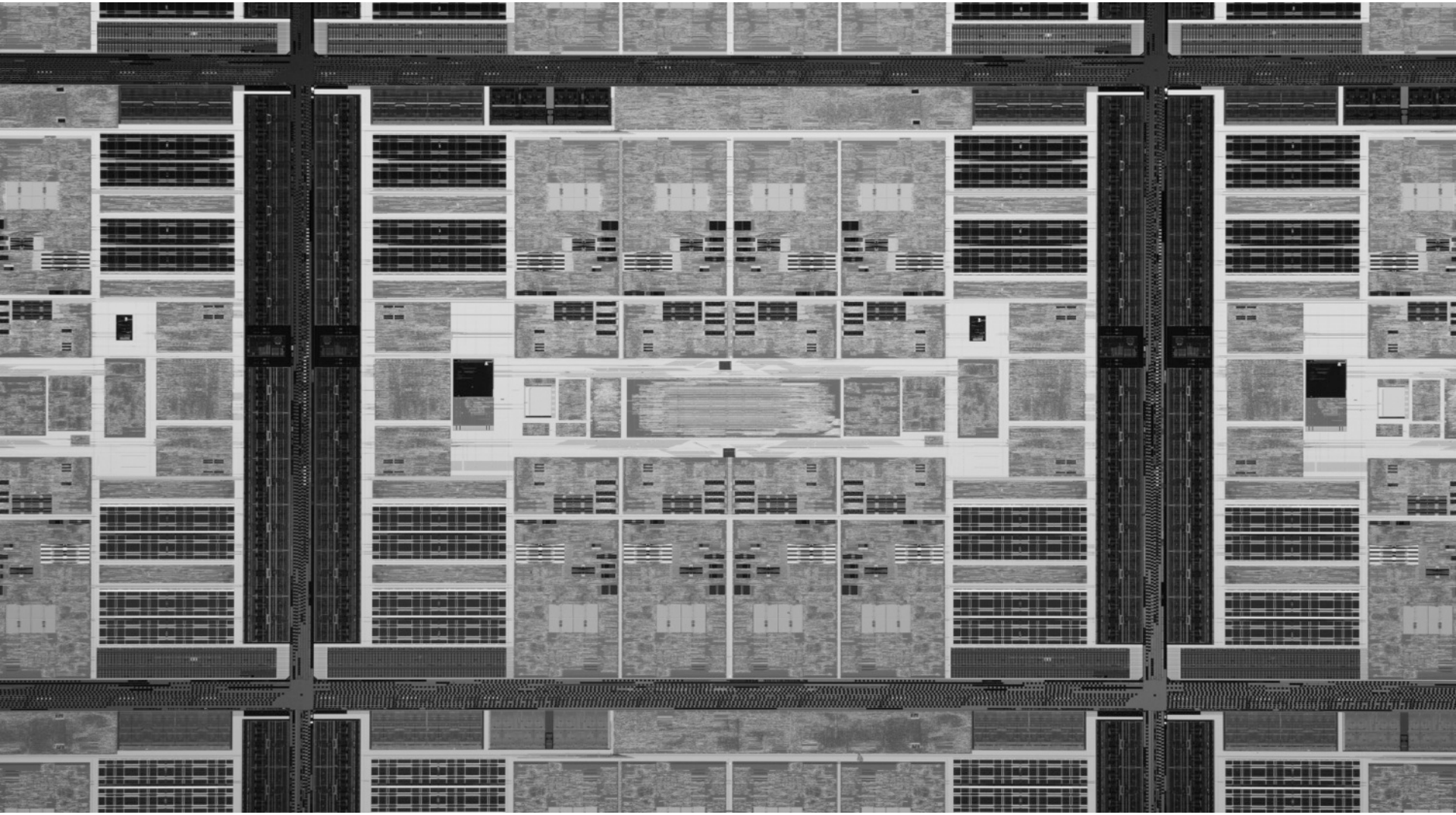
From the beginning

Integrated, Multi-Disciplinary Team

The Unique Aditazz Culture



Silicon Valley meets the AEC



Business Model

The current business model

Construction cost

X

Percentage

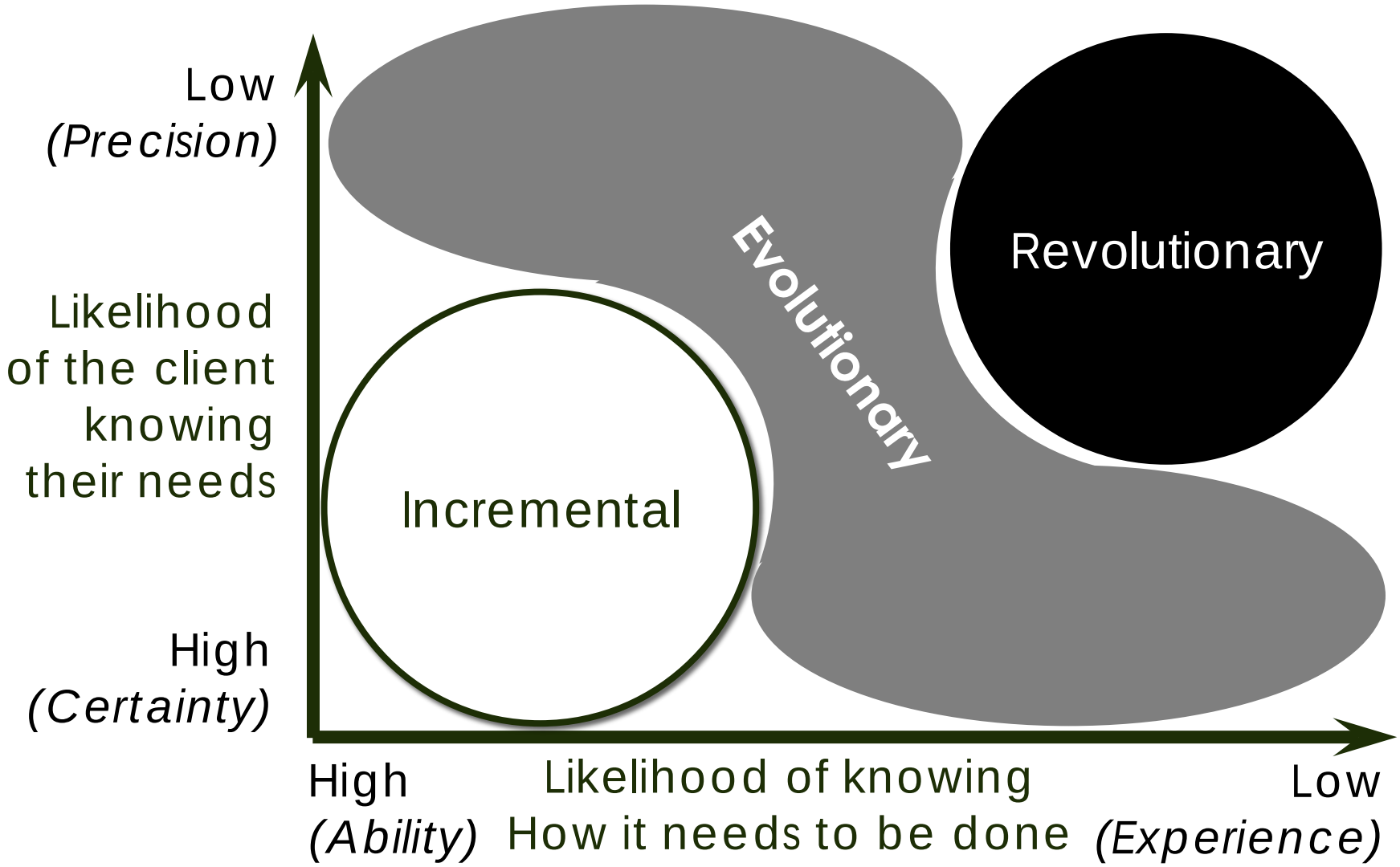
X

Net Fees

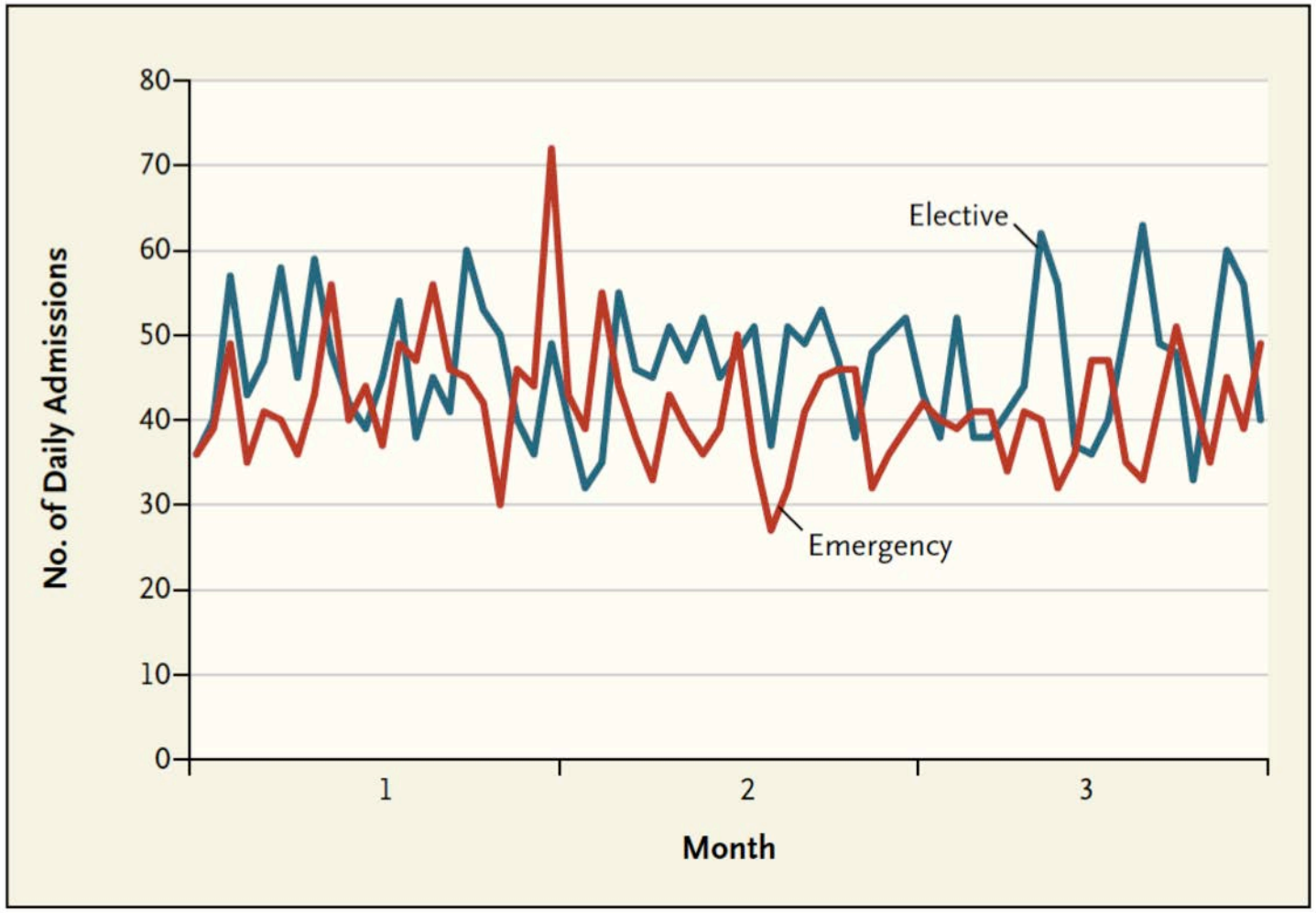
=

- Fees
- No. of hours
- Standardized Services
- Providing predictable value

Why change?


Low
(Precision)
Likelihood
of the client
knowing
their needs
High
(Certainty)
Evolutionary
Revolutionary
Incremental
High
(Ability)
Likelihood of knowing
How it needs to be done
Low
(Experience)

COMPLEXITY IN HEALTHCARE: DAILY ADMITS

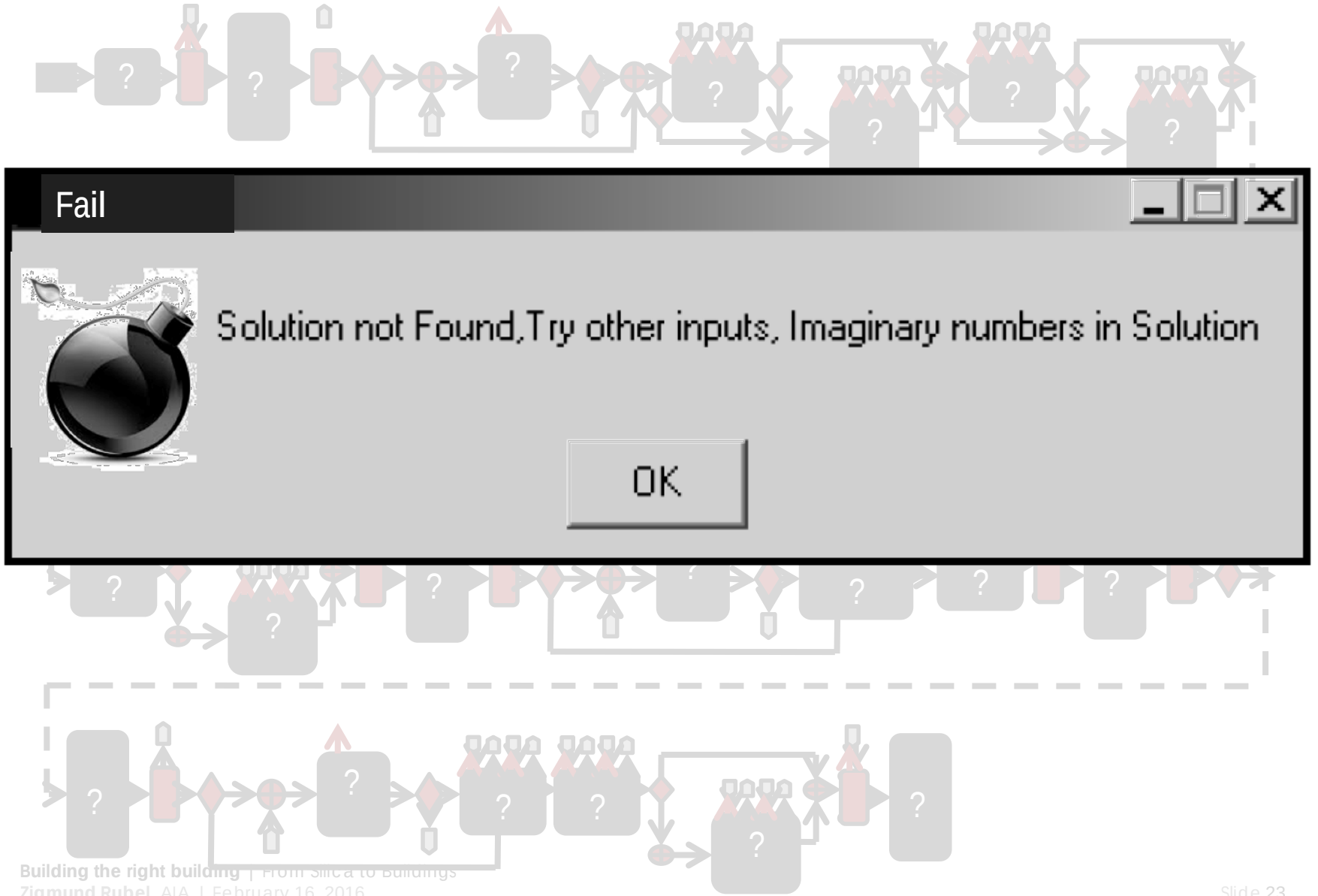


Daily Fluctuations in One Hospital's Admissions for Emergency and Elective Surgery.

Ranges
Surgery: 32 – 62
Emergency: 27 – 72
Totals: 59 – 134

- **New England Journal of Medicine:** Smoothing the Way to High Quality, Safety, and Economy
- Eugene Litvak, Ph.D., and Harvey V. Fineberg, M.D., Ph.D.

Behavioral design intelligence's power



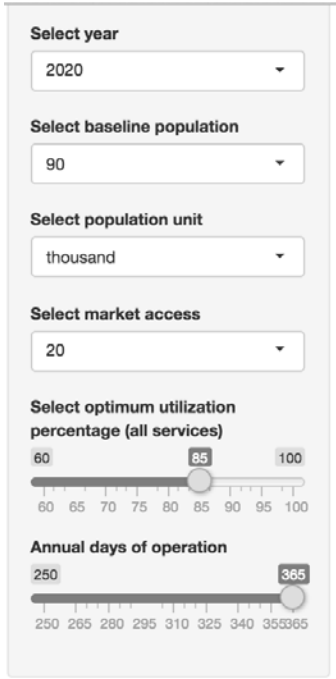
The future business model

Value of services =

- ✦Savings
- ✦Efficiency
- ✦Differentiation


I'm not paying
for your
research
experiment

Population driven design



Scenarios

> ~300 beds | > ~500 beds

Exploration

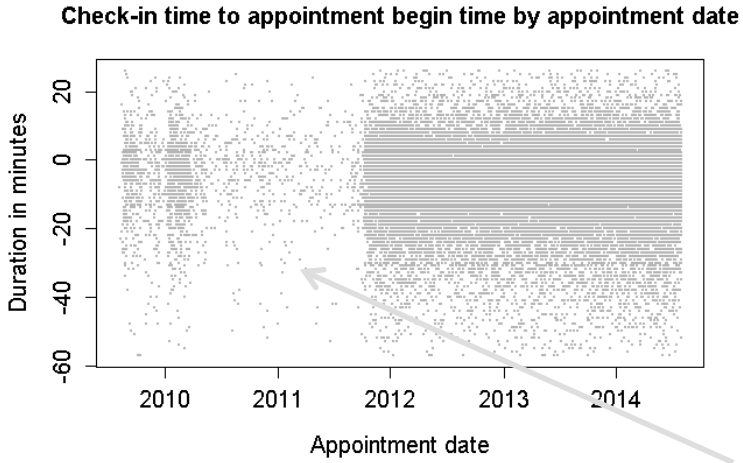
Scenario summary | Socio-Economic Status | Service Lines | Key-drivers | Caseloads | Workflows | Simulation

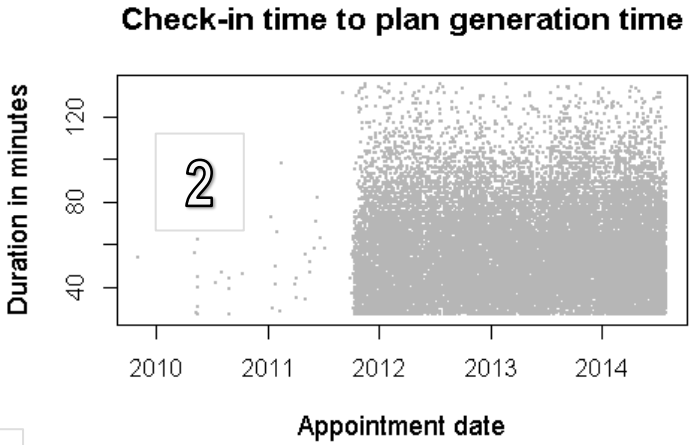
Show 100 entries Search:

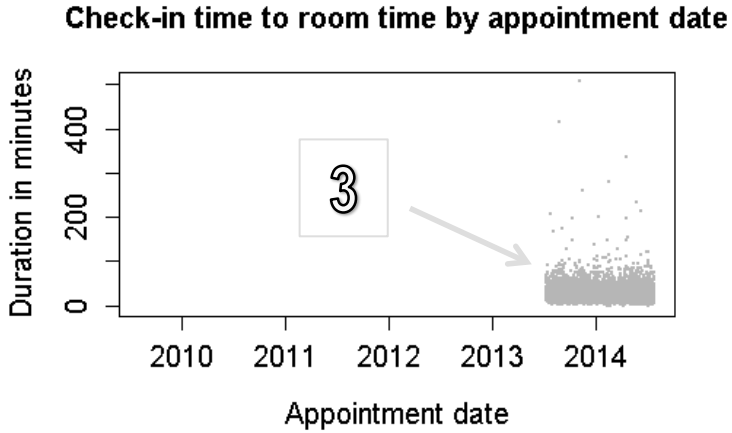
keyDriver	keyDriverUnits
Patient_Beds	103
ICU	29
Emergency_Department_beds	17
Postnatal_room	5
Antenatal_room	4
Outpatient_clinic	2
OR	2
Delivery_room	2
CT	1
Xray	1
MRI	1
Ultrasound	1
Echocardiogram	1
Endoscopy	1
PET	1
Cath_Lab	1
Procedure_outpatient	1

Ischemic heart disease	459
COPD	450
Other non-communicable	388
Diarrheal diseases	386
Lower respiratory infections	370
Child birth	363
Preterm birth complications	355
Tuberculosis	254
Stroke	214
Iron-deficiency anemia	211
Other communicable	207
Neonatal sepsis	206
Low back pain	199
Neonatal encephalopathy	159
Major depressive disorder	153
Other neurological disorders	146
HIV/AIDS	143
Diabetes	137
Hemorrhagic stroke	136
HIV (other)	113
Protein-energy malnutrition	107
Other neonatal disorders	105
Asthma	83
Migraine	83

EMR data driving no. of MD's







1 Inconsistent data between 2010 – 2011.

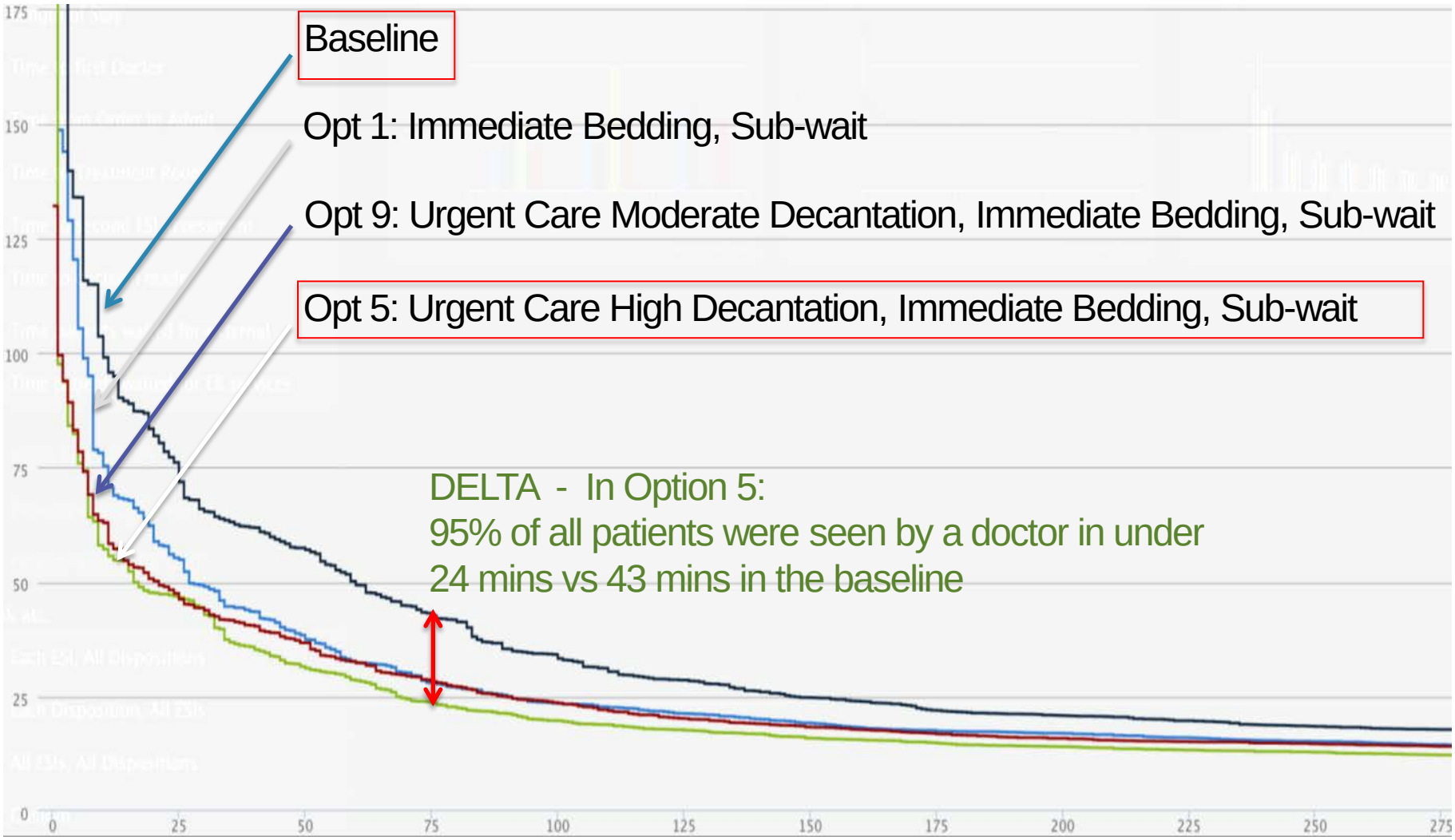
2 Plan generation time was consistently recorded from around October 2011.

3 Room time was recorded starting around July 2013.

Period selected for analysis and model input:

July 2013 to July 2014

UNDERSTANDING TIME TO DOCTOR FOR ALL PATIENTS



BUILDING THE RIGHT BUILDING

Space Program Generator [redacted]

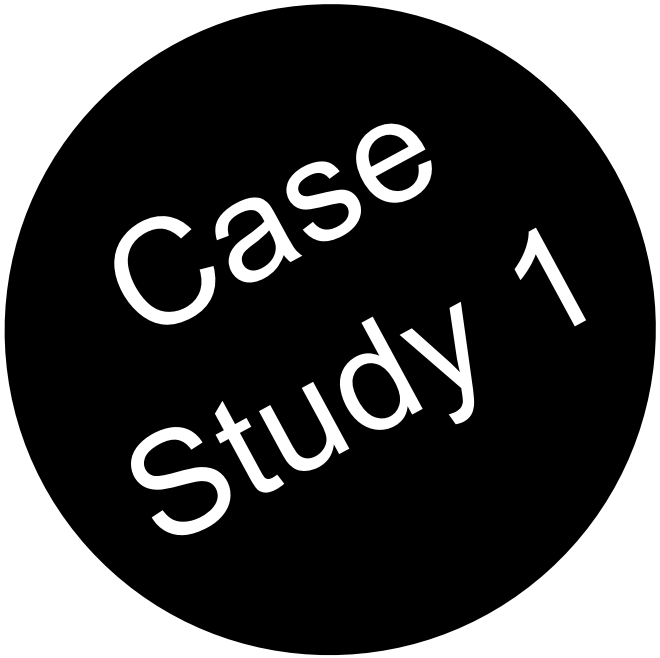
NSF:	14,973	treatment bays:	33	SPG v1
DGSF:	23,209	min bays per pod:	12	
Gen/Fast Pod Qty:	2	max bays per pod:	15	
Hi-Acuity Pod Qty:	1	Distribution mode:	2	
DGSF/driver:	703	Scenario Selection:	4	
		Hospital Beds:	225	

Physical Room Characteristcs

Section Control	Section Name	Room Code	Function Name	Room Functional Description	Allocation Rule	NSF	Placment over-ride	Zone assignment	BM Qty	Allocation Rule Para			Room NSF	QNTY	Prog Area	x	y
On net: 2290 dgsf: 3550 single loaded dblock seed	Admin Areas [next to the chiefs and workstations], chiefs get offices, all	OSHAR	Office, Shared	Template Shared Office with two workstations for case managers, social workers, etc. who primarily consult with patients in the treatment or consultation	1per 2 FTE allocated per Regional Standards for provision of shared or private office, round	110	Yes	5. Dept Support_Admin	6	10%		2	110	3	330	10.00	11.00
		OSHAR	Office, Shared, Assistant Managers/Supervisors	Template Shared Office with two workstations for case managers, social workers, etc. who primarily consult with patients in the treatment or consultation room.	1per 2 FTE allocated per Regional Standards for provision of shared or private office, round	110	Yes	5. Dept Support_Admin	2	5%			110	1	110	10.00	11.00
		OPROV	Office, Provider, Chief	Template designated Provider Office.	1per designated Chief FTE	100	Yes	5. Dept Support_Admin	2	5%			100	2	200	10.00	10.00
		APRFX	Alcove, Printer/Fax/Copier	Locate central to Nurse Station area. Multi-function Printer/ Fax/Copier, additional space for receptacles, paper storage and patient education materials.	1per ED in Staff Office Area	15	Yes	5. Dept Support_Admin	1				15	1	15	6.00	2.50
		OPROV	Office, Provider, Assistant Chief	Template designated Provider Office.	1per forecast FTE allocated per Regional Standards for private Provider Office	100	Yes	5. Dept Support_Admin	2	5%			100	2	200	10.00	10.00
		WAPRO	Work Area, Provider [ris: Private area for physicians.]	Template modular workstation, additional area to access workstations from department gross. Private area for physicians. Locate away from treatment area and	1per forecast FTE allocated per Regional Standards for workstation	55	Yes	5. Dept Support_Admin	5	15%			275	1	275	9.00	6.11
		OGENL	Office, General, Manager	Template Office appropriate for a Manager that meets the Regional requirement for private office space.	1per FTE	100	Yes	5. Dept Support_Admin	3				100	3	300	10.00	10.00
		WACLR	Work Area, Clerical	Template workstation may be assigned to clerical staff or specialty support staff as defined by the department.	1per FTE	55	Yes	5. Dept Support_Admin	12	20%			660	1	660	10.00	5.50
		OGENL	Office, General	Template Office for case managers, social workers, etc. who primarily consult with patients in their	1per FTE meeting regional guidelines for private office, use OSHAR when more than 1 FTE in job class	100	Yes	5. Dept Support_Admin	2	5%			100	2	200	10.00	10.00
On net: 375	Ambulance Vestibule Area	ASTRE	Alcove, Stretcher	Alcove near ambulance entry for spare gurney holding. Include wall protective bumpers and material.	1per 12 rooms, round, minimum 1	25	Yes	3. Treatment Pods_edge	3				75	1	75	6.25	4.00
		WATEC-EMS	Work Area, EMS and Storage	Locate near ambulance entrance.	1per 24 total rooms, round, minimum 1[separate from comm station][can be in the	35	No	3. Treatment Pods_edge	1				0	1	0	8.75	4.00

Case Studies

1 2 3



900-bed Cancer Center Hospital Guangzhou Province, China

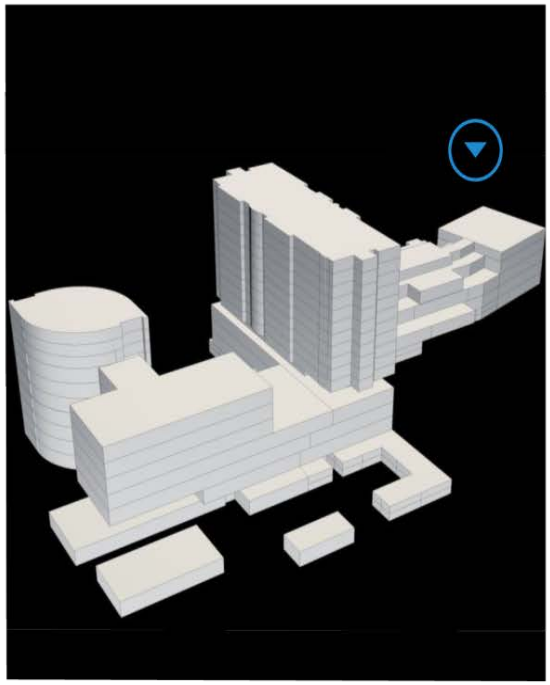
Integrated Business Planning, Space Planning, Architecture and Engineering

Case Study 1:

900 Bed Cancer Center Hospital (China)

Impact of operational efficiency improvements on key driver quantities and building layout – **Surgery and Radiation Oncology Departments on overall Building Scheme**

Department Block Sizing
Surgery & Radiation Oncology



Operational Modeling
Efficiency Increase

Space Program
Generation Live

DGSM 5,896 CAPEX RMB 37.7M Surgery

Standards:			Space Program:
SURG	Department Abbreviation	(Operating Rms, Int. Rad. & MRI)	14
CLINICAL	Functional Group	DGSM (Program)	5,896
40%	Departmental Circulation Factor	Program DGSM (per Driver)	328
15%	Walls and Structure	DGSM (Actual)	

14

Room Code	Room Code	Function Name	NSF	2018 NSM	QNTY	Program Area	Space Program Comments
waiting area		Outpatient Waiting Area (Non-VIPs)	15	1.4	23	32.7	Estimated at early development stage
waiting area		Patient and Family Waiting	467	43.4	1	43.4	Waiting is based upon 20 NSM per person at maximum occupancy
pat toilet		Patient Toilet (female)	140	13.0	2	26.0	ADA compliant; toilet, lavatory, mirror & accessories
pat toilet		Patient Toilet (male)	65	6.0	2	12.0	

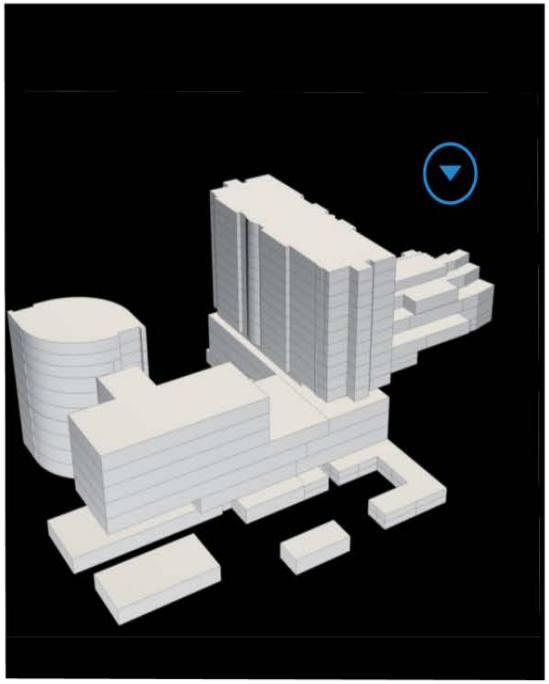
Case Study 1:

900 Bed Cancer Center Hospital (China)

Improvements to both Surgical and Radiation Oncology departments

Space Savings:
29,934 NSM down to 17,824 NSM
CAPEX Savings:
RMB 181.4M down to 110.4M

Department Block Sizing
Surgery & Radiation Oncology



Operational Modeling
Efficiency Increase

Space Program
Generation Live

DGSM 4,919 CAPEX RMB 31.4M Surgery

Standards:			Space Program:
SURG	Department Abbreviation	(Operating Rms, Int. Rad. & MRI)	10
CLINICAL	Functional Group	DGSM (Program)	4,919
40%	Departmental Circulation Factor	Program DGSM (per Driver)	273
15%	Walls and Structure	DGSM (Actual)	

10

Room Code	Function Name	NSF	2018 NSM	QNTY	Program Area	Space Program Comments
waiting area	Outpatient Waiting Area (Non-VIPs)	15	1.4	17	23.4	Estimated at early development stage
waiting area	Patient and Family Waiting	334	31.0	1	31.0	Waiting is based upon 20 NSM per person at maximum occupancy
pat toilet	Patient Toilet (female)	140	13.0	1	13.0	ADA compliant; toilet, lavatory, mirror & accessories
pat toilet	Patient Toilet (male)	65	6.0	1	6.0	

Case Study 2

Emergency Department Optimization
Large US Health Care Network Client

Virtual Simulation and Optimization, Integrated Space Planning

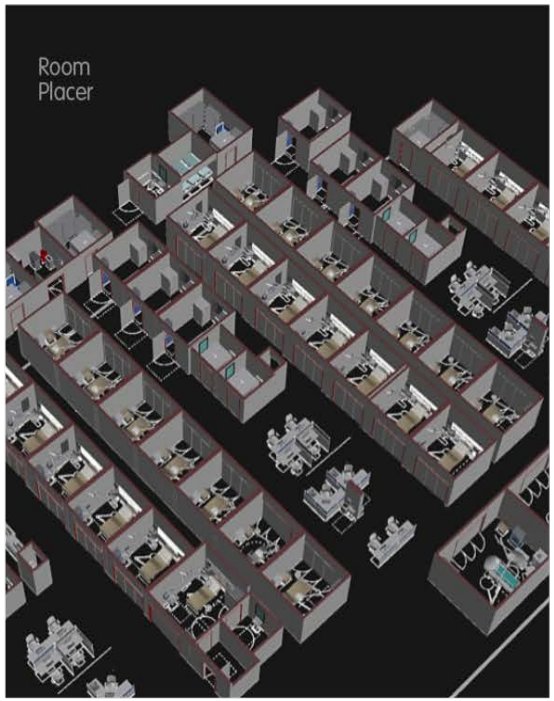
Case Study 2: US Health Care Network Client

Emergency Department Optimization

Resource Optimization Results: Lowest Cost of Ownership

Before:
Traditional sizing methods suggested 45 treatment bays

Department Block Generation
Department Layout



Operational
Modeling Live

Emergency Department Operational Scenarios	UCH Urgent Care High Decantation	UCM Urgent Care Medium Decantation	IB Immediate Bedding	FT Fast Track	SW Sub-Wait Chairs	TCU Transitional Care Unit	Treatment Bays	Sub-Wait Chairs	Nurse FTE	NPV of Differential Life Cycle Cost
Select Options							45	0	96	$325M
Option 3			✓		✓		36	8	72.96	$291M
Option 12	✓		✓		✓	✓	33	4	65.28	$273M
Option 17		✓	✓		✓		35	8	72.96	$290M
Option 19		✓	✓		✓	✓	35	8	72.96	$290M

Space Program
Generation Live

Case Study 2: US Health Care Network Client

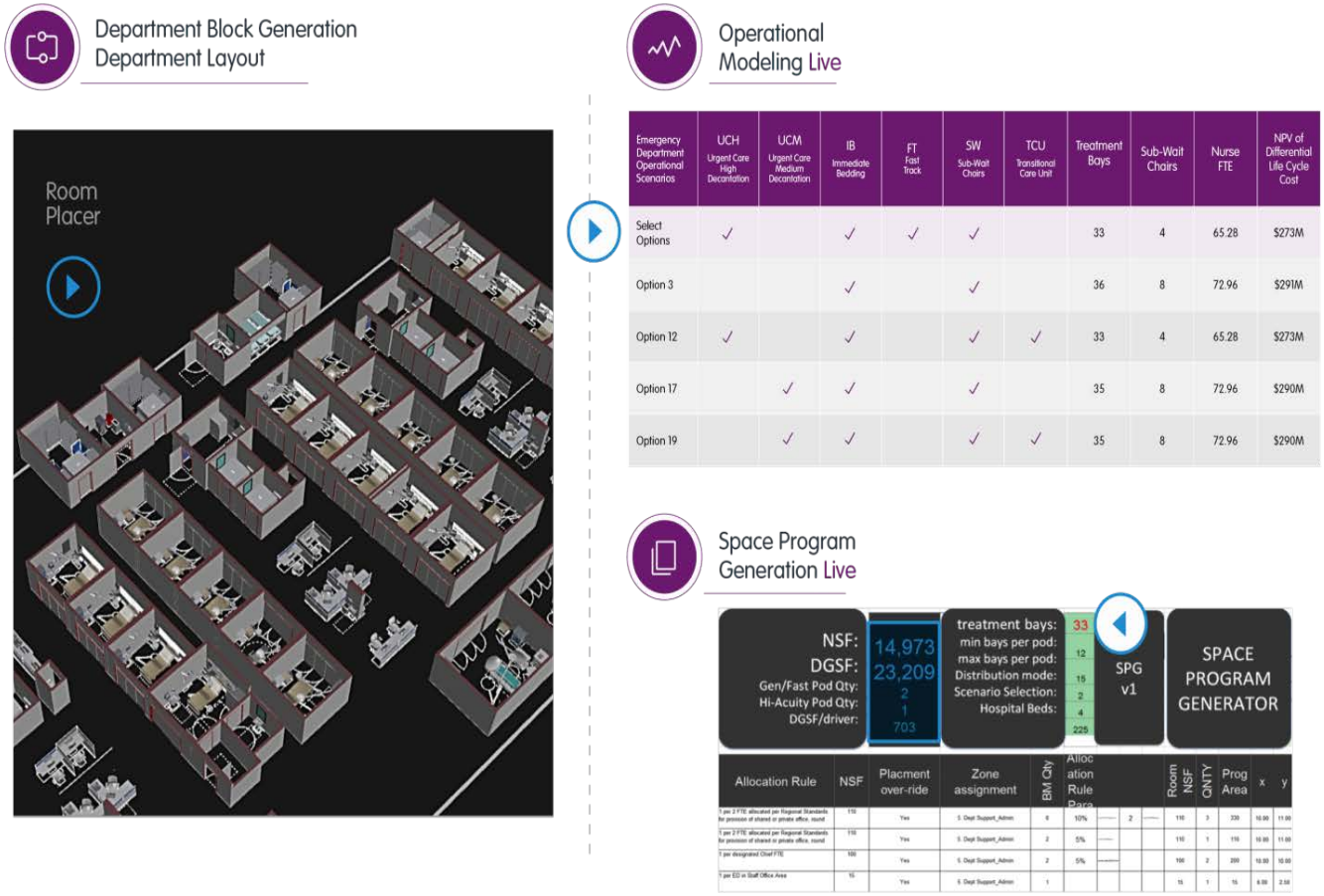
Emergency Department Optimization

Resource Optimization Results: Lowest Cost of Ownership

After:

ARP simulation and optimization reduced treatment bays to 33.

Customer projections of savings using ARP: $22M



Emergency Department Operational Scenarios	UCH Urgent Care High Decantation	UCM Urgent Care Medium Decantation	IB Immediate Bedding	FT Fast Track	SW Sub-Wait Chairs	TCU Transitional Care Unit	Treatment Bays	Sub-Wait Chairs	Nurse FTE	NPV of Differential Life Cycle Cost
Select Options	✓		✓	✓	✓		33	4	65.28	$273M
Option 3			✓		✓		36	8	72.96	$291M
Option 12	✓		✓		✓	✓	33	4	65.28	$273M
Option 17		✓	✓		✓		35	8	72.96	$290M
Option 19		✓	✓		✓	✓	35	8	72.96	$290M

Allocation Rule	NSF	Placment over-ride	Zone assignment	BM Qty	Allocation Rule Para			Room NSF	QNTY	Prog Area	x	y
1 per 2 FTE allocated per Regional Standards for provision of shared or private office, round	110		Yes	5. Dept Support_Admin	0	10%	2	110	3	330	10.00	11.00
1 per 2 FTE allocated per Regional Standards for provision of shared or private office, round	110		Yes	5. Dept Support_Admin	2	5%		110	1	110	10.00	11.00
1 per designated Chief FTE	100		Yes	5. Dept Support_Admin	2	5%		100	2	200	10.00	10.00
1 per ED in Staff Office Area	15		Yes	6. Dept Support_Admin	1			15	1	15	6.00	2.50

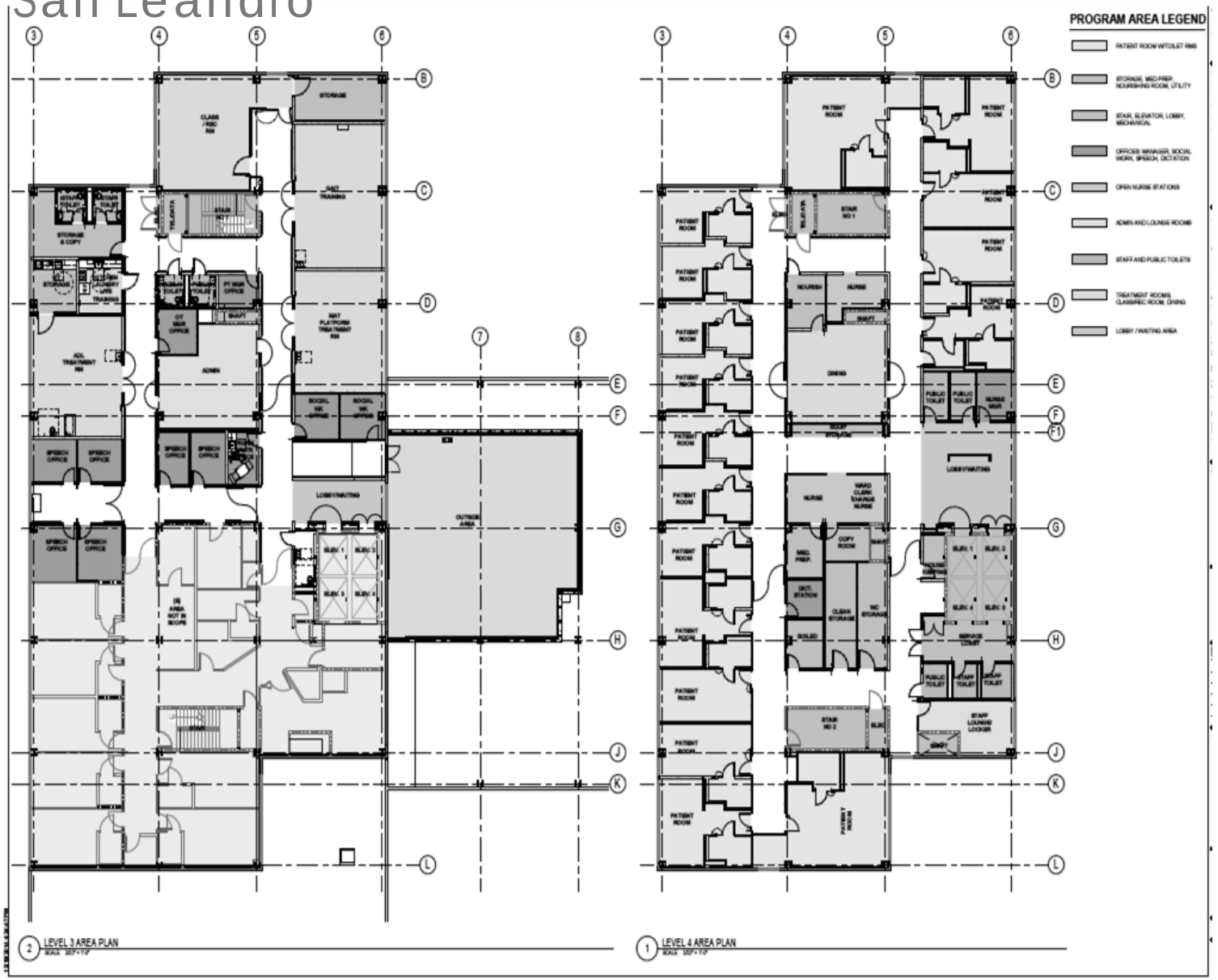
Case Study 3

Health System
San Leandro, CA

Remodel of Existing Acute Care Hospital for SB 90 compliance

Case Study 3: Health System

San Leandro

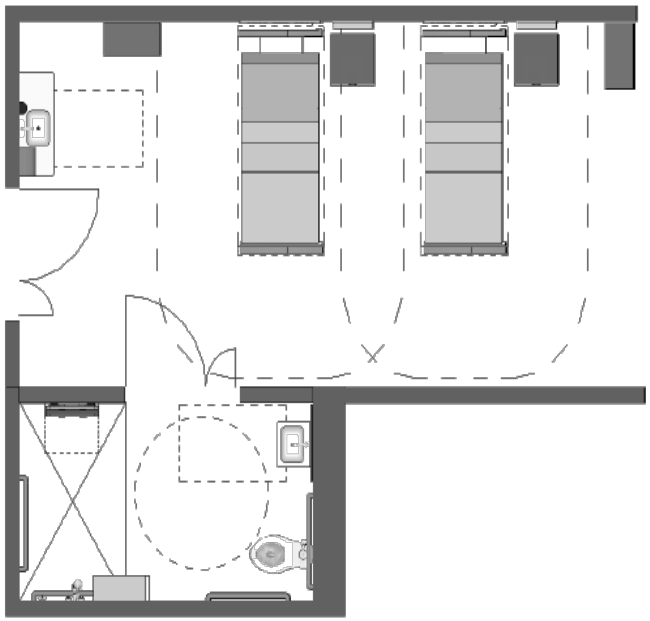


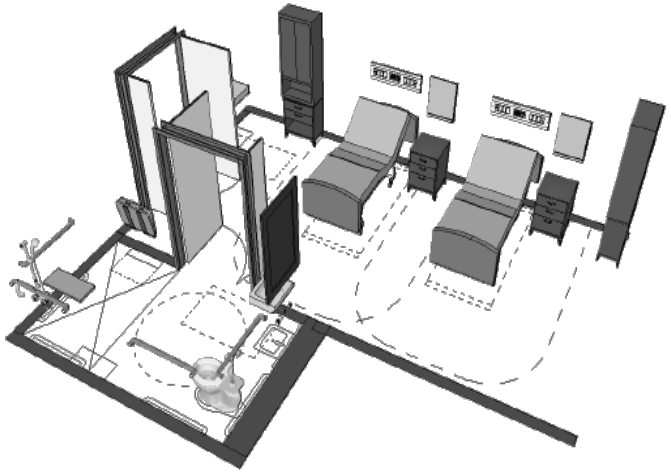
Case Study 3: Health System

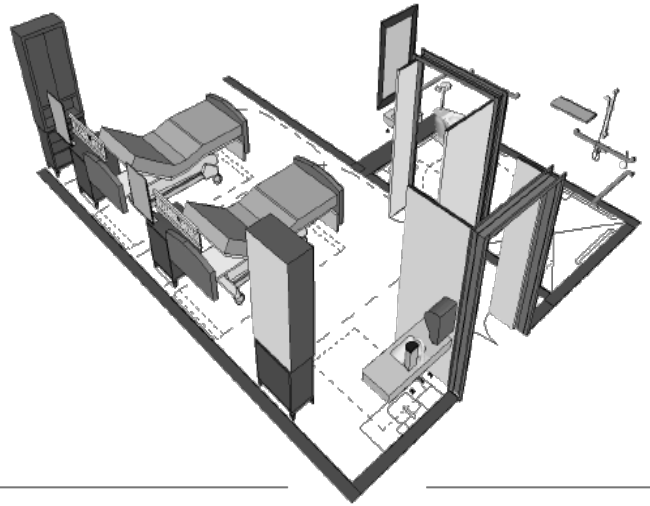
San Leandro

Alameda Health System: San Leandro Hospital Acute Rehab Unit

05: Room Definition Sheets





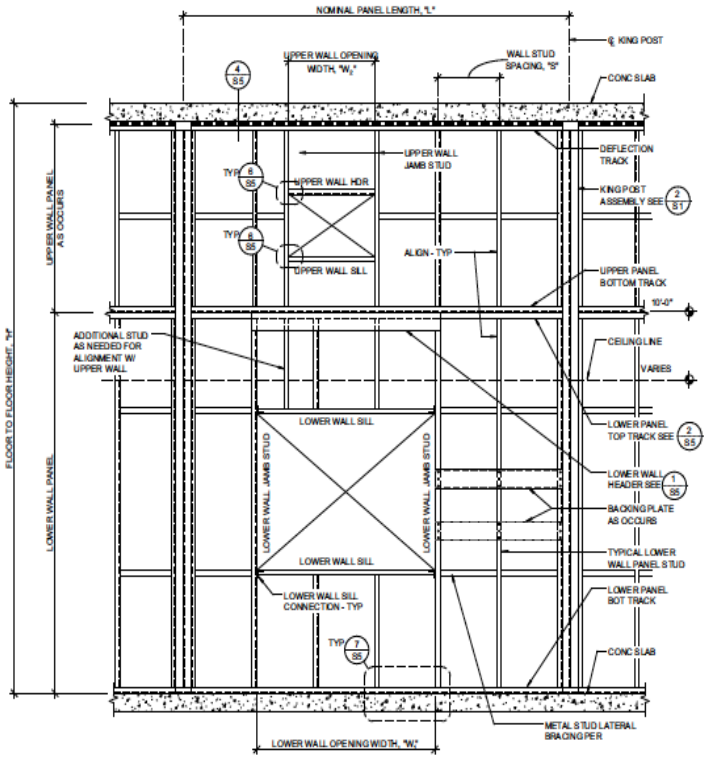


Section:	Room Name:	Proposed Area (NSF):	Floor Assignment:
Rehab / PT	Patient Room Double Side by Side	348	4th Floor

22

Case Study 3: Health System

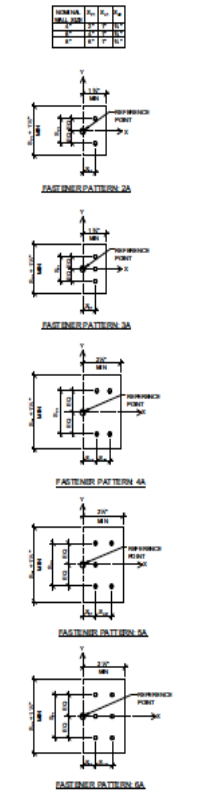
San Leandro



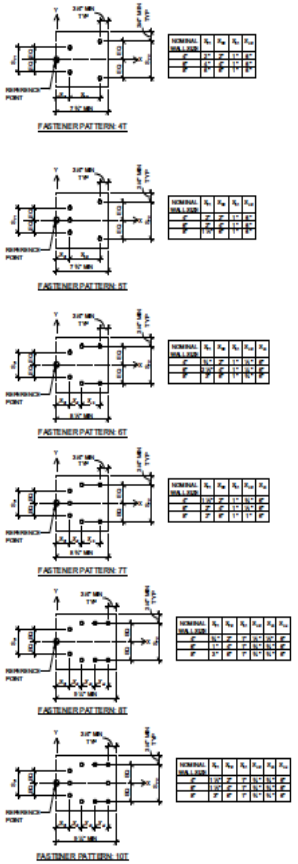
NOTES:

1. THE NON-BEARING PARTITION WALL FRAMING SYSTEM ILLUSTRATED ABOVE CONSISTS OF PRE-FABRICATED UPPER AND LOWER WALL PANELS THAT SPAN HORIZONTALLY BETWEEN FULL HEIGHT KING POSTS.
2. THE WALL FRAMING COMPONENTS ARE INTENDED TO BE INSTALLED IN THE FOLLOWING ORDER:
   A. KING POST BASE CONNECTIONS
   B. KING POST TOP CONNECTIONS
   C. DEFLECTION TRACKS AT CEILING
   D. UPPER WALL PANELS
   E. LOWER WALL PANELS
3. FOR USE AT INTERIOR, NON-LOAD BEARING PARTITION WALLS ONLY
4. WALL STUD BRIDGING/BLOCKING REQUIRED PER 3/S5.

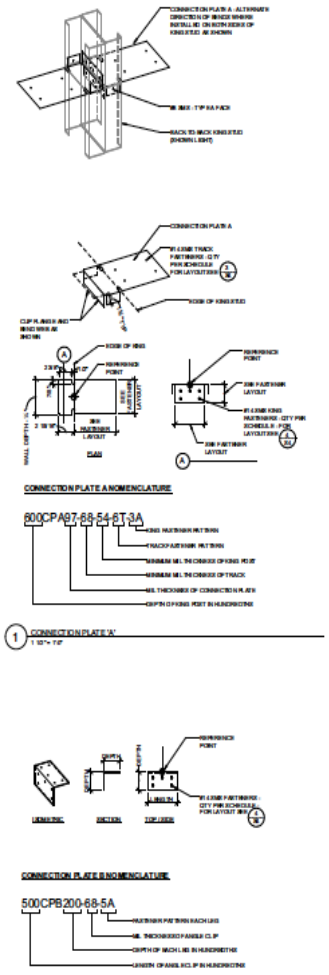
1 TYPICAL WALL ELEVATION
1/2" = 1'-0"



4 KING FASTENER PATTERNS



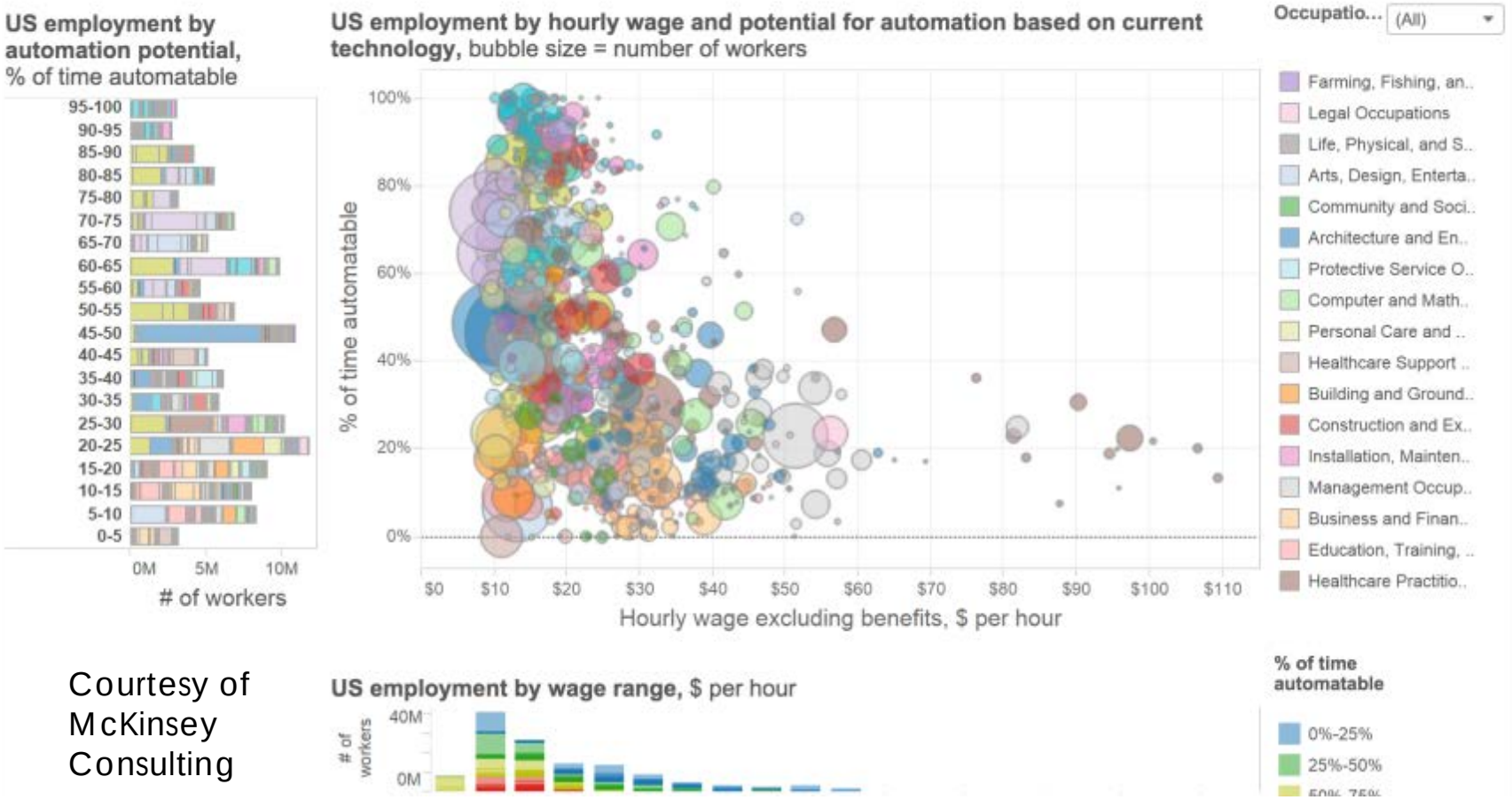
3 TRACK FASTENER PATTERNS



Final Thoughts

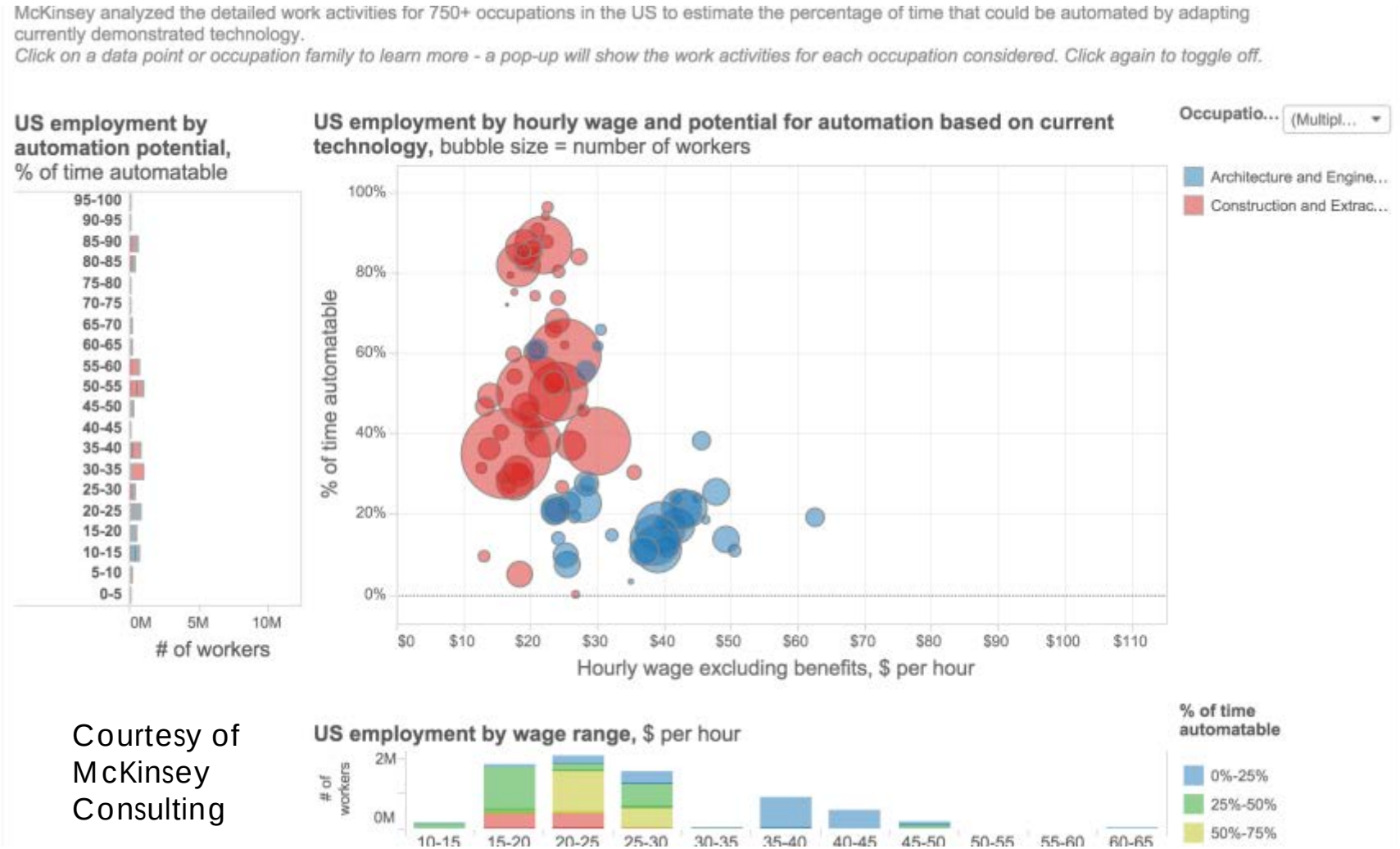
Impacts of Automation to Jobs

McKinsey analyzed the detailed work activities for 750+ occupations in the US to estimate the percentage of time that could be automated by adapting currently demonstrated technology.
Click on a data point or occupation family to learn more - a pop-up will show the work activities for each occupation considered. Click again to toggle off.



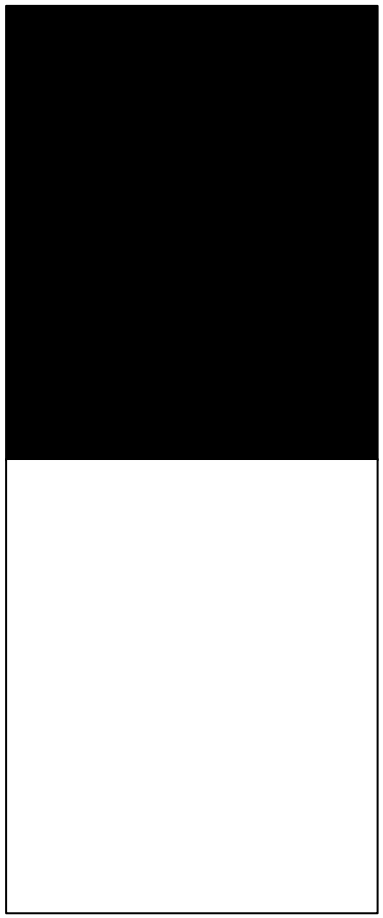
Courtesy of McKinsey Consulting

Impacts in AEC

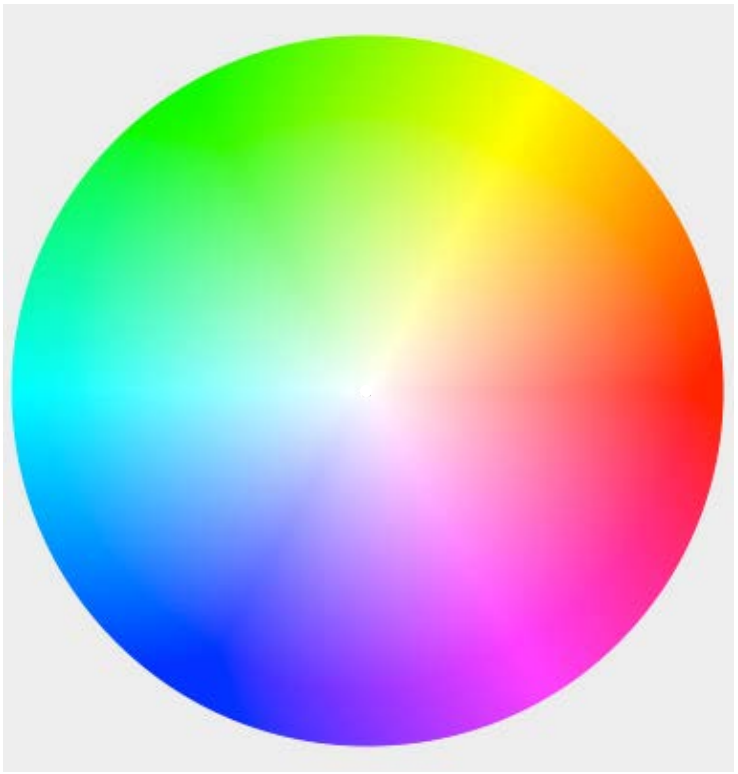


Courtesy of McKinsey Consulting

Why Has This Not Happened Yet?



VS.



Think Hybrid

Think different
Business Model

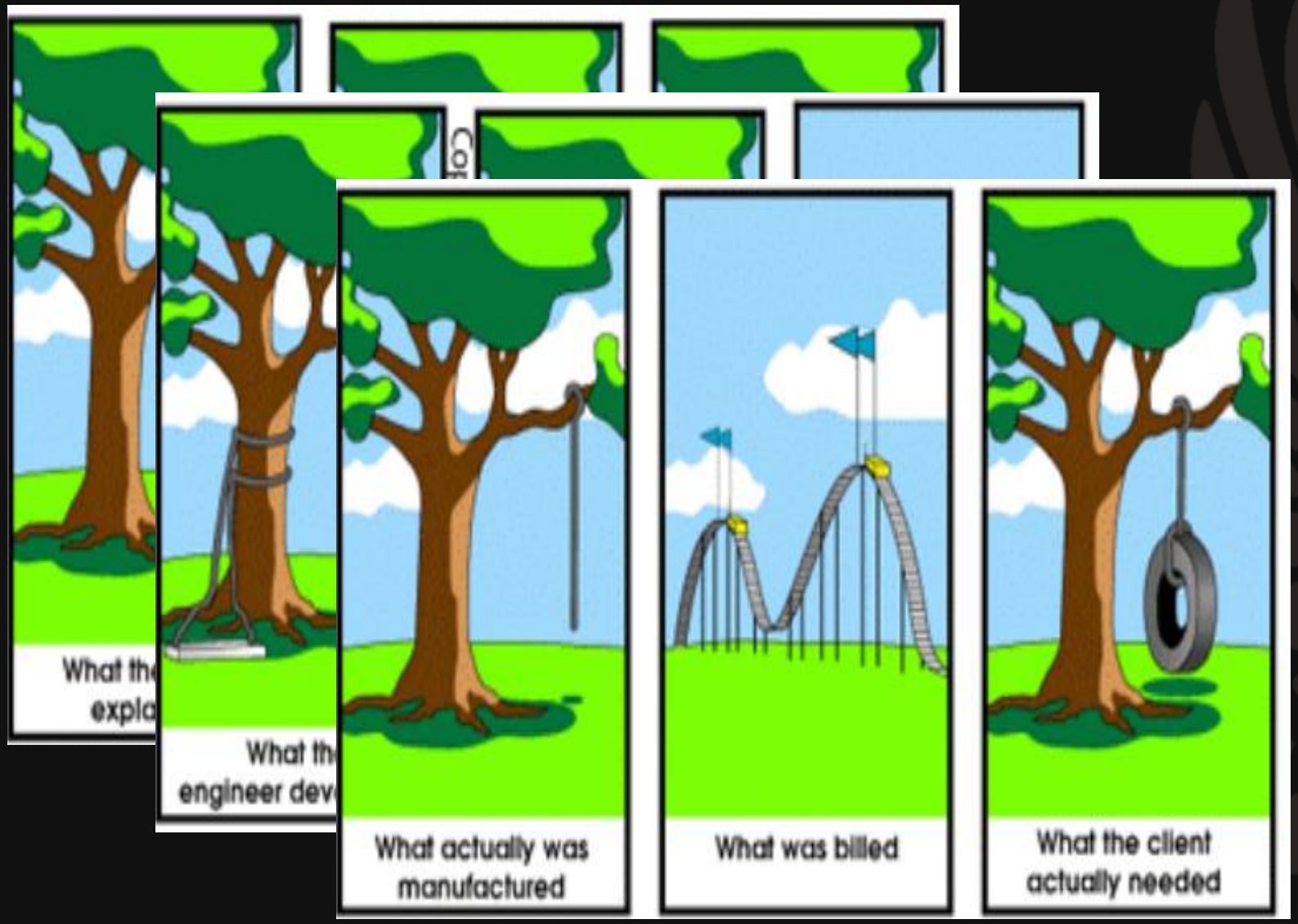
Thank you!

Conceptual + Model Based Estimating

Collaborating + Profiler

Stewart Carroll, Beck Technology
Jeff Ratcliff, Beck Group

Budgeting Process - Traditional



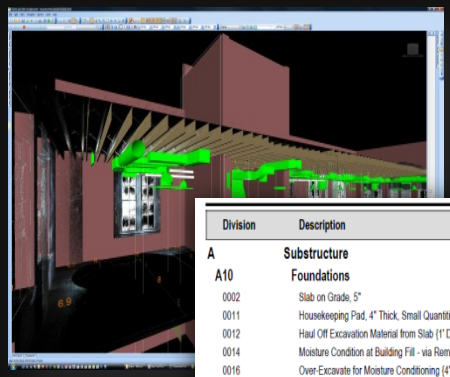
Budgeting Process – Target Value Design

What are we trying to do differently?

- Make early decisions prior to utilizing valuable design hours
- Aligning design intent with the budget
- Communicate design options to allow the owners to make informed decisions
- Align design and preconstruction to ensure we are rowing our boat in the same direction.

About Beck Technology

	Current View	Variance vs. Base
Substructure	$459,462	$0
Shell	$7,620,206	$86,348
Interiors	$5,152,351	$127,920
Services	$15,479,798	$0
Equipment and furnishings	$1,056,779	$0
Special Construction and demolition	$1,138,011	-$9,100
Building Sitework	$618,209	$0
General Conditions	$1,582,870	$0
Escalation Contengency	$43,530	$16,641
Construction Contengency	$74,700	$6,133
Permits/Insurance/Bonds	$686,614	$7,919
Fee	$583,439	$2,576
Subtotal	$34,495,969	$238,446
Market Escalation Factor	$967,103	$0
CM Contingency	$780,194	$0
Total Probable Construction Cost	**$37,123,266**	**$238,446**

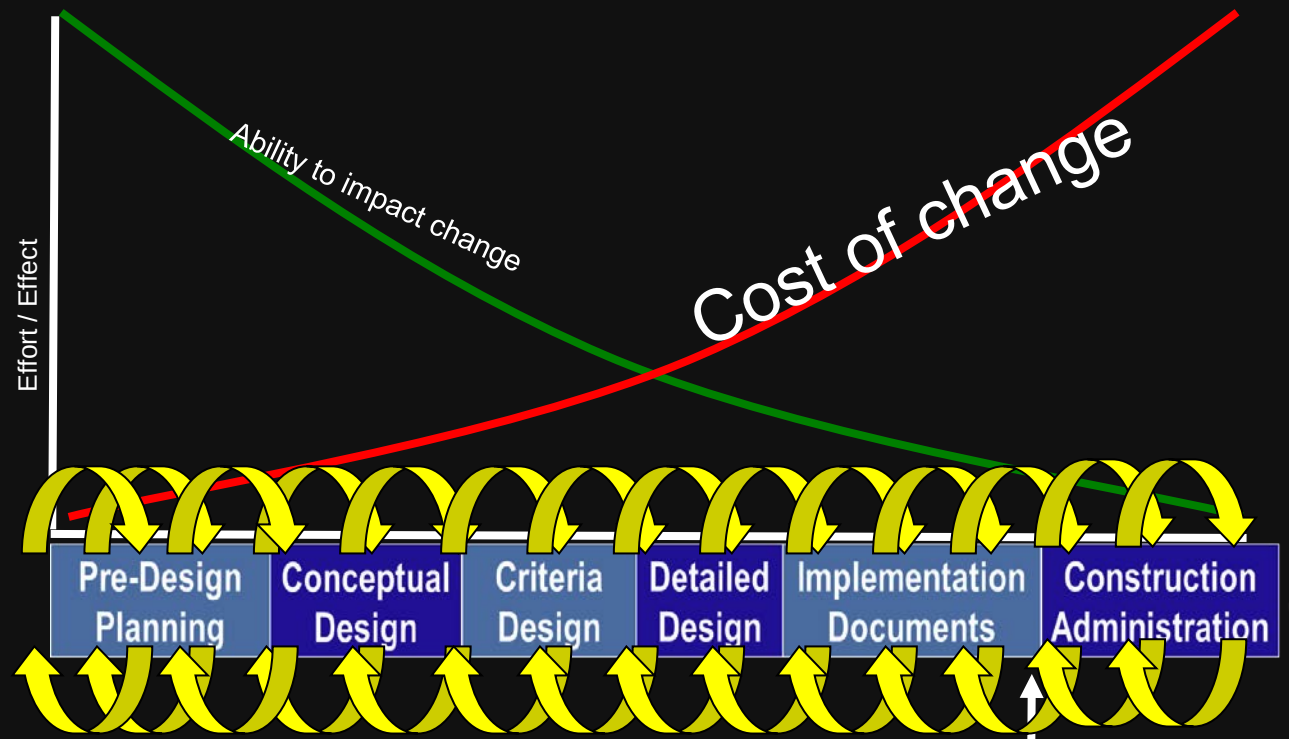


Division	Description	Quantity	Unit	Unit Price	Cost	Cost / Area
A	Substructure					
A10	Foundations					
0002	Slab on Grade, 5"	41,362.28	S.F.	$6.88	$284,365.68	$6.74
0011	Housekeeping Pad, 4" Thick, Small Quantities	316.59	S.F.	$7.50	$2,374.44	$0.06
0012	Haul Off Excavation Material from Slab (1' Depth)	1,563.42	C.Y.	$10.00	$15,634.18	$0.37
0014	Moisture Condition at Building Fill - via Remove / Replace (3' Depth)	4,690.25	C.Y.	$9.38	$43,971.13	$1.04
0016	Over-Excavate for Moisture Conditioning (4' Depth)	6,253.67	C.Y.	$6.88	$42,993.99	$1.02
0018	Vapor Barrier, Slab on Grade, Stego Wrap or Similar	44,322.89	S.F.	$0.48	$21,053.38	$0.50
0019	Fine Grade, Slab	42,212.28	S.F.	$0.63	$26,382.68	$0.63
0020	Termite Pre-Treatment at Building Slab	44,322.89	S.F.	$0.25	$11,080.72	$0.26
0023	Continuous Spread Footing, 36"x24" (Exc, Form, Pour, Backfill)	1,130.64	L.F.	$125.00	$141,329.77	$3.35
0024	Subsoil Drainage Piping, 4"	1,130.64	L.F.	$10.25	$11,589.04	$0.27
0027	Spot Footing, 36"x36"x18" (Exc, Form, Pour, Backfill)	47.00	Ea.	$706.25	$33,193.75	$0.79

Conceptual Phase | Schematic Phase | Design Development | Construction Documents | Construction Phase

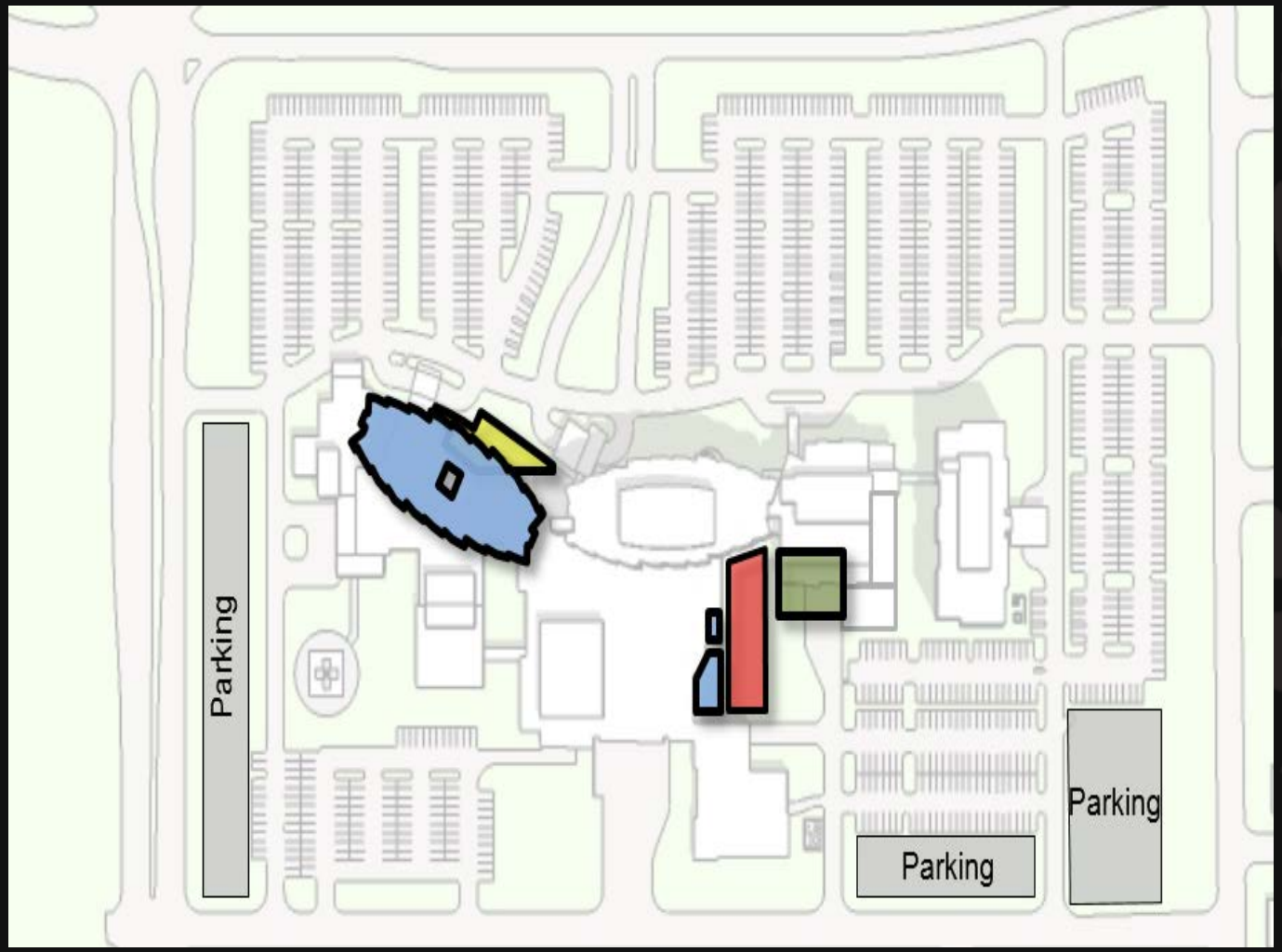
DESTINI PROFILER → DESTINI ESTIMATOR

Technology Tool – DProfiler



Budgeting Process – Target Value Design

The Program / Idea

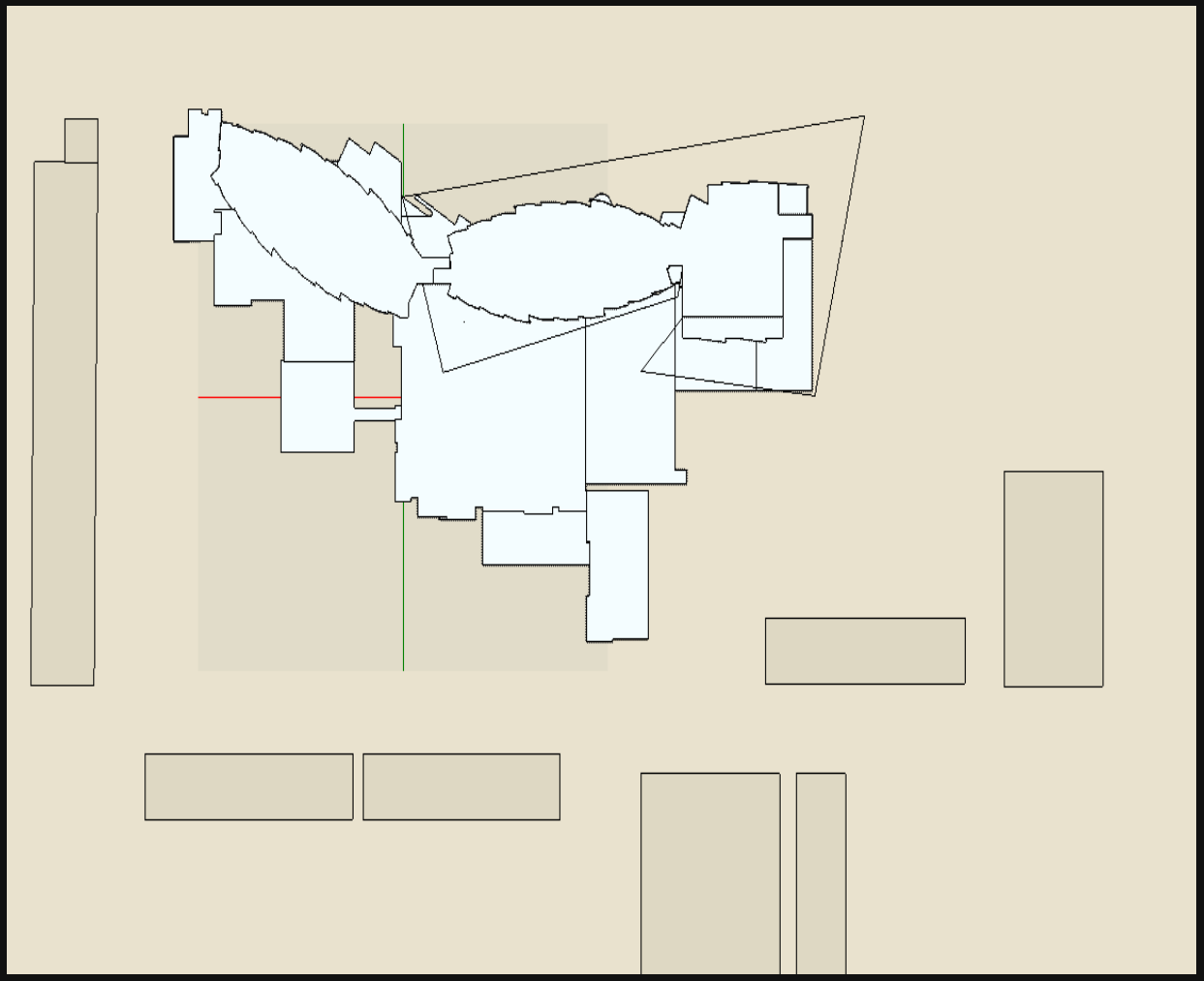


Budgeting Process – Target Value Design

Engagement / Communicate

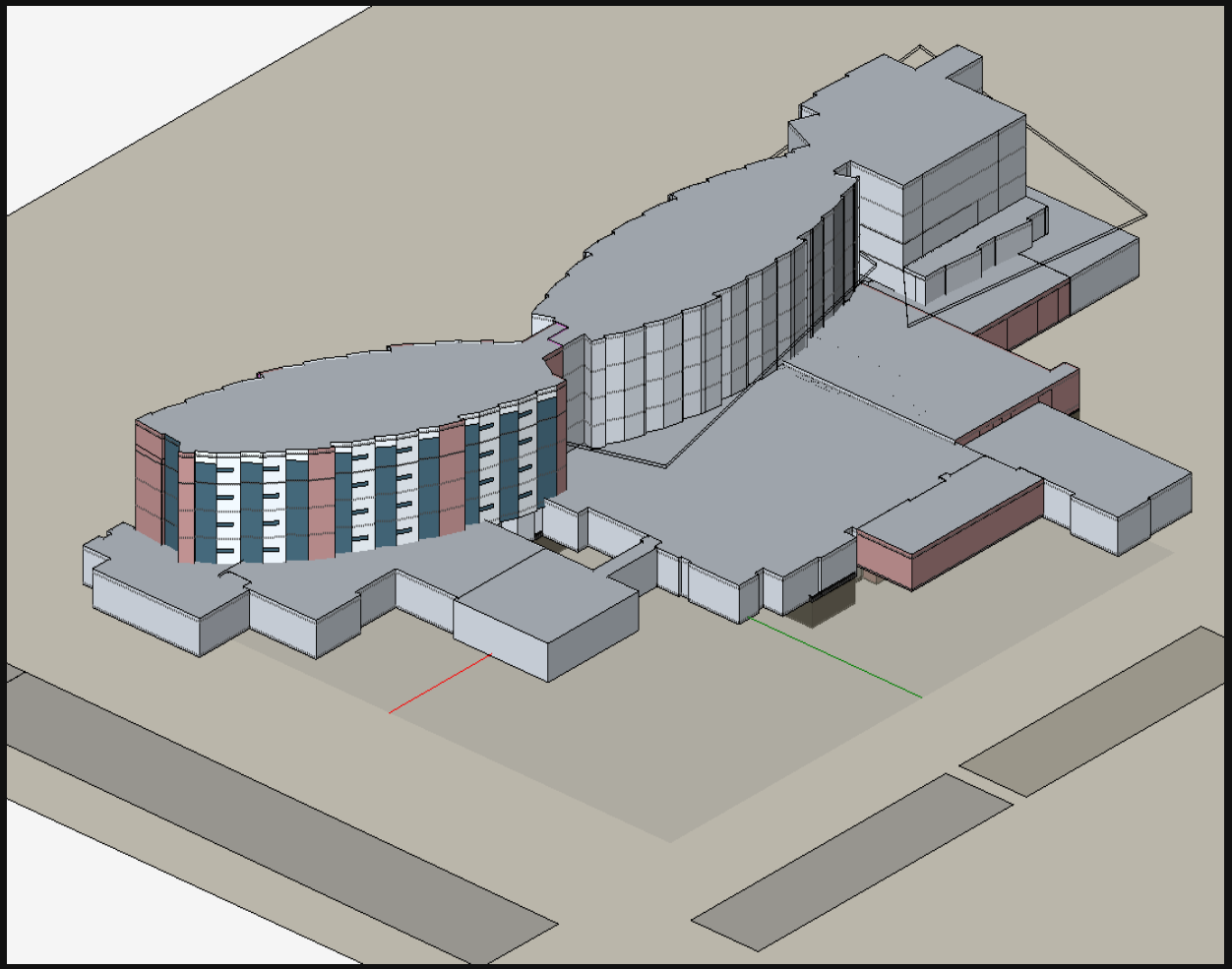
Budgeting Process

Model the Program



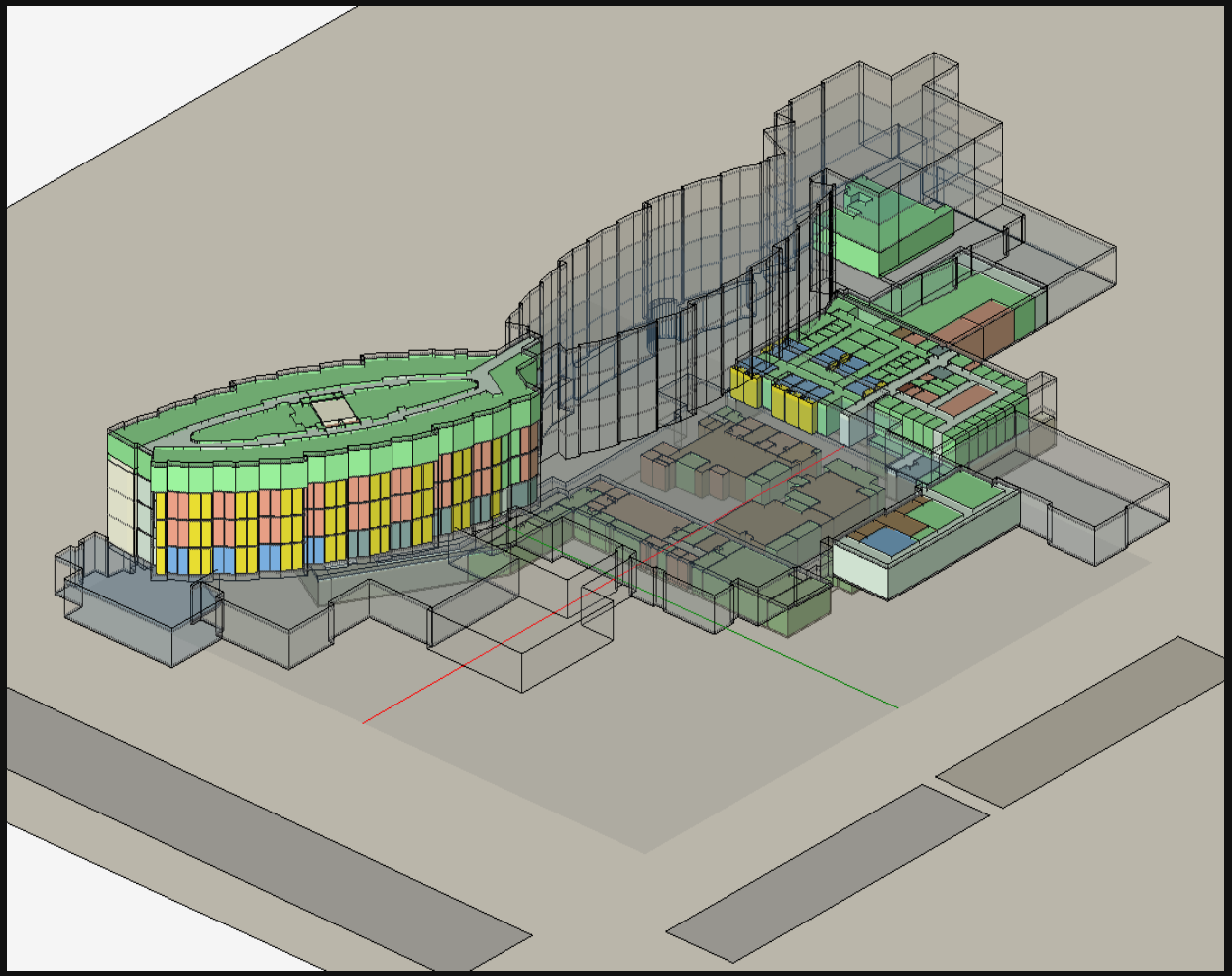
Budgeting Process

Model the Program



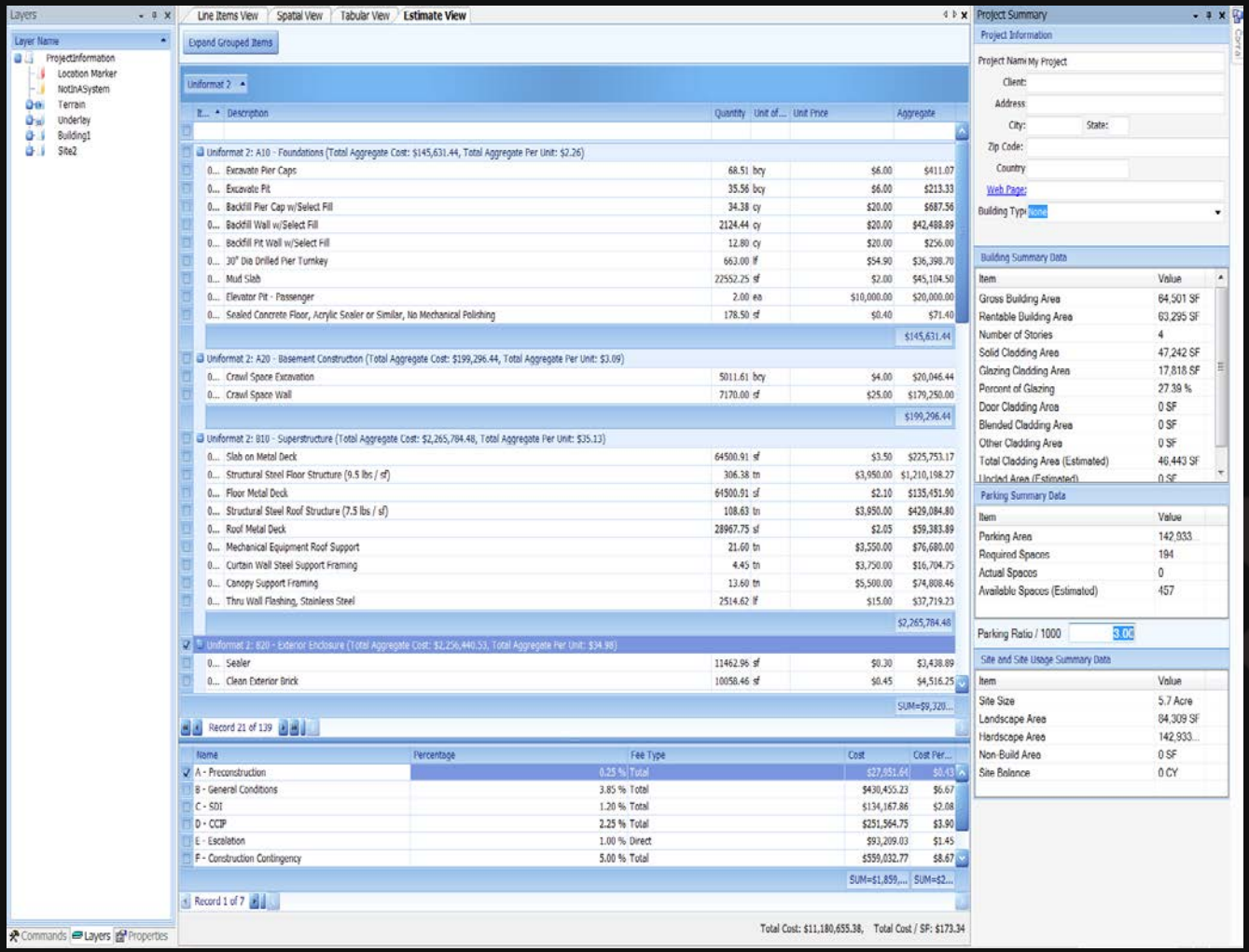
Budgeting Process

Model the Program



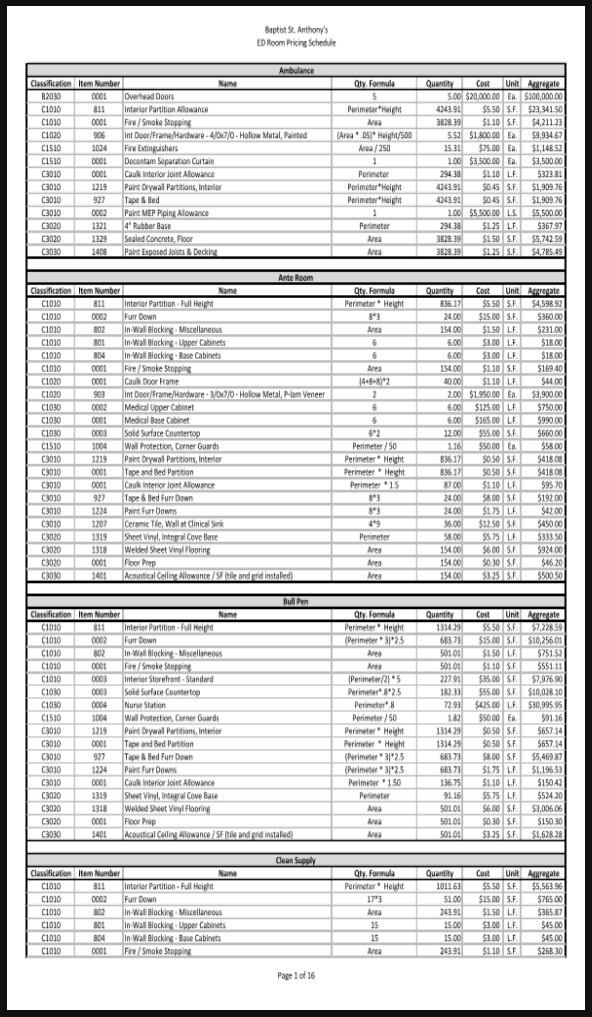
Budgeting Process

Data Within the Model



Budgeting Process

Estimate Supporting Data



Baptist St. Anthony's
ED Room Pricing Schedule

Ambulance

Classification	Item Number	Name	Qty. Formula	Quantity	Cost	Unit	Aggregate
B2030	0001	Overhead Doors	5	5.00	$20,000.00	Ea.	$100,000.00
C1010	811	Interior Partition Allowance	Perimeter*Height	4243.91	$5.50	S.F.	$23,341.50
C1010	0001	Fire / Smoke Stopping	Area	3828.39	$1.10	S.F.	$4,211.23
C1020	906	Int Door/Frame/Hardware - 4/0x7/0 - Hollow Metal, Painted	(Area * .05)* Height/500	5.52	$1,800.00	Ea.	$9,934.67
C1510	1024	Fire Extinguishers	Area / 250	15.31	$75.00	Ea.	$1,148.52
C1510	0001	Docontam Separation Curtain	1	1.00	$3,500.00	Ea.	$3,500.00
C3010	0001	Caulk Interior Joint Allowance	Perimeter	294.38	$1.10	L.F.	$323.81
C3010	1219	Paint Drywall Partitions, Interior	Perimeter*Height	4243.91	$0.45	S.F.	$1,909.76
C3010	927	Tape & Bed	Perimeter*Height	4243.91	$0.45	S.F.	$1,909.76
C3010	0002	Paint MEP Piping Allowance	1	1.00	$5,500.00	L.S.	$5,500.00
C3020	1321	4" Rubber Base	Perimeter	294.38	$1.25	L.F.	$367.97
C3020	1329	Sealed Concrete, Floor	Area	3828.39	$1.50	S.F.	$5,742.59
C3030	1408	Paint Exposed Joists & Decking	Area	3828.39	$1.25	S.F.	$4,785.49

Ante Room

Classification	Item Number	Name	Qty. Formula	Quantity	Cost	Unit	Aggregate
C1010	811	Interior Partition - Full Height	Perimeter * Height	836.17	$5.50	S.F.	$4,598.92
C1010	0002	Furr Down	8*3	24.00	$15.00	S.F.	$360.00
C1010	802	In-Wall Blocking - Miscellaneous	Area	154.00	$1.50	L.F.	$231.00
C1010	801	In-Wall Blocking - Upper Cabinets	6	6.00	$3.00	L.F.	$18.00
C1010	804	In-Wall Blocking - Base Cabinets	6	6.00	$3.00	L.F.	$18.00
C1010	0001	Fire / Smoke Stopping	Area	154.00	$1.10	S.F.	$169.40
C1020	0001	Caulk Door Frame	(4+8+8)*2	40.00	$1.10	L.F.	$44.00
C1020	903	Int Door/Frame/Hardware - 3/0x7/0 - Hollow Metal, P-lam Veneer	2	2.00	$1,950.00	Ea.	$3,900.00
C1030	0002	Medical Upper Cabinet	6	6.00	$125.00	L.F.	$750.00
C1030	0001	Medical Base Cabinet	6	6.00	$165.00	L.F.	$990.00
C1030	0003	Solid Surface Countertop	6*2	12.00	$55.00	S.F.	$660.00
C1510	1004	Wall Protection, Corner Guards	Perimeter / 50	1.16	$50.00	Ea.	$58.00
C3010	1219	Paint Drywall Partitions, Interior	Perimeter * Height	836.17	$0.50	S.F.	$418.08
C3010	0001	Tape and Bed Partition	Perimeter * Height	836.17	$0.50	S.F.	$418.08
C3010	0001	Caulk Interior Joint Allowance	Perimeter * 1.5	87.00	$1.10	L.F.	$95.70
C3010	927	Tape & Bed Furr Down	8*3	24.00	$8.00	S.F.	$192.00
C3010	1224	Paint Furr Downs	8*3	24.00	$1.75	L.F.	$42.00
C3010	1207	Ceramic Tile, Wall at Clinical Sink	4*9	36.00	$12.50	S.F.	$450.00
C3020	1319	Sheet Vinyl, Integral Cove Base	Perimeter	58.00	$5.75	L.F.	$333.50
C3020	1318	Welded Sheet Vinyl Flooring	Area	154.00	$6.00	S.F.	$924.00
C3020	0001	Floor Prep	Area	154.00	$0.30	S.F.	$46.20
C3030	1401	Acoustical Ceiling Allowance / SF (tile and grid installed)	Area	154.00	$3.25	S.F.	$500.50

Bull Pen

Classification	Item Number	Name	Qty. Formula	Quantity	Cost	Unit	Aggregate
C1010	811	Interior Partition - Full Height	Perimeter * Height	1314.29	$5.50	S.F.	$7,228.59
C1010	0002	Furr Down	(Perimeter * 3)*2.5	683.73	$15.00	S.F.	$10,256.01
C1010	802	In-Wall Blocking - Miscellaneous	Area	501.01	$1.50	L.F.	$751.52
C1010	0001	Fire / Smoke Stopping	Area	501.01	$1.10	S.F.	$551.11
C1010	0003	Interior Storefront - Standard	(Perimeter/2) * 5	227.91	$35.00	S.F.	$7,976.90
C1030	0003	Solid Surface Countertop	Perimeter* 8*2.5	182.33	$55.00	S.F.	$10,028.10
C1030	0004	Nurse Station	Perimeter* 8	72.93	$425.00	L.F.	$30,995.95
C1510	1004	Wall Protection, Corner Guards	Perimeter / 50	1.82	$50.00	Ea.	$91.16
C3010	1219	Paint Drywall Partitions, Interior	Perimeter * Height	1314.29	$0.50	S.F.	$657.14
C3010	0001	Tape and Bed Partition	Perimeter * Height	1314.29	$0.50	S.F.	$657.14
C3010	927	Tape & Bed Furr Down	(Perimeter * 3)*2.5	683.73	$8.00	S.F.	$5,469.87
C3010	1224	Paint Furr Downs	(Perimeter * 3)*2.5	683.73	$1.75	L.F.	$1,196.53
C3010	0001	Caulk Interior Joint Allowance	Perimeter * 1.50	136.75	$1.10	L.F.	$150.42
C3020	1319	Sheet Vinyl, Integral Cove Base	Perimeter	91.16	$5.75	L.F.	$524.20
C3020	1318	Welded Sheet Vinyl Flooring	Area	501.01	$6.00	S.F.	$3,006.06
C3020	0001	Floor Prep	Area	501.01	$0.30	S.F.	$150.30
C3030	1401	Acoustical Ceiling Allowance / SF (tile and grid installed)	Area	501.01	$3.25	S.F.	$1,628.28

Clean Supply

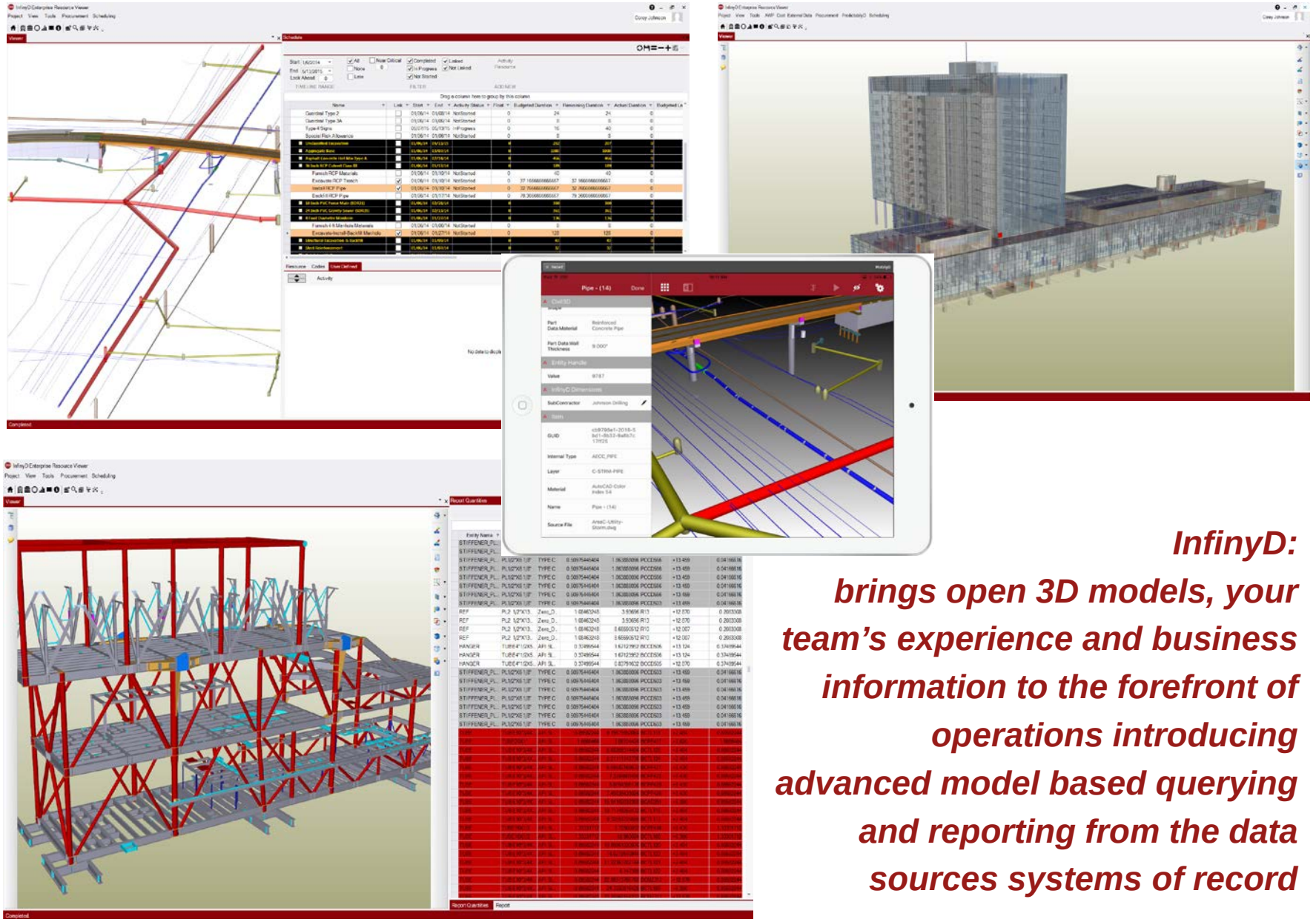
Classification	Item Number	Name	Qty. Formula	Quantity	Cost	Unit	Aggregate
C1010	811	Interior Partition - Full Height	Perimeter * Height	1011.63	$5.50	S.F.	$5,563.96
C1010	0002	Furr Down	17*3	51.00	$15.00	S.F.	$765.00
C1010	802	In-Wall Blocking - Miscellaneous	Area	243.91	$1.50	L.F.	$365.87
C1010	801	In-Wall Blocking - Upper Cabinets	15	15.00	$3.00	L.F.	$45.00
C1010	804	In-Wall Blocking - Base Cabinets	15	15.00	$3.00	L.F.	$45.00
C1010	0001	Fire / Smoke Stopping	Area	243.91	$1.10	S.F.	$268.30

Page 1 of 16

- **Communicate Assumptions**
  - This tool helps inform other team members that were not involved in the earlier stages.
- **Data Separated by Rooms**
  - In a format that communicates to field construction staff to what they are buying (bid tab format)

InfinyD

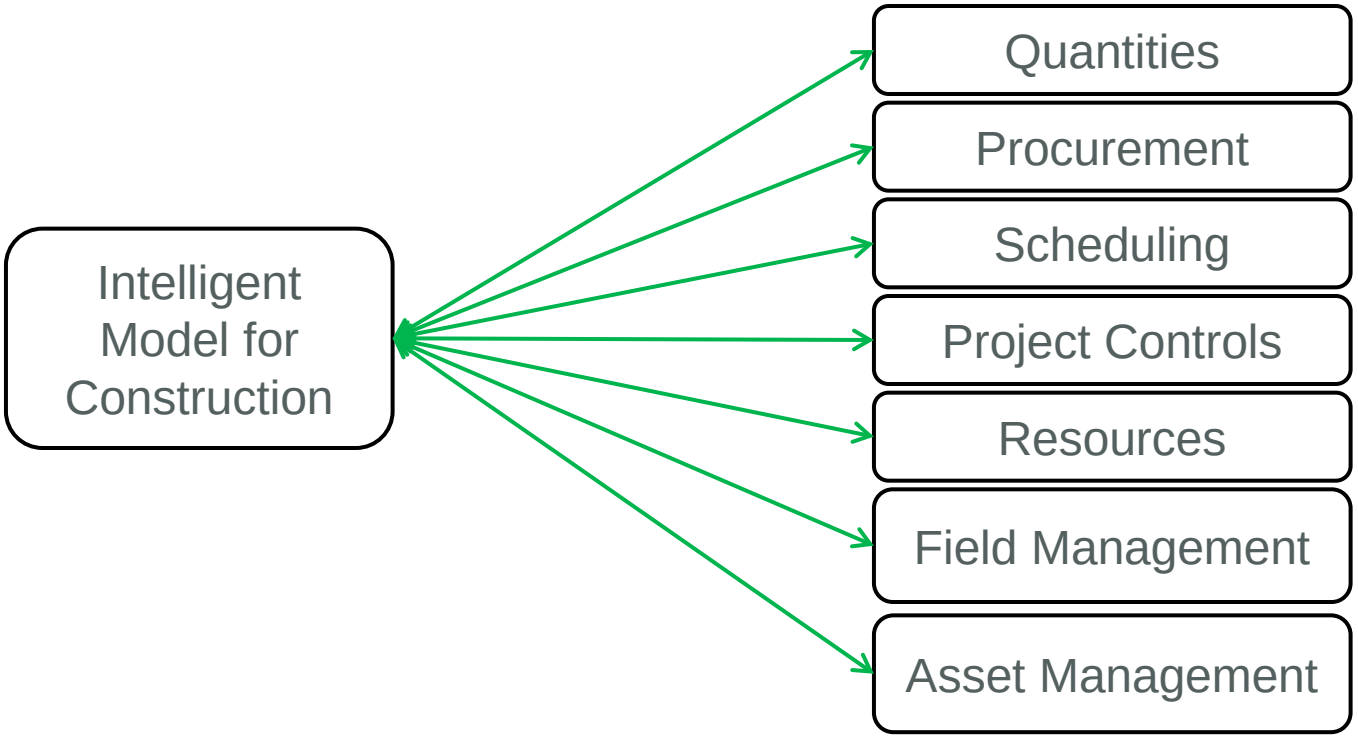
Corey Johnson
Director of Product Management



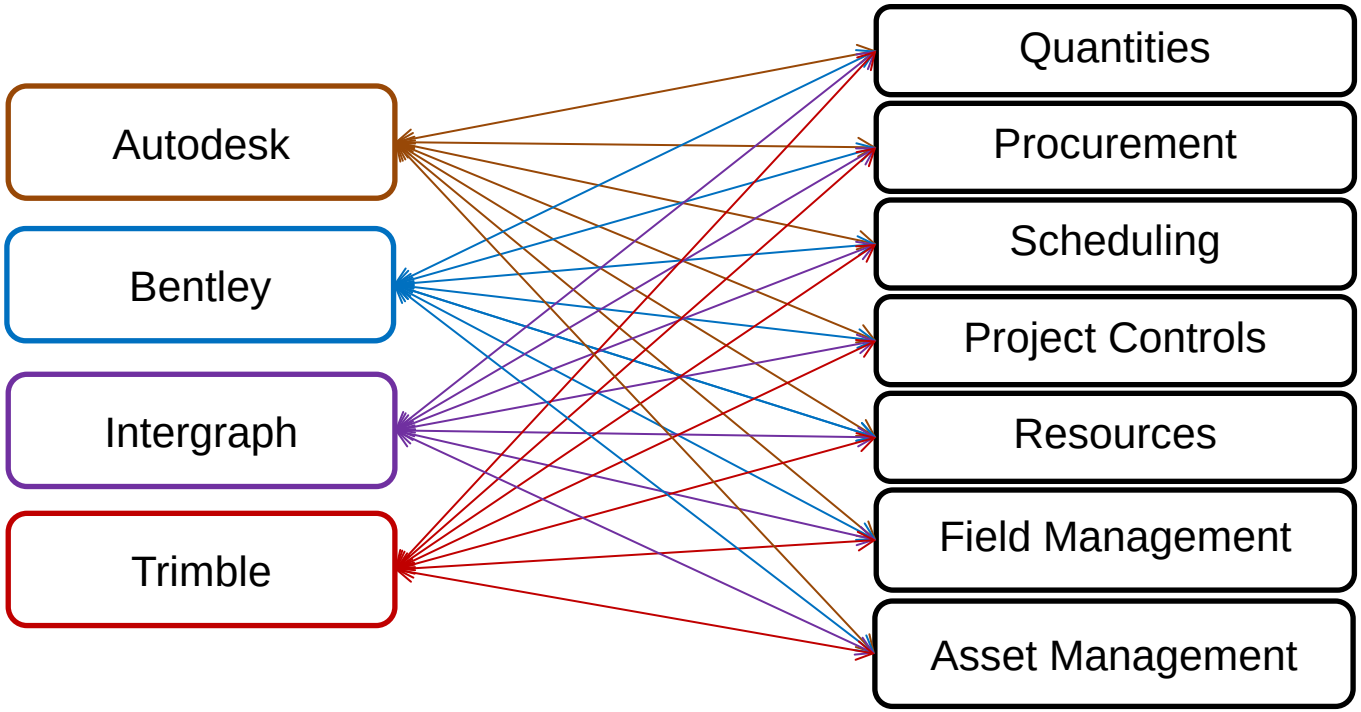
InfinyD:

brings open 3D models, your team's experience and business information to the forefront of operations introducing advanced model based querying and reporting from the data sources systems of record

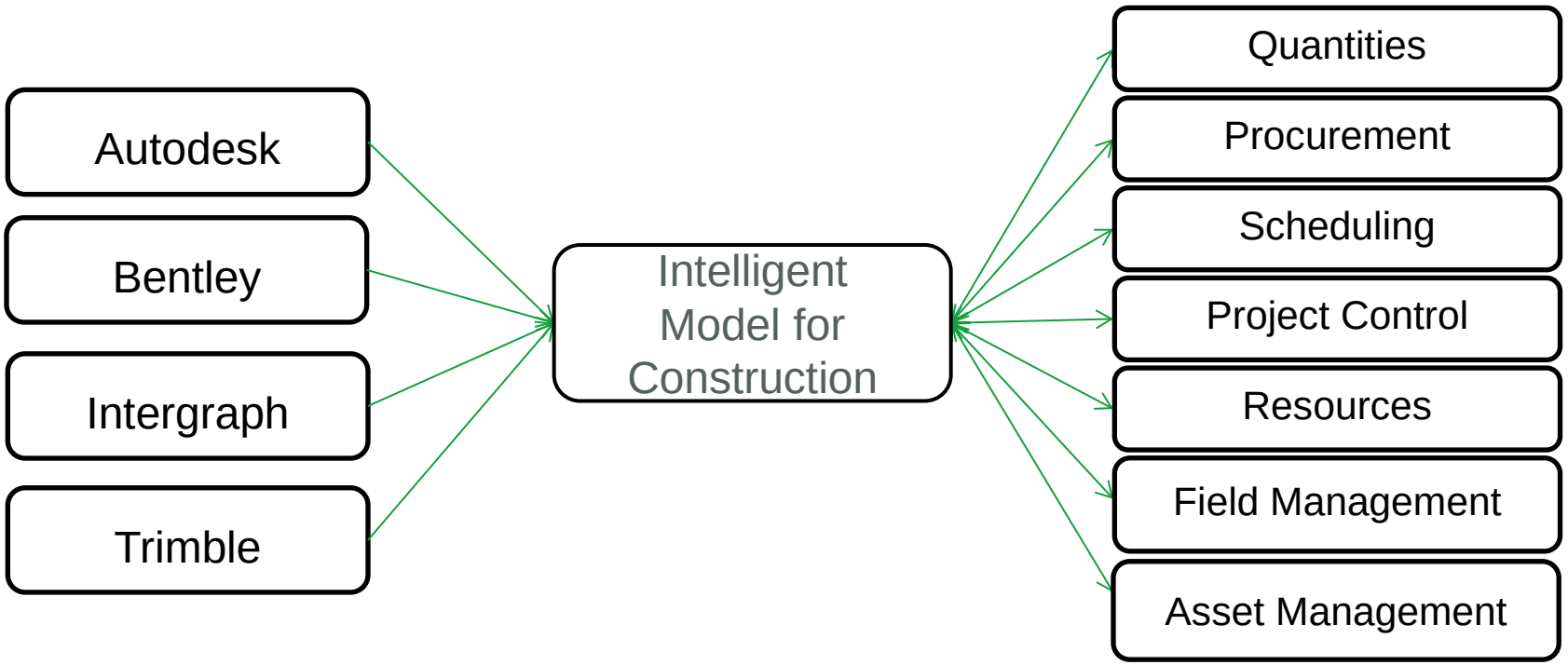
One Model for Construction



Challenge then becomes…

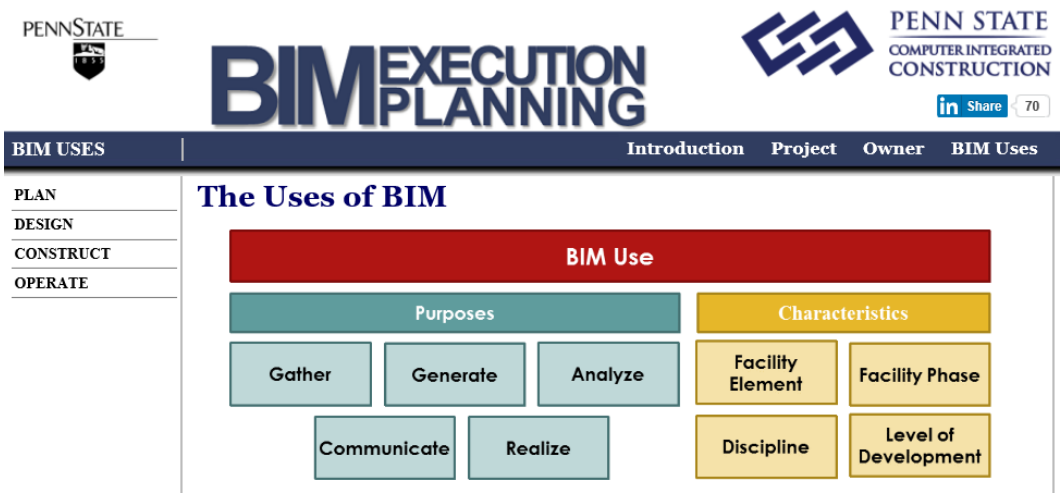


Solution


Autodesk
Bentley
Intergraph
Trimble
Intelligent Model for Construction
Quantities
Procurement
Scheduling
Project Control
Resources
Field Management
Asset Management

Model Based Workflow

- Import Models
- Enhance Model for Missing Information
- Check Model for Errors
- Error Report
- FDE Report (Facility Data Exchange)



http://bim.psu.edu/Uses/

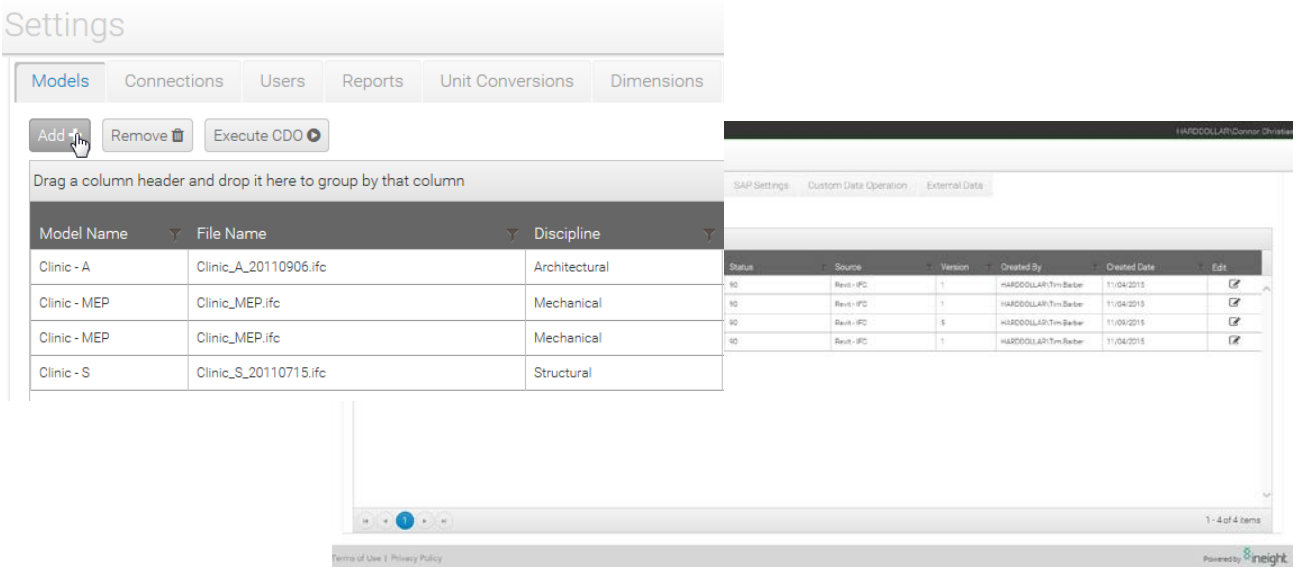
Model Based Workflow Issues

- Need Models from Multiple Sources
- Models may be Missing Data
- Data may need to be added for Owner Req.
- Errors need to be Documented and Communicated
- Data needs to be populated by many parties
- FDE Worksheet needs to be filled out

Gather

InfinyD import Options

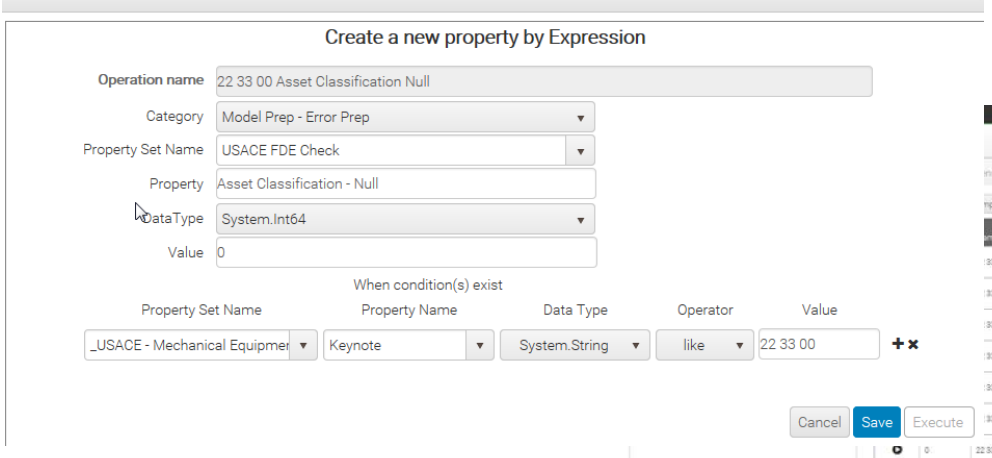
- Industry Foundation Class (IFC)
- Navisworks Document (NWD)

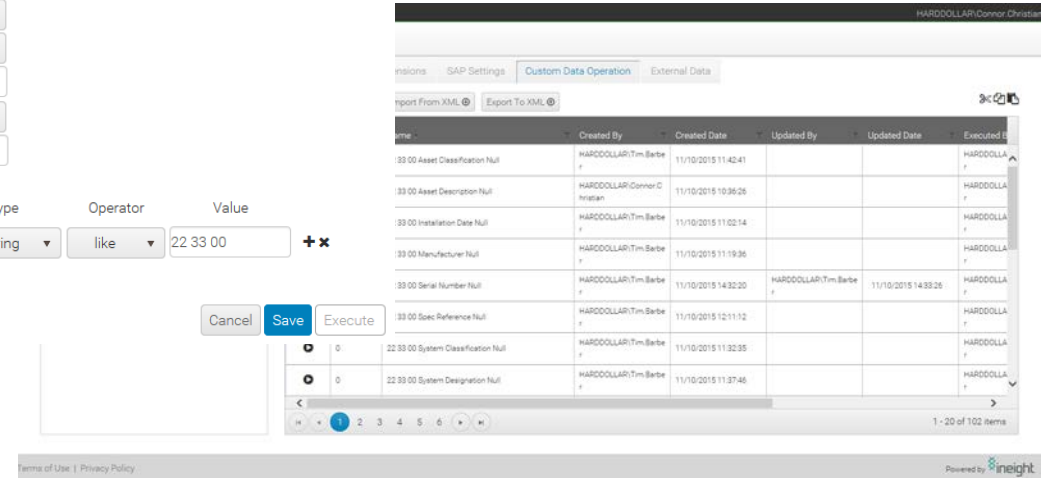


Generate

Custom Data Operations

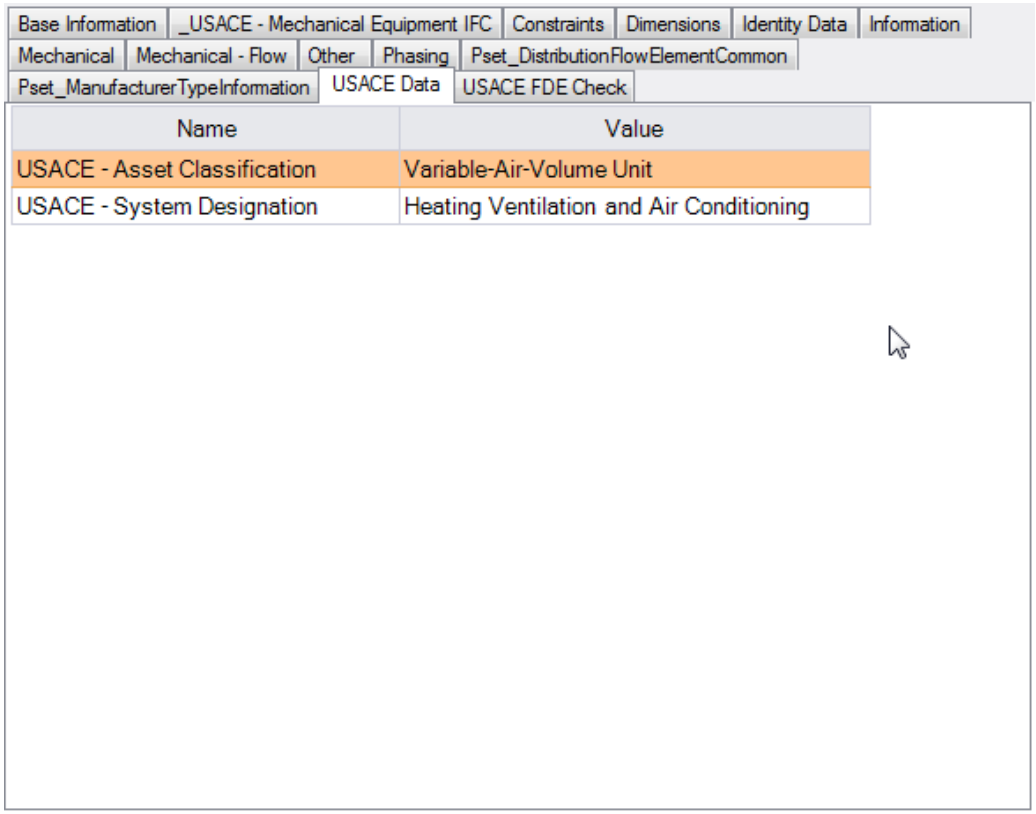
- Emergency Lights
- Owner Asset Classification
- Owner System Designation





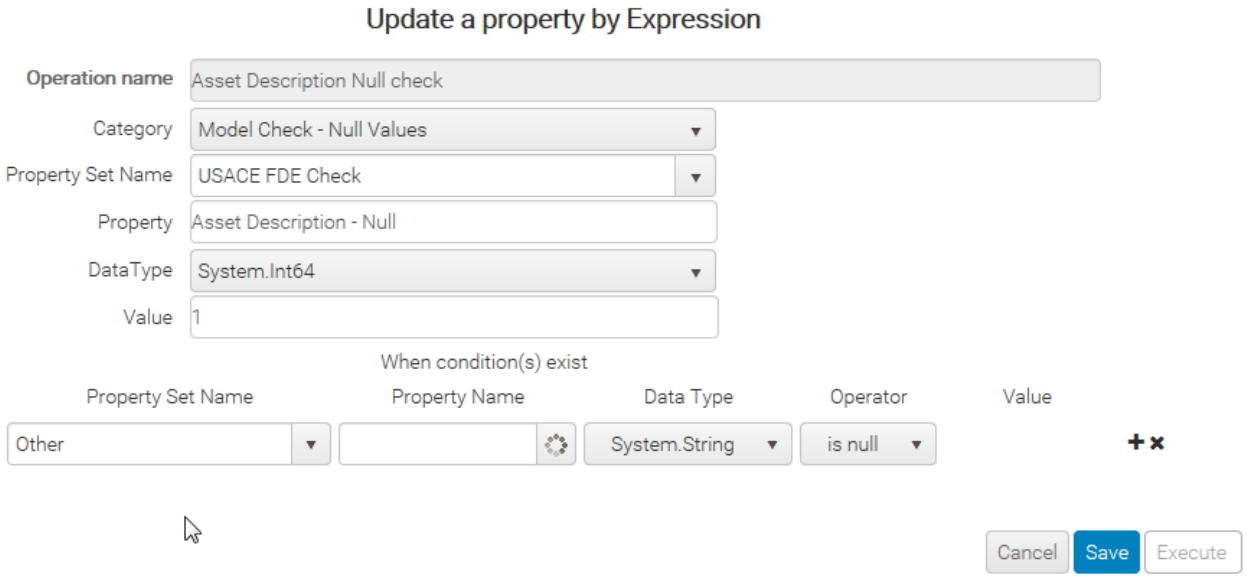
Generate

Owner Data Property Set



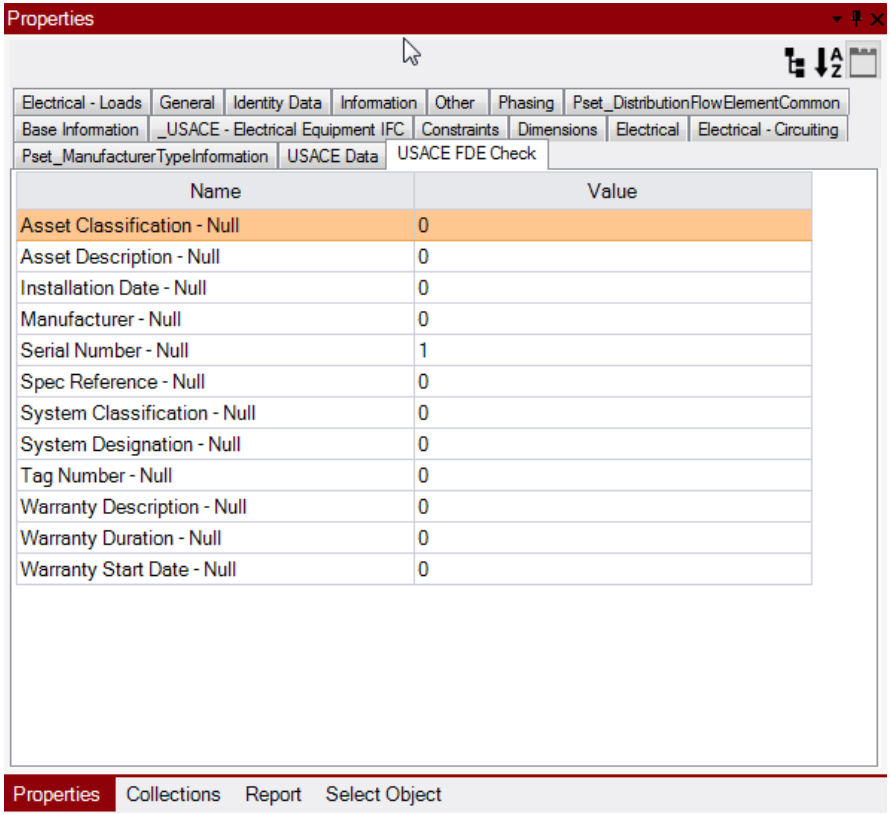
Analyze

- Custom Data Operations
  - Check for Null Values



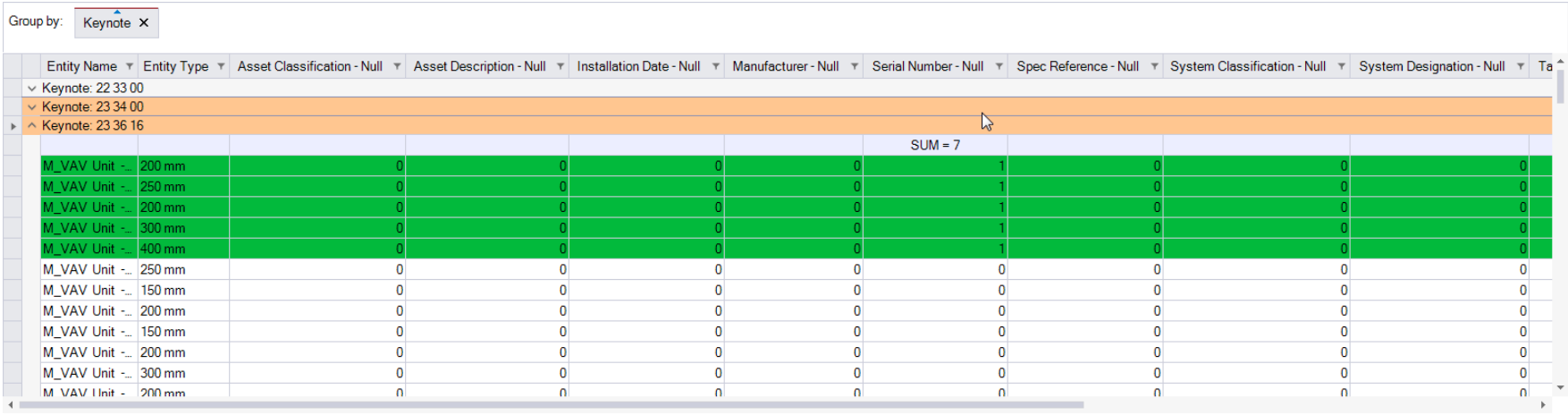
Analyze

Owner FDE Check Property Set



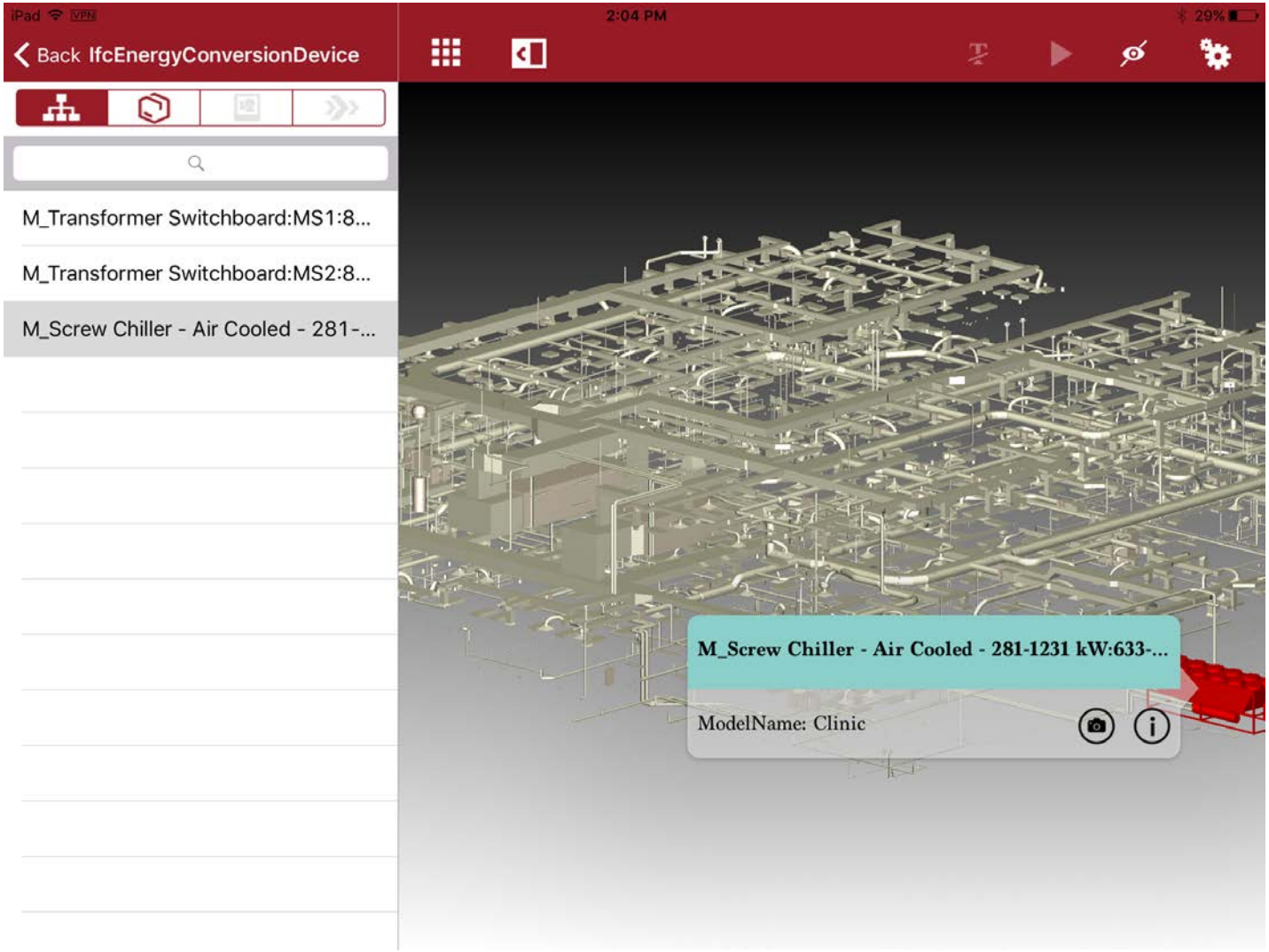
Communicate

Data Report and Export



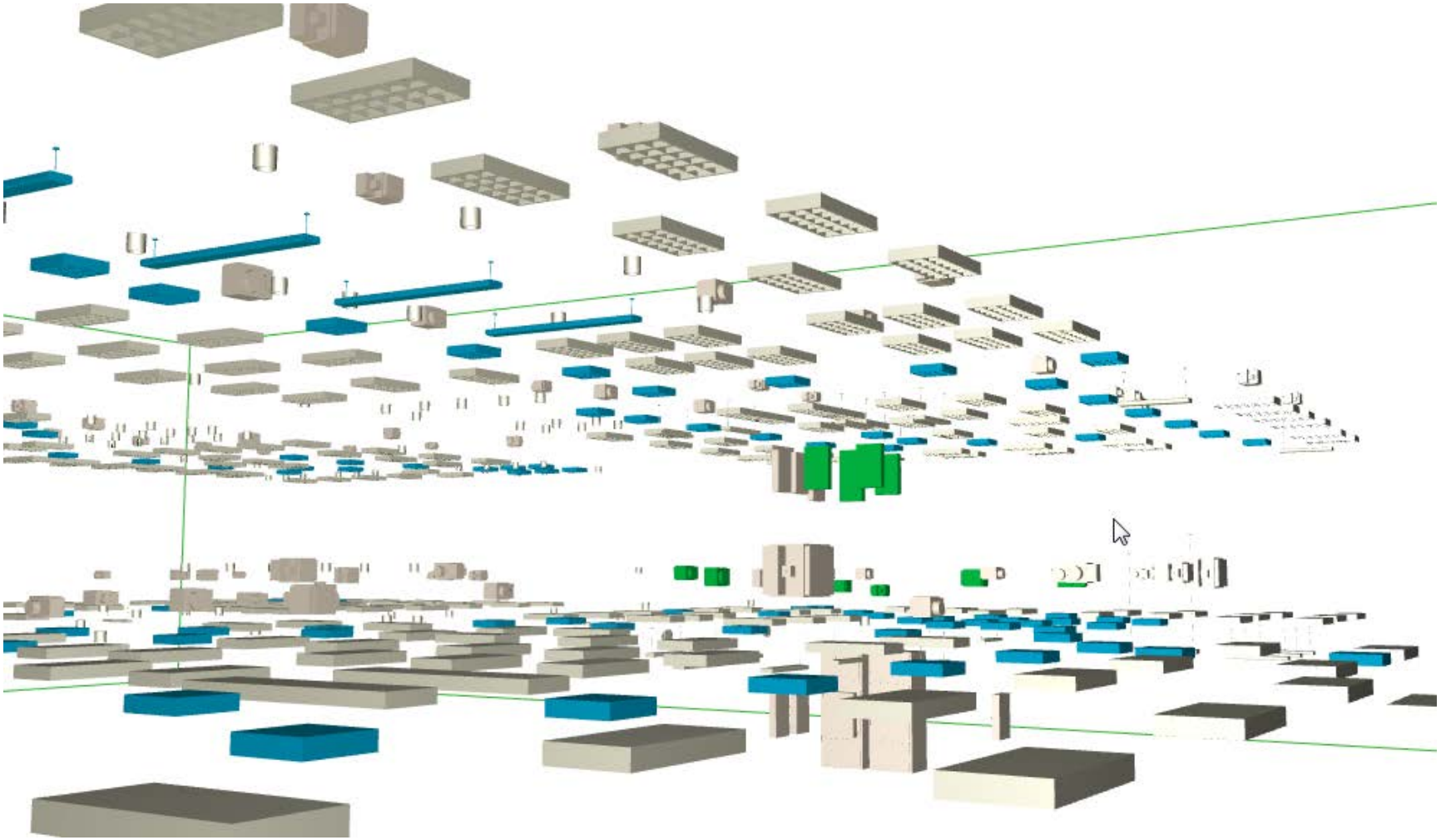
Communicate to Field

Field Data Entry



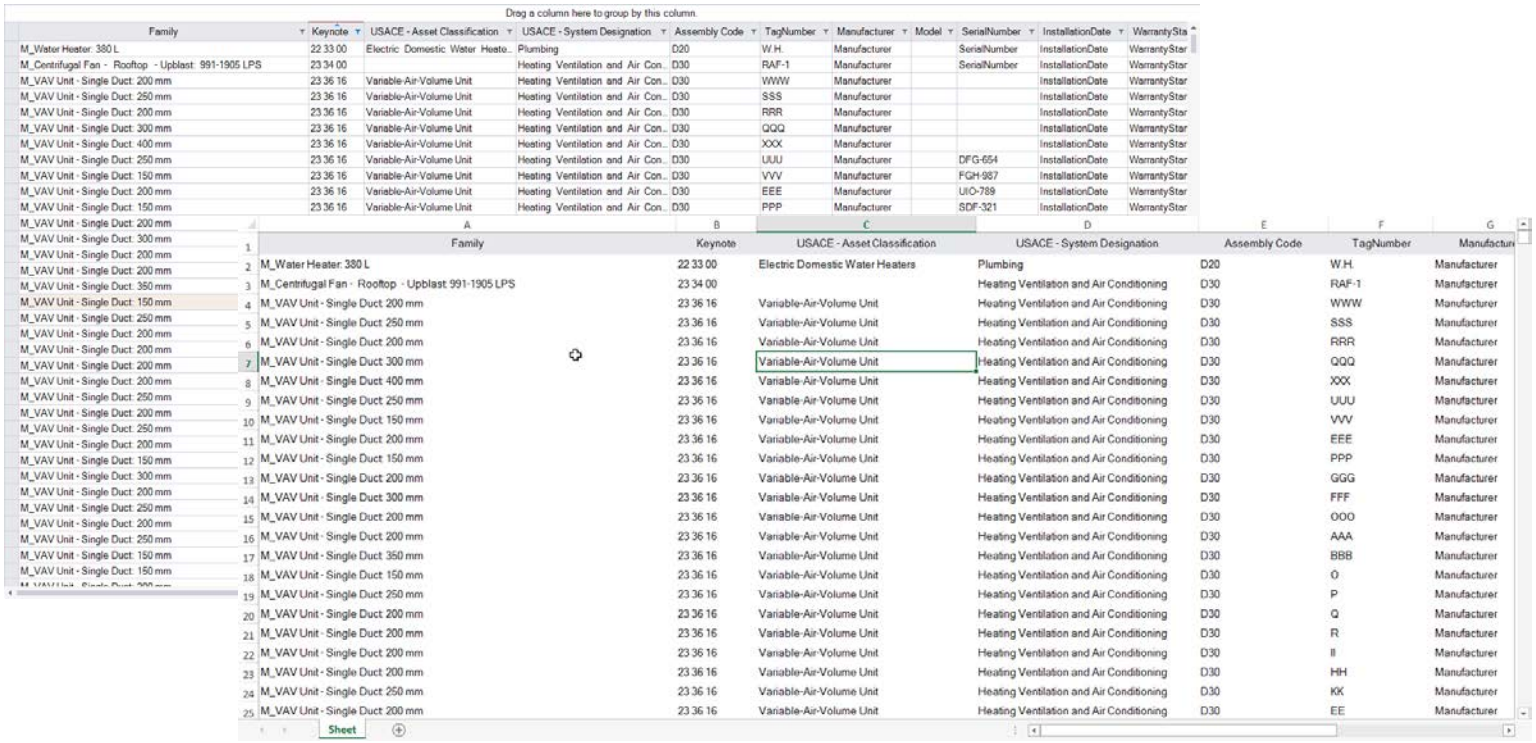
Communicate

Visual Report



Realize

Data Report and Export



Drag a column here to group by this column.

Family	Keynote	USACE - Asset Classification	USACE - System Designation	Assembly Code	TagNumber	Manufacturer	Model	SerialNumber	InstallationDate	WarrantySta
M_Water Heater: 380 L	22 33 00	Electric Domestic Water Heate..	Plumbing	D20	W.H.	Manufacturer		SerialNumber	InstallationDate	WarrantyStar
M_Centrifugal Fan - Rooftop - Upblast: 991-1905 LPS	23 34 00		Heating Ventilation and Air Con..	D30	RAF-1	Manufacturer		SerialNumber	InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	WWW	Manufacturer			InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 250 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	SSS	Manufacturer			InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	RRR	Manufacturer			InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 300 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	QQQ	Manufacturer			InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 400 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	XXX	Manufacturer			InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 250 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	UUU	Manufacturer		DFG-654	InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 150 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	VVV	Manufacturer		FGH-987	InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	EEE	Manufacturer		UIO-789	InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 150 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Con..	D30	PPP	Manufacturer		SDF-321	InstallationDate	WarrantyStar
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 300 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 350 mm										
M_VAV Unit - Single Duct: 150 mm										
M_VAV Unit - Single Duct: 250 mm										
M_VAV Unit - Single Duct: 200 mm										
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M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 250 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 250 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 150 mm										
M_VAV Unit - Single Duct: 300 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 250 mm										
M_VAV Unit - Single Duct: 200 mm										
M_VAV Unit - Single Duct: 250 mm										
M_VAV Unit - Single Duct: 150 mm										
M_VAV Unit - Single Duct: 150 mm										

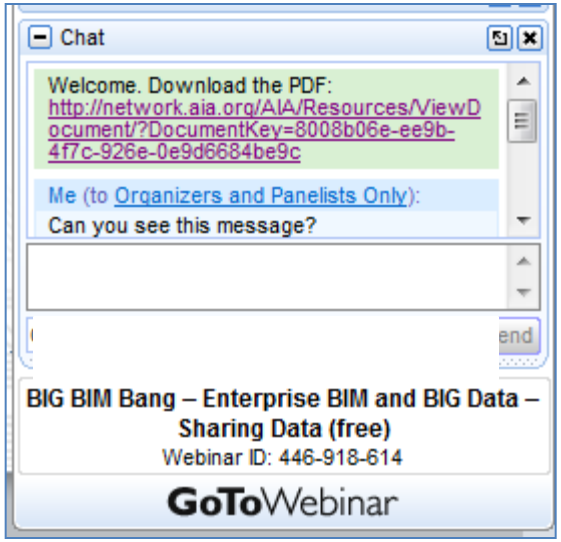
	A	B	C	D	E	F	G
1	Family	Keynote	USACE - Asset Classification	USACE - System Designation	Assembly Code	TagNumber	Manufactur
2	M_Water Heater: 380 L	22 33 00	Electric Domestic Water Heaters	Plumbing	D20	W.H.	Manufacturer
3	M_Centrifugal Fan - Rooftop - Upblast: 991-1905 LPS	23 34 00		Heating Ventilation and Air Conditioning	D30	RAF-1	Manufacturer
4	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	WWW	Manufacturer
5	M_VAV Unit - Single Duct: 250 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	SSS	Manufacturer
6	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	RRR	Manufacturer
7	M_VAV Unit - Single Duct: 300 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	QQQ	Manufacturer
8	M_VAV Unit - Single Duct: 400 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	XXX	Manufacturer
9	M_VAV Unit - Single Duct: 250 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	UUU	Manufacturer
10	M_VAV Unit - Single Duct: 150 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	VVV	Manufacturer
11	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	EEE	Manufacturer
12	M_VAV Unit - Single Duct: 150 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	PPP	Manufacturer
13	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	GGG	Manufacturer
14	M_VAV Unit - Single Duct: 300 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	FFF	Manufacturer
15	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	OOO	Manufacturer
16	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	AAA	Manufacturer
17	M_VAV Unit - Single Duct: 350 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	BBB	Manufacturer
18	M_VAV Unit - Single Duct: 150 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	O	Manufacturer
19	M_VAV Unit - Single Duct: 250 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	P	Manufacturer
20	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	Q	Manufacturer
21	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	R	Manufacturer
22	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	II	Manufacturer
23	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	HH	Manufacturer
24	M_VAV Unit - Single Duct: 250 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	KK	Manufacturer
25	M_VAV Unit - Single Duct: 200 mm	23 36 16	Variable-Air-Volume Unit	Heating Ventilation and Air Conditioning	D30	EE	Manufacturer

Sheet

Q&A Time

If you have questions for today's presenters, please submit them to the moderator via the chat box.

Content-related questions will be answered during this Q&A portion as time allows.



Thank you for joining us!

This concludes the AIA/CES Course **#TAP1601.** The webinar survey/report form URL is listed in the chat box ***and*** will be included in the follow-up email sent to you in the next hour.

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