

***Building Information Modeling (BIM)
and
Integrated Project Delivery
for
“Large scale Projects in
Asian Markets at par with Global standards”***

Ravi Ray Wood

BIM Manager

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ABOUT THE PRESENTER

Ravi Ray Wood is an Expert BIM Manager and licensed Architect with projects across USA, UK, Middle East, Canada, Mexico, Singapore and India. He specializes in BIM execution and implementation across large scale projects including Infrastructure, Residential, Hospitals, Commercial and Retail. His astute acumen and proven track record in handling large teams to optimize resources and successful deliver BIM projects has helped projects become more profitable for both the clients and companies. His passion to Innovate new processes and technology in BIM continues to help transform challenges to opportunity and problem to successful solutions.



Masters of Architecture & Planning
KANSAS STATE UNIVERSITY

Bachelors of Architecture
VNIT India

Council of Architecture (CoA), IIA, AIA

LEED Professional

Associate Member of APA (American Planners Association)

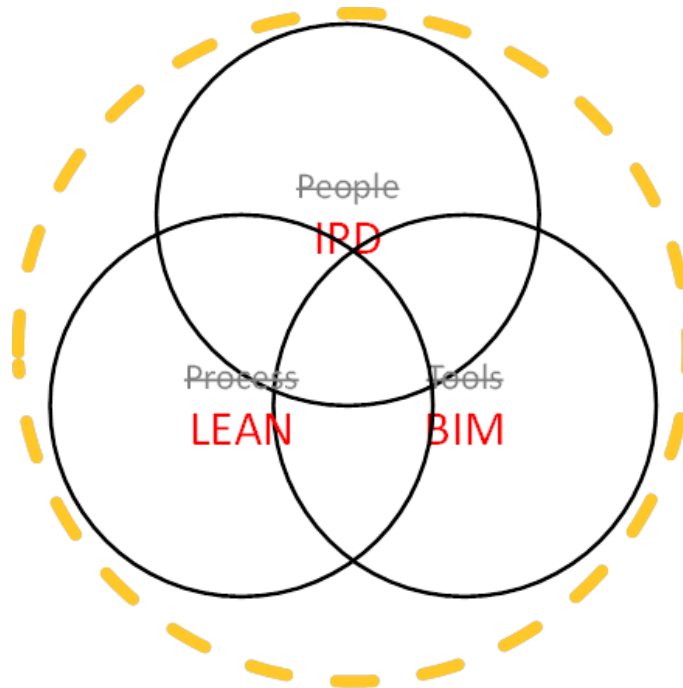


Ice Breakers

What happens without BIM



BIM IPD



Integrated Enviroment



Cornerstones of construction project



Requirements

Concept

Detail

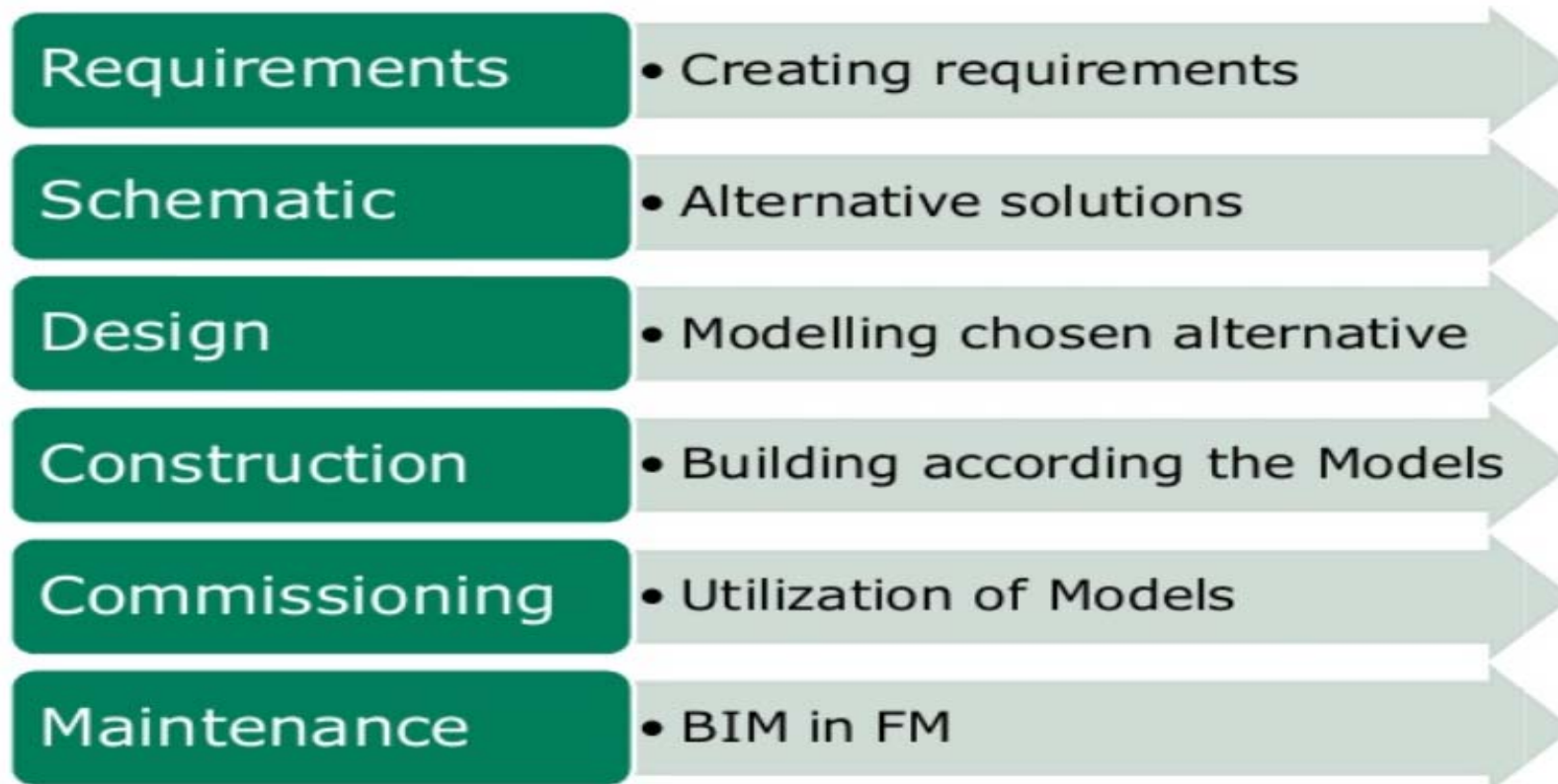
Construction

Commissioning

Maintenance



BIM IPD Stages and Goals



BIM IMP Stages and Goals

Energy and Comfort simulations



Requirements

Concept

Detail

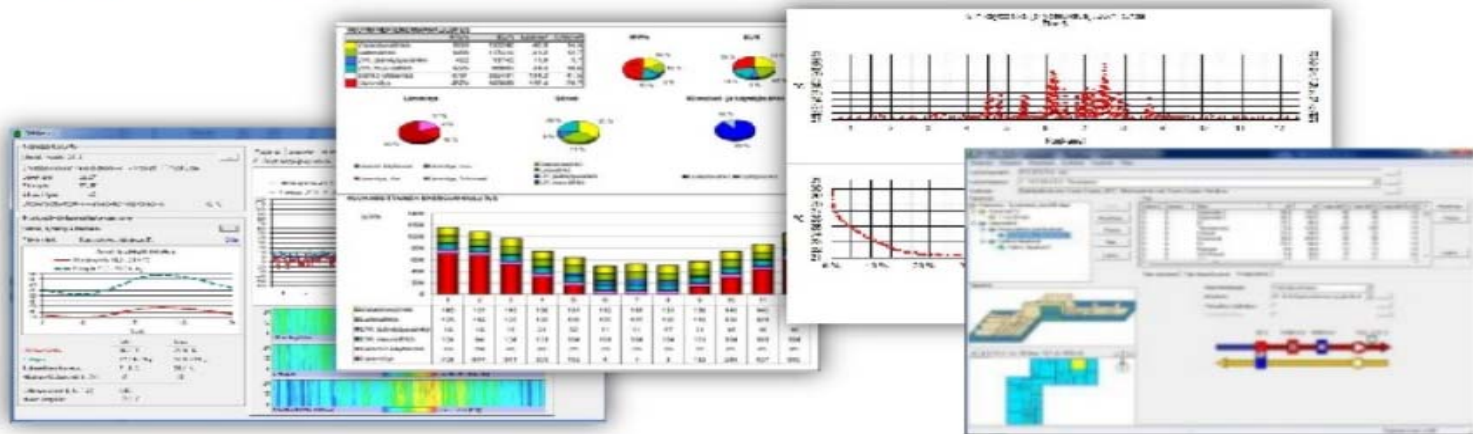
Construction

Commissioning

Maintenance

Dynamic simulation of energy and comfort is made according to the requirements, building model and service area charts.

- Every space is simulated
- Alternative simulations and comparisons for different envelopes, windows etc. -> beginning of LCC calculations



BIM Design Development

BIM in Design Development -phase

Design Development –phase specifies the investment costs, energy consumption and indoor air quality levels

Requirements

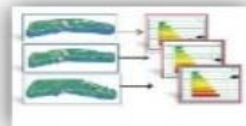
Schematic

Design

Construction

Commissioning

Maintenance



Alternative solutions



Sustainability



Life Cycle



Lighting Simulations



Diagrams and
equipment
databases



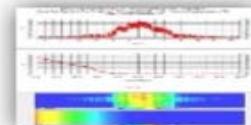
IFC



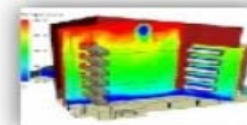
Technical Visualizations



Spatial provisions and
service area zones



Energy- and comfort
simulations



CFD-simulations



3D-mockups

BIM Detail Design AIA

BIM in Detail Design -phase

Detail Design is made according to the Design Development

Requirements

Schematic

Design

Construction

Commissioning

Maintenance



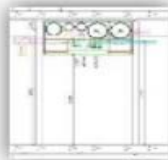
Combiel Models



Modelling of
MEP-networks



Model Auditing



Route Designing



SQL



IFC



Common BIM Requirements



BIM based
Provision of Voids



Information export from
models



Equipment
database

BIM DURING CONSTRUCTION PHASE

BIM in Construction -phase

Requirements

Schematic

Design

Construction

Commissioning

Maintenance

Installations are made according the Detailed Design Model



Combiend Models



Information export from
models



Model based assembly
inspection



Revisionhandling of
Models, Documents and
Equipment data



IFC



Equipment Validation

BIM During Commissioning

BIM in Commissioning

Requirements

Schematic

Design

Construction

Commissioning

Maintenance

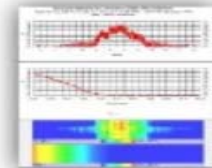
Information of BIM is used in Commissioning



Information export from models



IFC



Target values of energy consumption for Facility Management



As-Built Model



Assembly Inspections

BIM FM

BIM in Facility Management

Requirements

Schematic

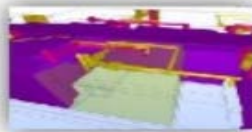
Design

Construction

Commissioning

Maintenance

BIM is helping Facility Management



Use of Models in
Facility Management



Service area zones



Equipment
database



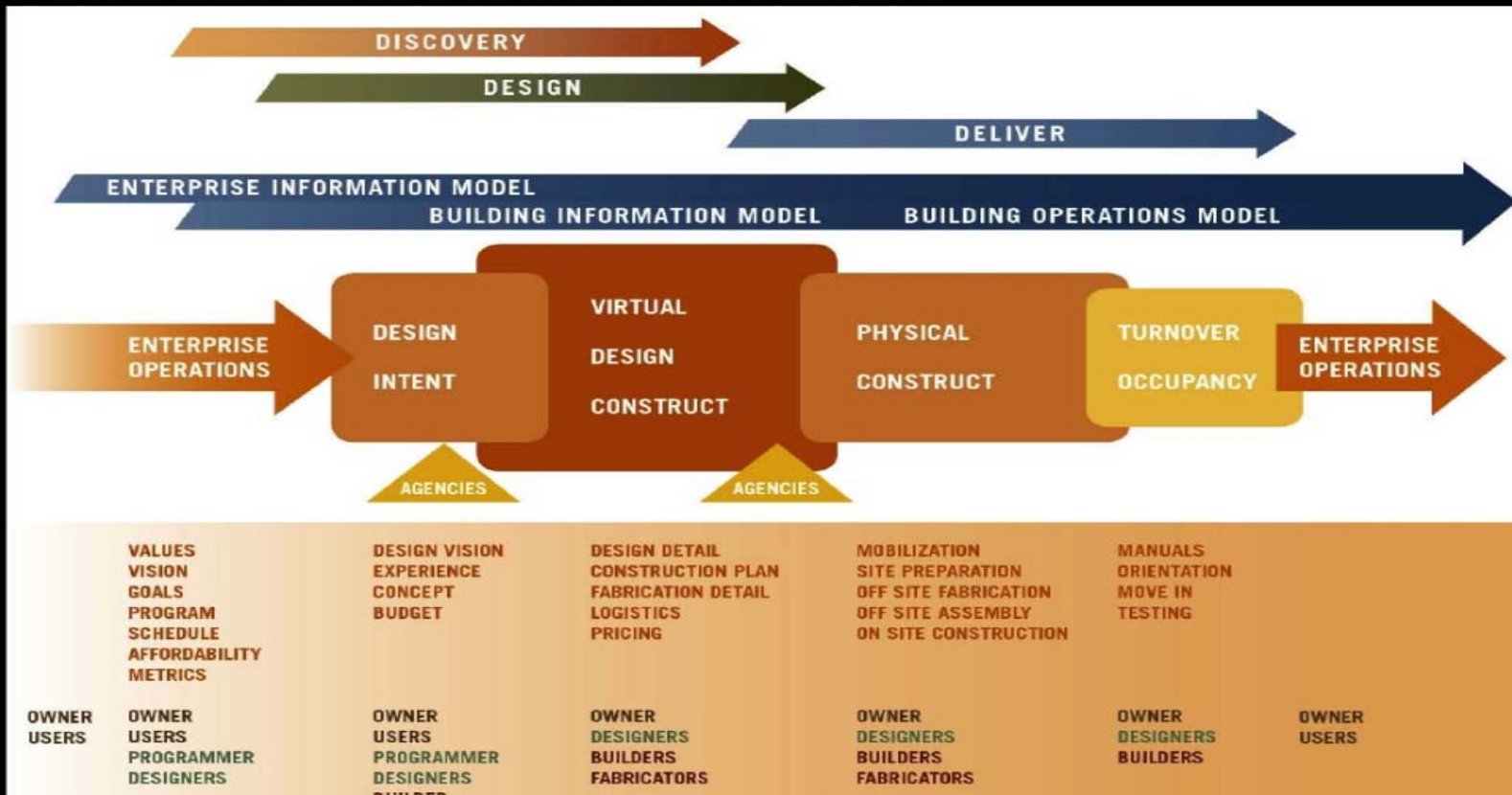
BIM Management Process
during building life cycle



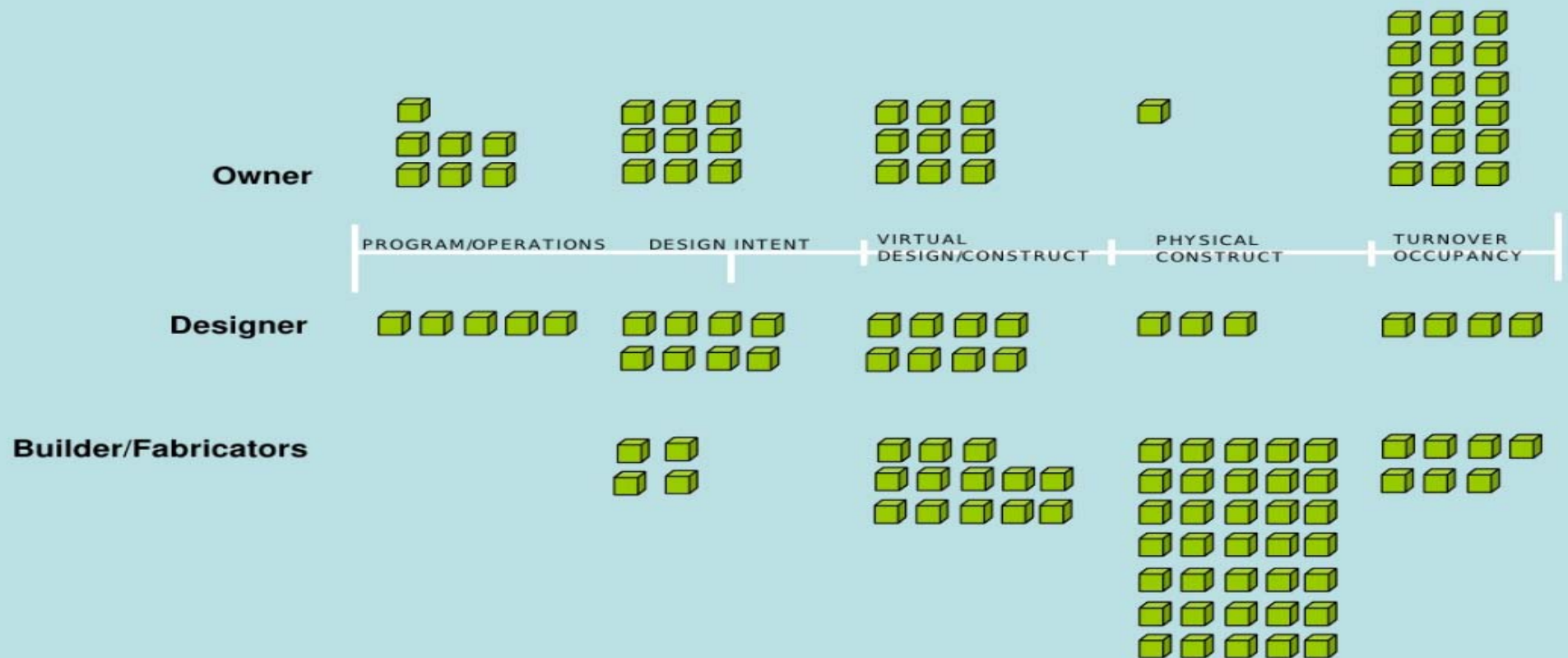
Monitoring
Energy Efficiency

- Part 1: IPD

“BEYOND COLLABORATION – THE BENEFITS OF INTEGRATED DELIVERY”



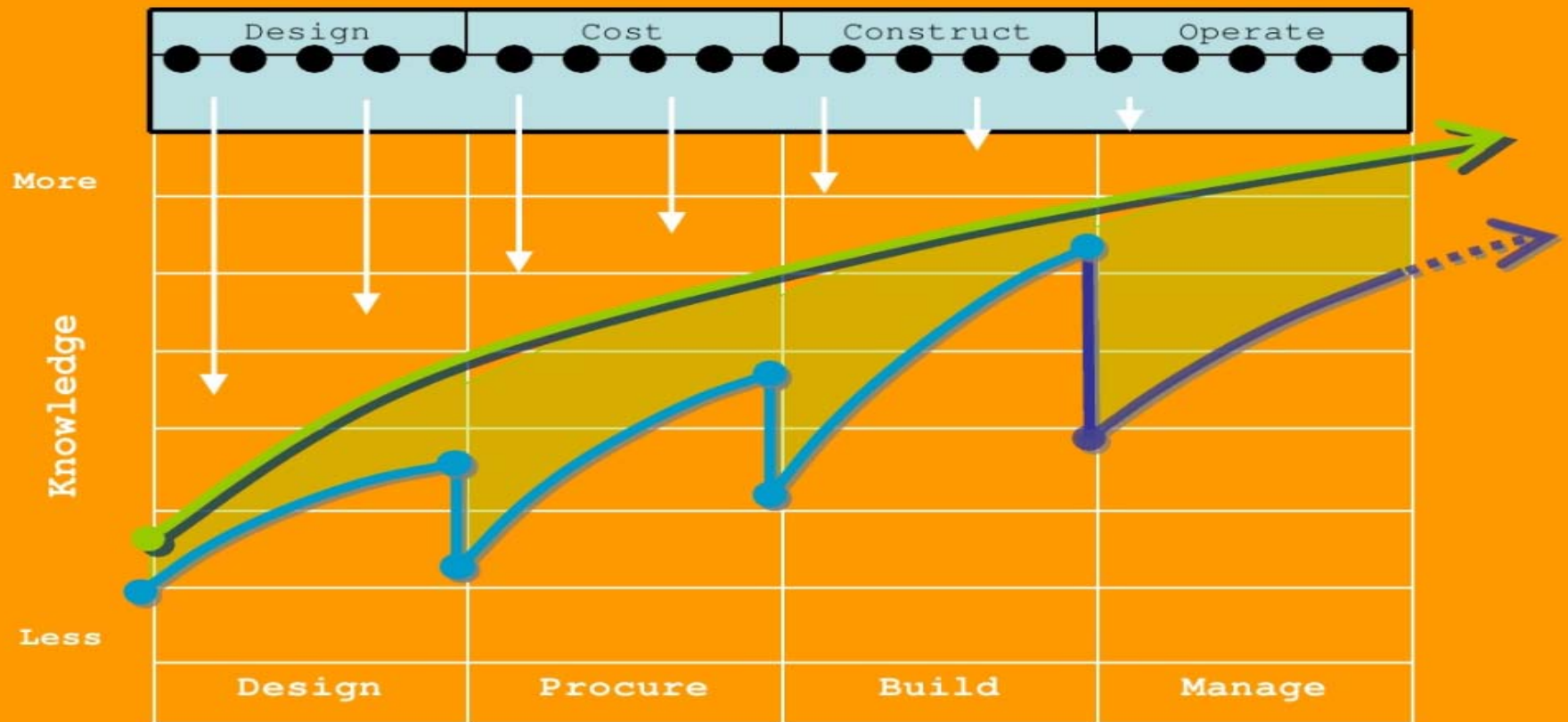
“BEYOND COLLABORATION – THE BENEFITS OF INTEGRATED DELIVERY”



“BEYOND COLLABORATION – THE BENEFITS OF INTEGRATED DELIVERY”

Traditional		Integrated Delivery
Fragmented, assembled on “just-as-needed” or “minimum-necessary” basis, strongly hierarchical, controlled	Teams	An Integrated team entity composed of all project lifecycle stakeholders, assembled early in the process, collaborative
Linear, distinct, segregated; knowledge gathered “just-as-needed”; information hoarded	Process	Concurrent, multi-level, integrated; early contributions of knowledge and expertise; information openly shared
Individually managed, transferred to the greatest extent possible	Risk	Collectively managed, appropriately shared
Individually pursued; minimum effort for maximum return; (usually) first-cost based	Compensation / Reward	Team success tied to project success; value-based
Paper-based, 2 dimensional; analog	Communications / Technology	Digitally based, virtual, 4 dimensional; Building Information Modeling
Minimum effort for maximum return; minimize or transfer risk; don’t share	Agreements	Encourage, foster, promote and support open sharing and collaboration, full integration
Individually focused, emphasis on composition	Education	Team-based, integrated, collaborative; technologically inclusive; a materials and methods focus in addition to composition

“BEYOND COLLABORATION – THE BENEFITS OF INTEGRATED DELIVERY”



slide courtesy of Autodesk

“BEYOND COLLABORATION – THE BENEFITS OF INTEGRATED DELIVERY”

From Constructors Viewpoint:

- Replace the conflict with teamwork
- Optimize industrialized workforce – offsite fabrication
- Reduce speculative crapshoot
- Share Rewards (w/risk)
- Early Involvement
- Common Goals
- Teamwork
- Utilizing Multiple Experiences/Expertise
- Reduced Costs
- Best Value/Product
- Creative Contracting
- Operational & Maintenance Savings
- Relationships

Legend
1. Main Building
2. Main Building (North Wing)
3. Main Building (South Wing)
4. Main Building (East Wing)
5. Main Building (West Wing)
6. Main Building (Central Core)
7. Main Building (Central Core)
8. Main Building (Central Core)
9. Main Building (Central Core)
10. Main Building (Central Core)
11. Main Building (Central Core)
12. Main Building (Central Core)
13. Main Building (Central Core)
14. Main Building (Central Core)
15. Main Building (Central Core)
16. Main Building (Central Core)
17. Main Building (Central Core)
18. Main Building (Central Core)
19. Main Building (Central Core)
20. Main Building (Central Core)

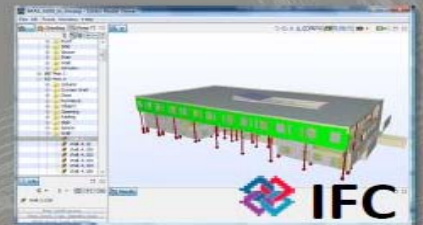
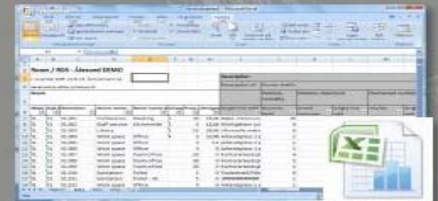
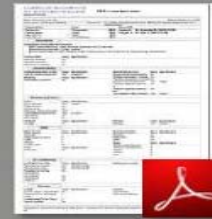
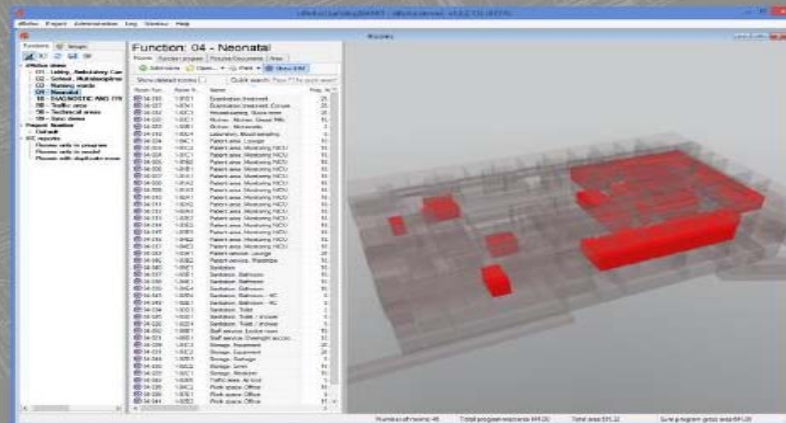




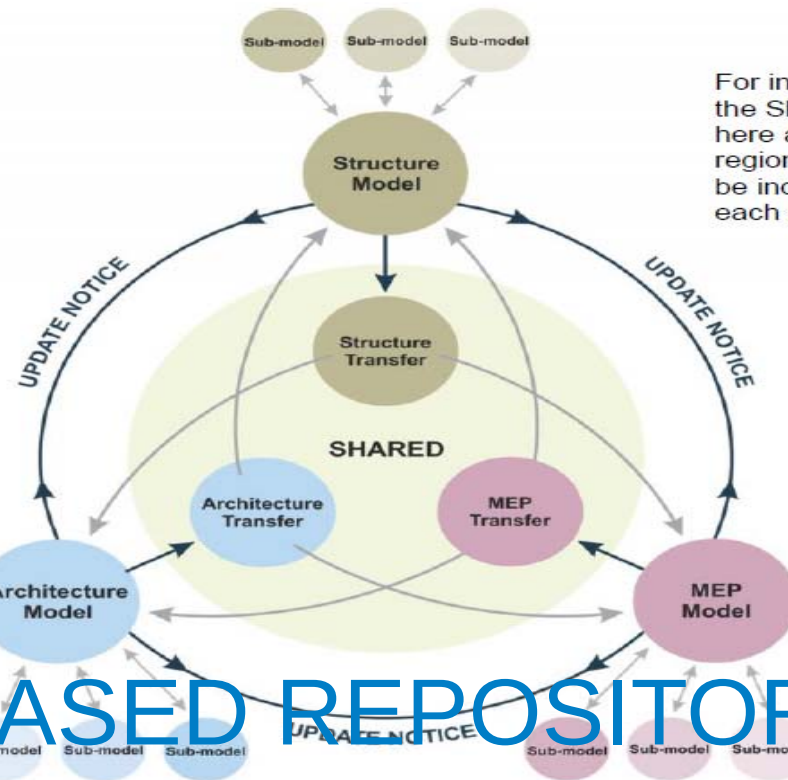
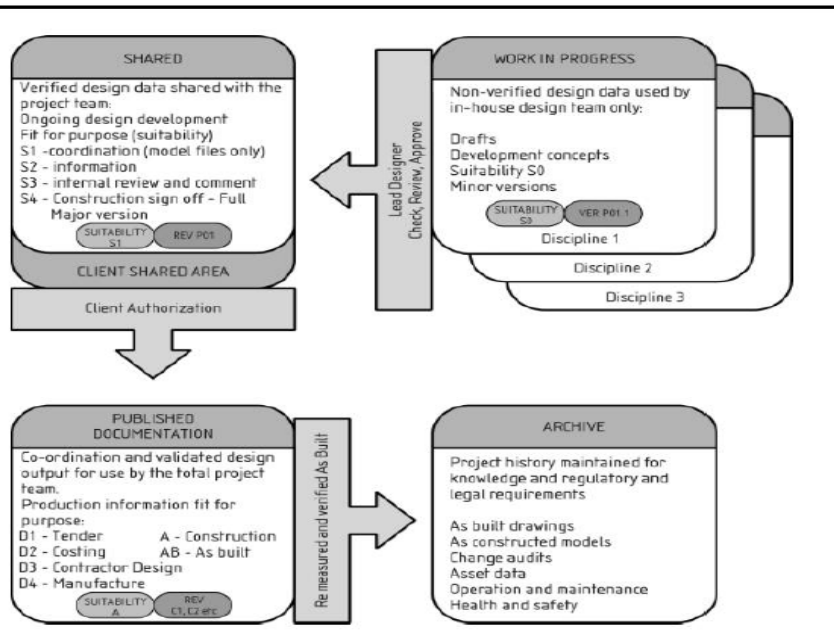
BIM COLLABORATION

BIM Interoperability

Connect the dots...



BIM Collaboration

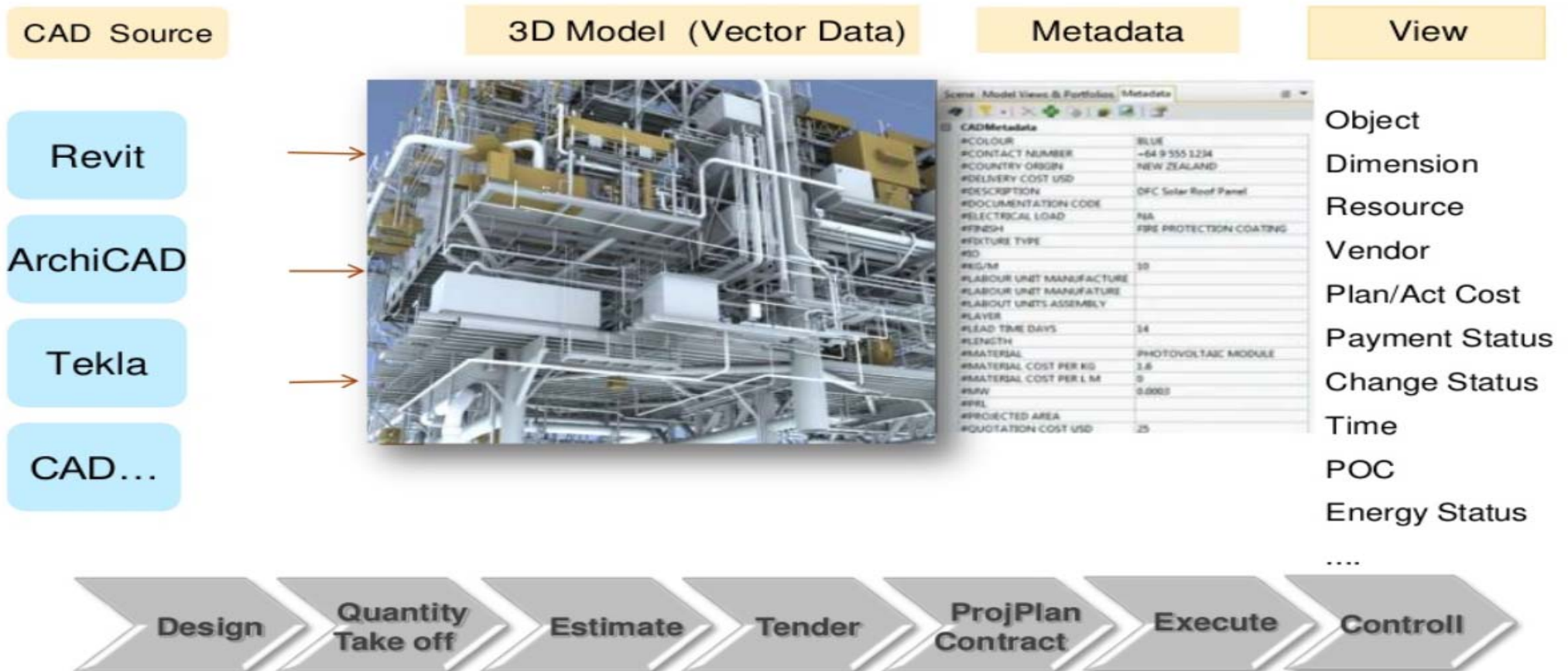


For indicative purposes, the Shared area is shown here as a single shaded region. This may, in truth be individual locations for each stakeholder.

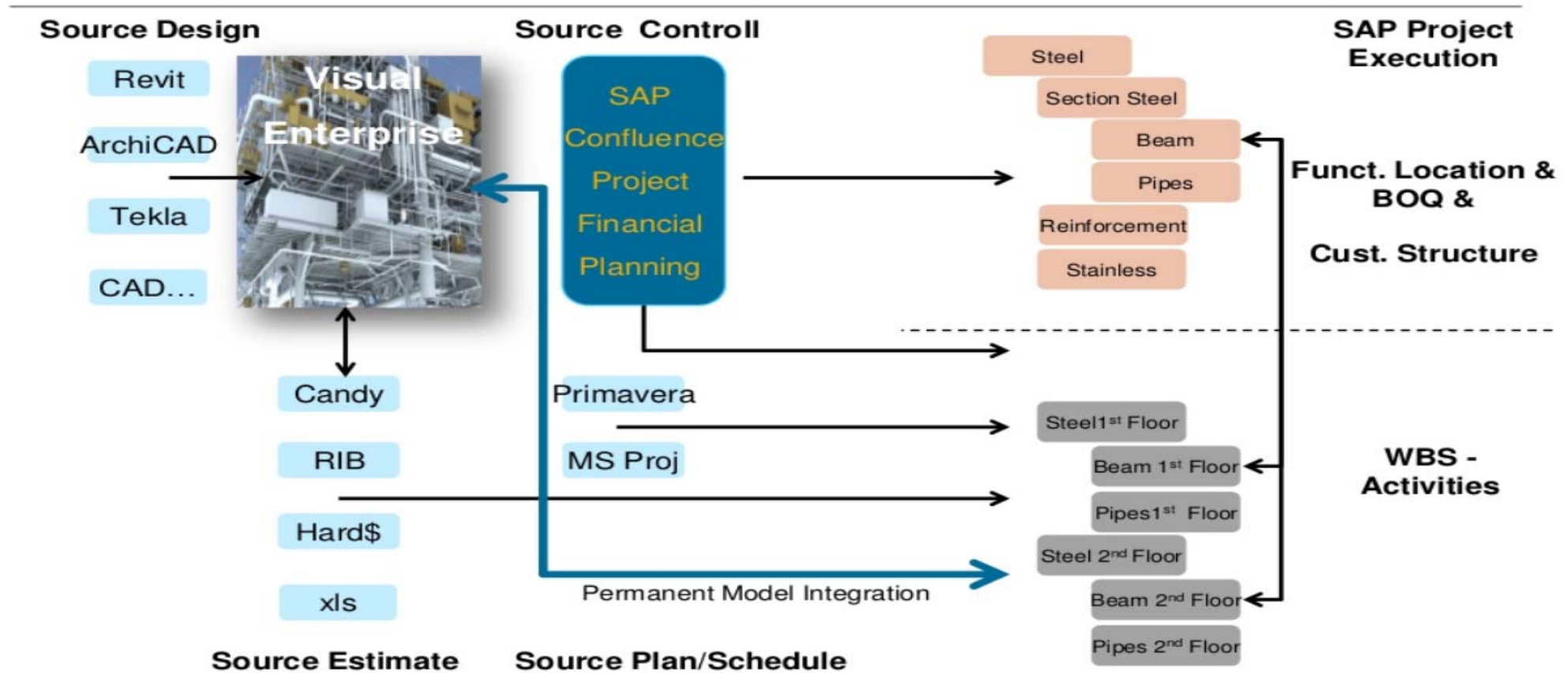
CREATING A WEB BASED REPOSITORY

Construction 3D Model Harmonization

Visibility in all projects of interest



Dataflow Architecture



Inter-Disciplinary Coordination

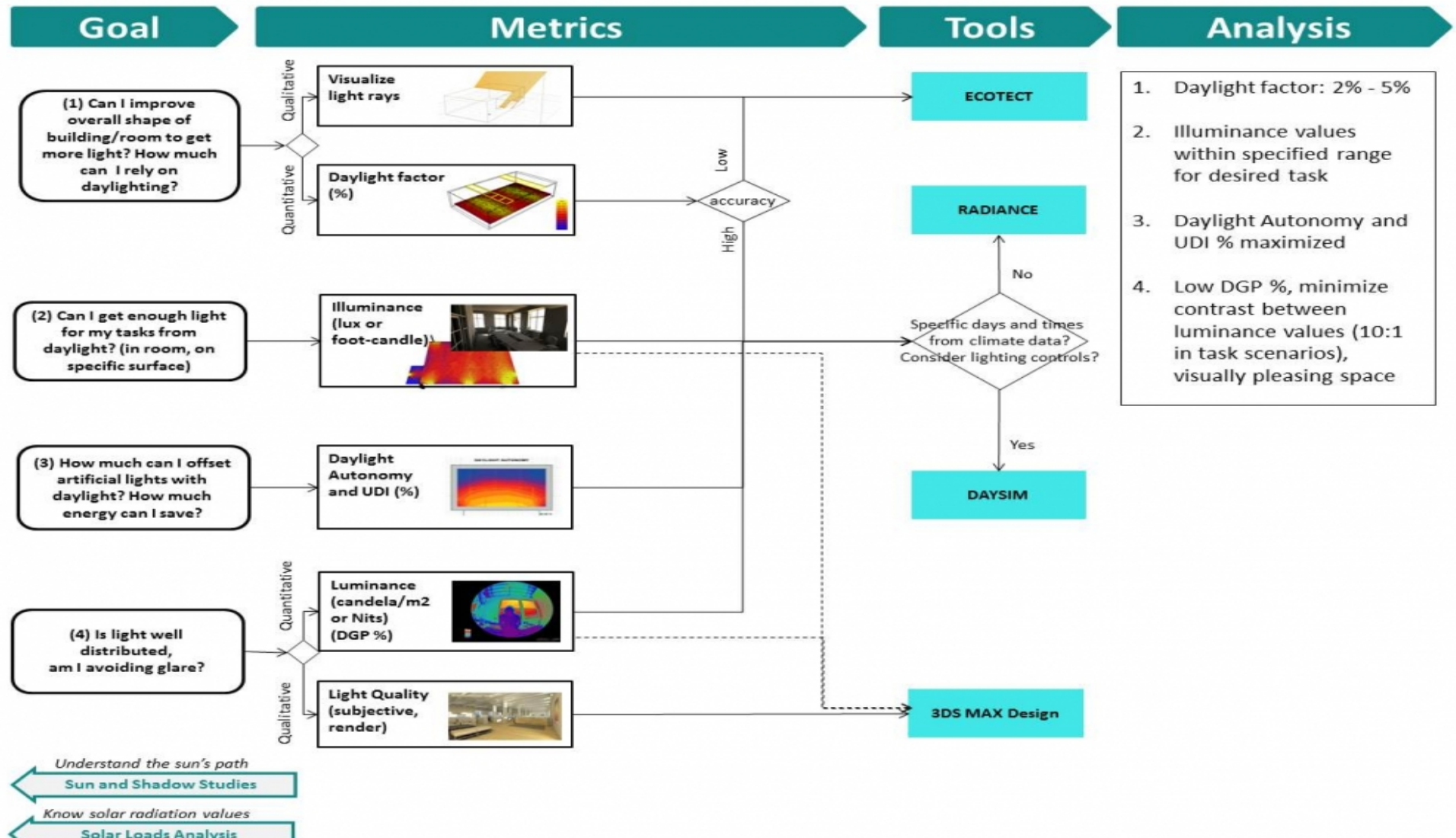
VIRTUAL REVIEW PROCESS | 330+ INFORMATION MODELS | 250+ VALIDATION RULES | 19+ DISCIPLINES, STAKEHOLDERS, CLIENT & CUSTOMER



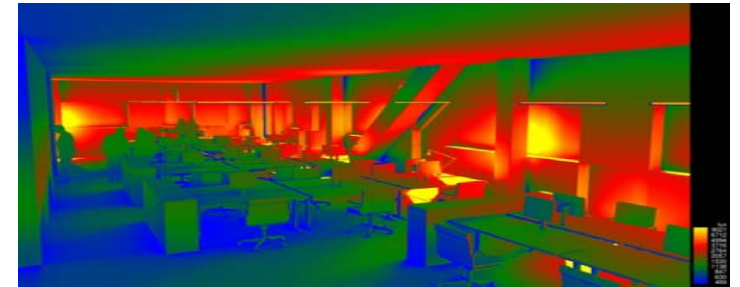
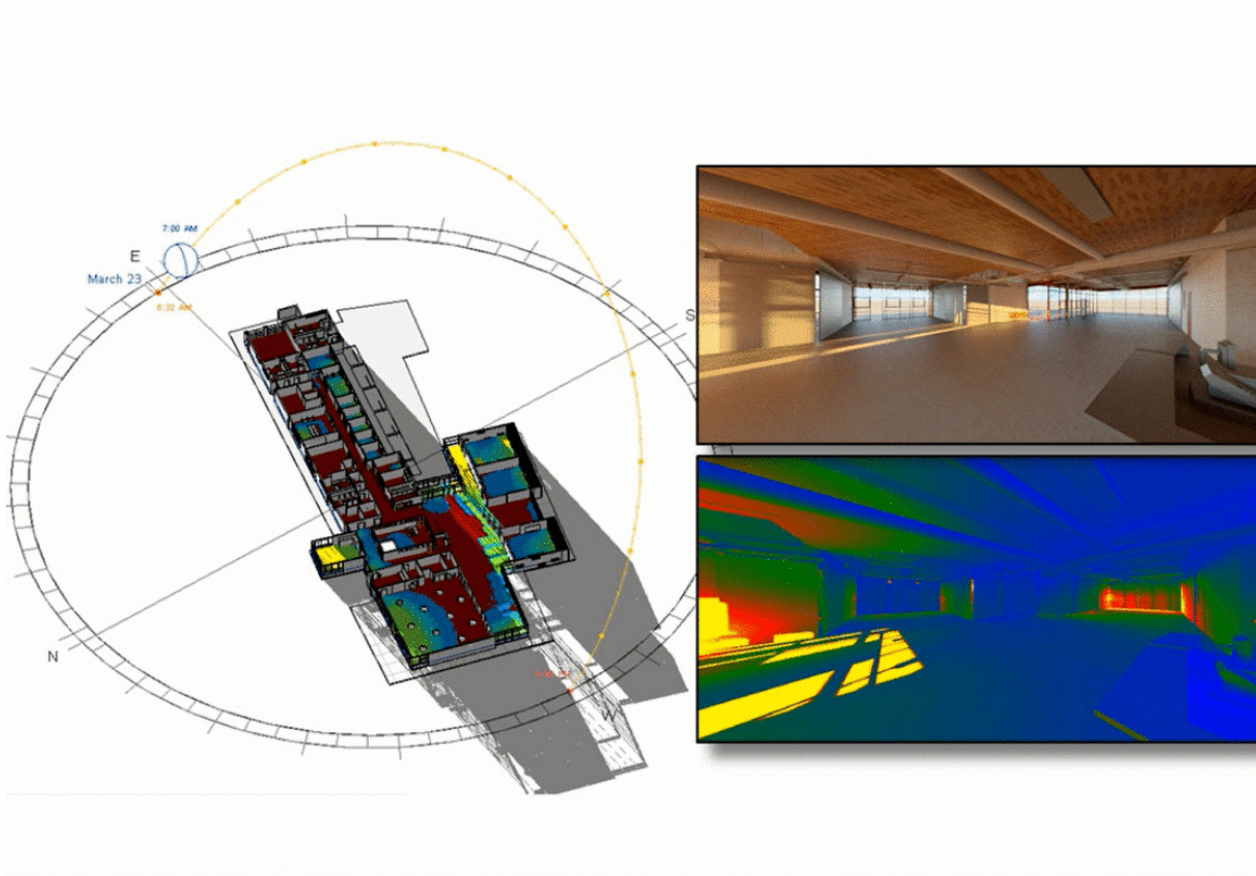


BIM ANALYSIS

Daylight Analysis for High Performance Building Design

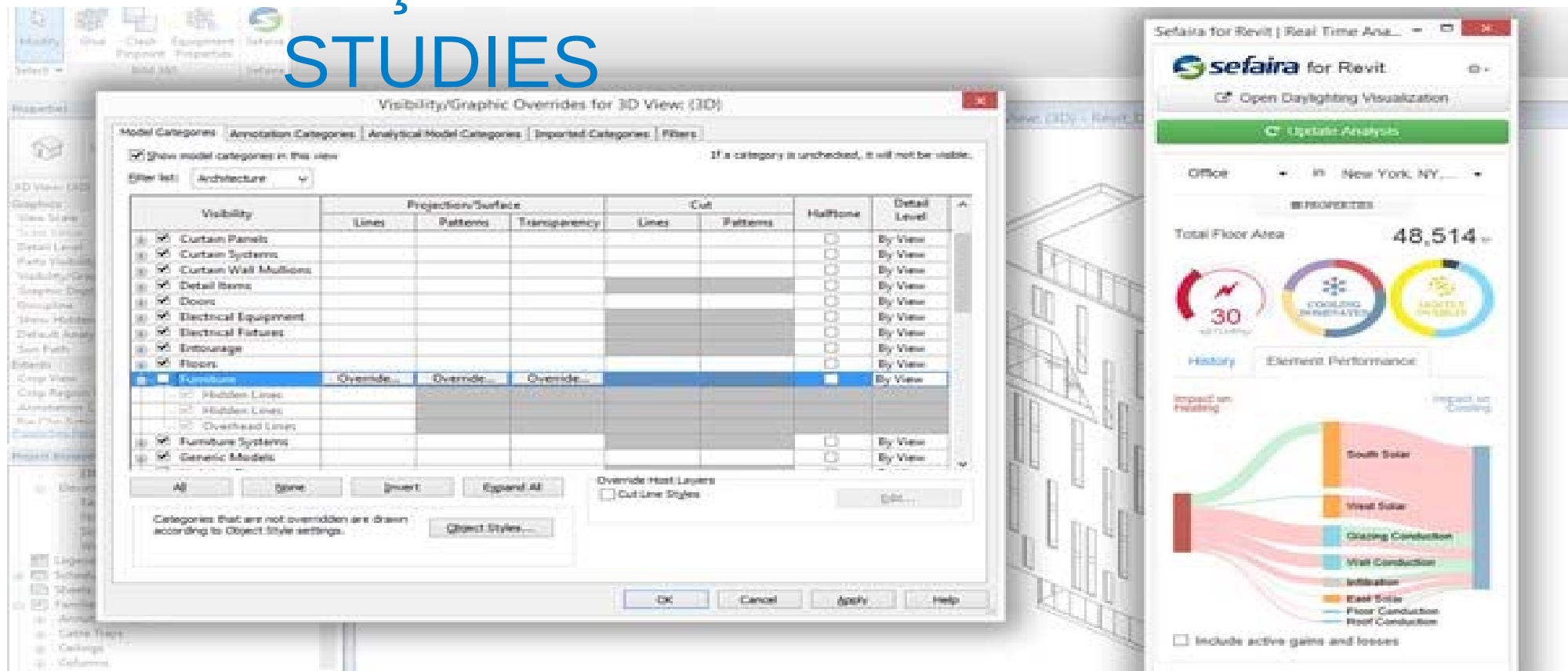


NO NIKE- DO IT
RIGHT

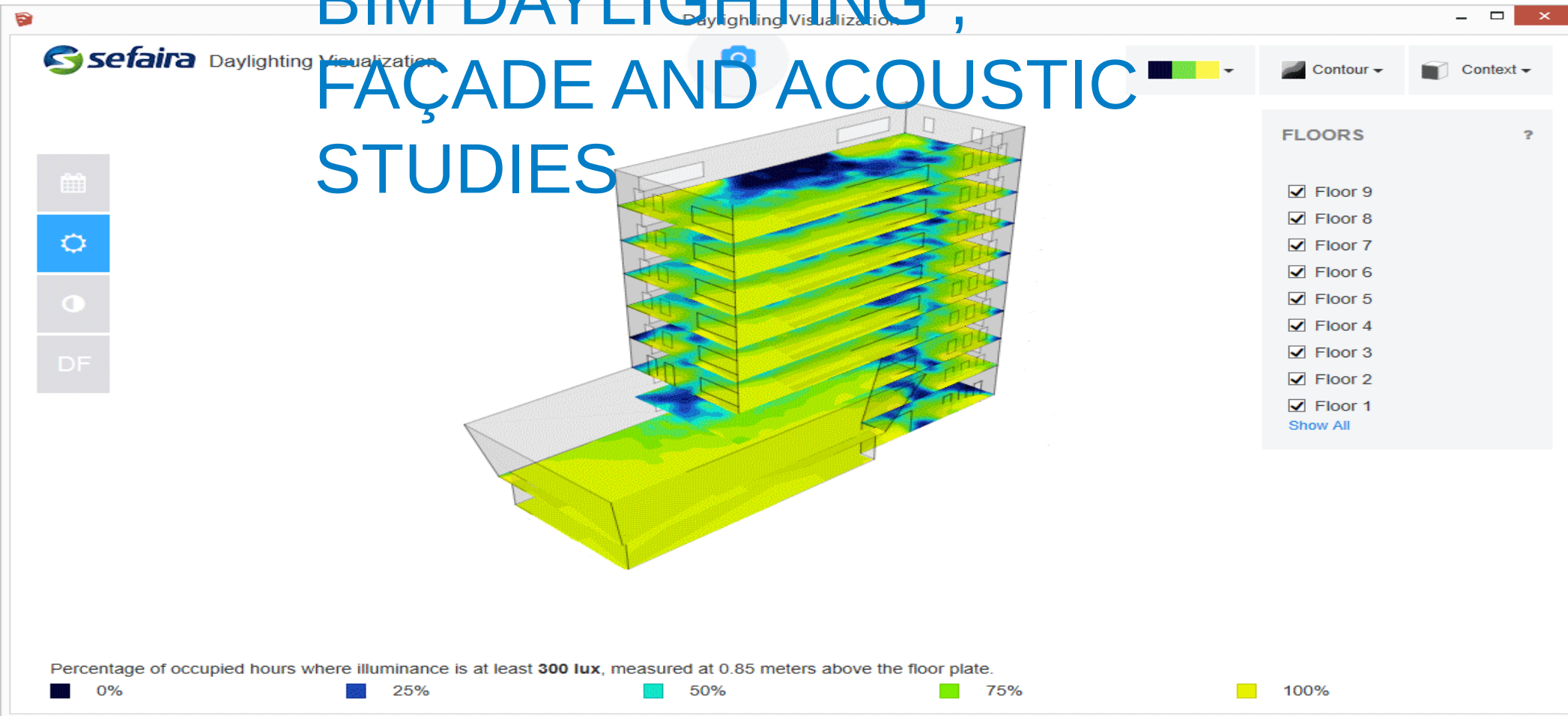


CLIENT WANTED TO
MAKE SURE EVERY
DETAIL IS LOOKED INTO
AND DONE RIGHT

BIM DAYLIGHTING , FAÇADE AND ACOUSTIC STUDIES



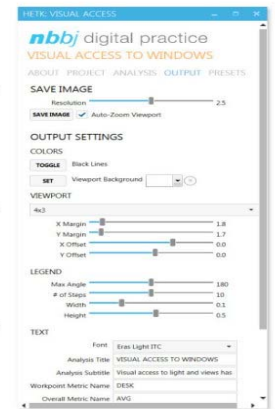
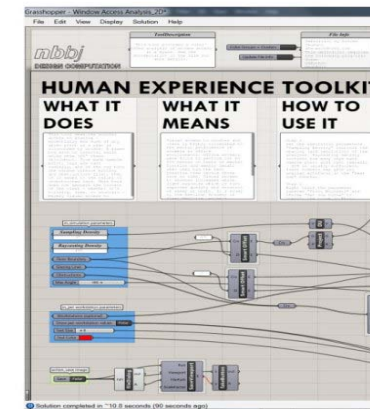
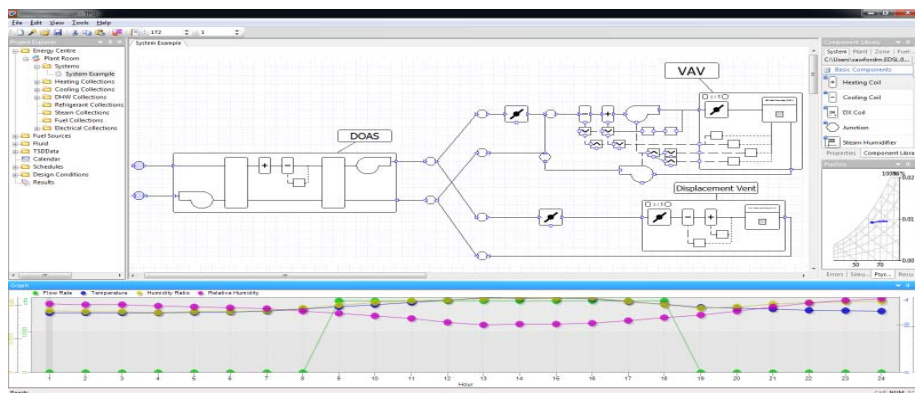
BIM DAYLIGHTING , FAÇADE AND ACOUSTIC STUDIES



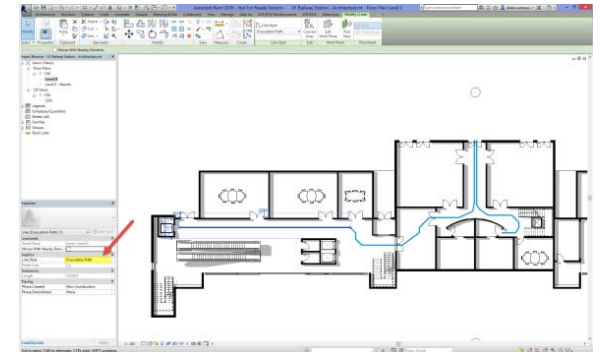
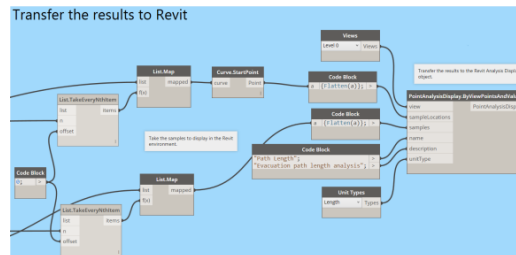
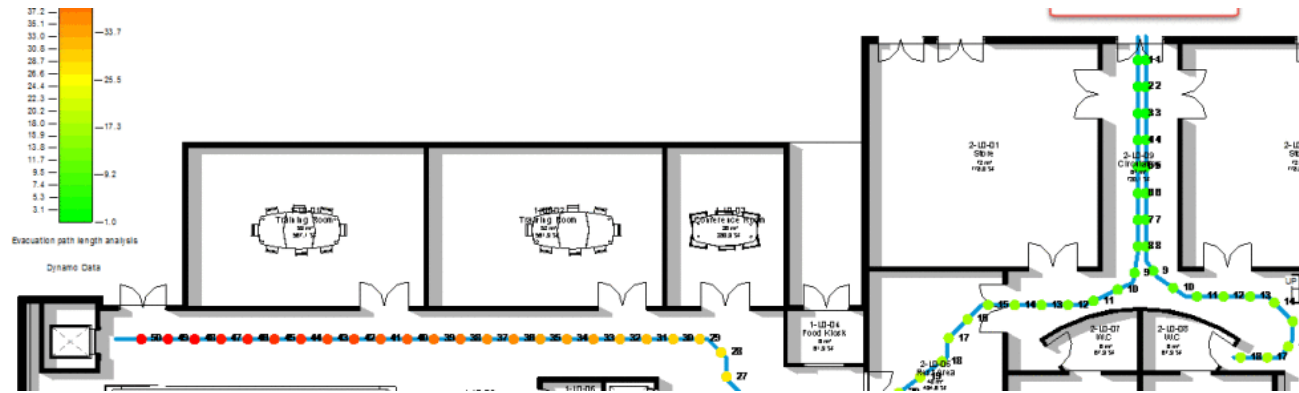
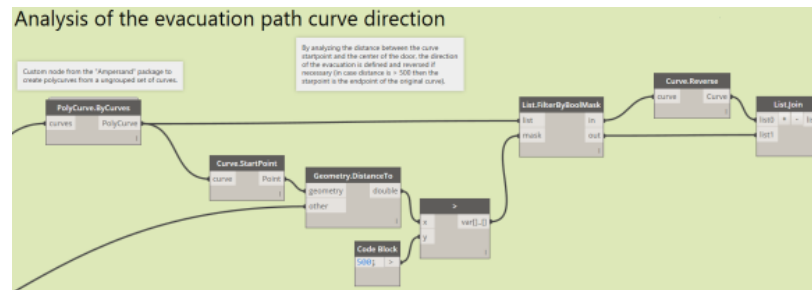
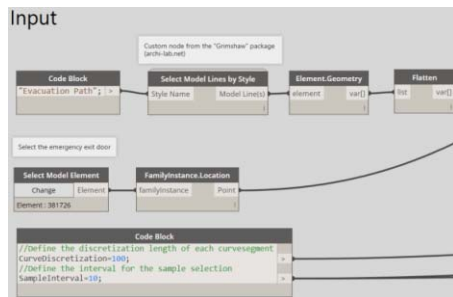
TAS is in the category of comprehensive loads, energy, daylight, comfort and code compliance integrated modules.



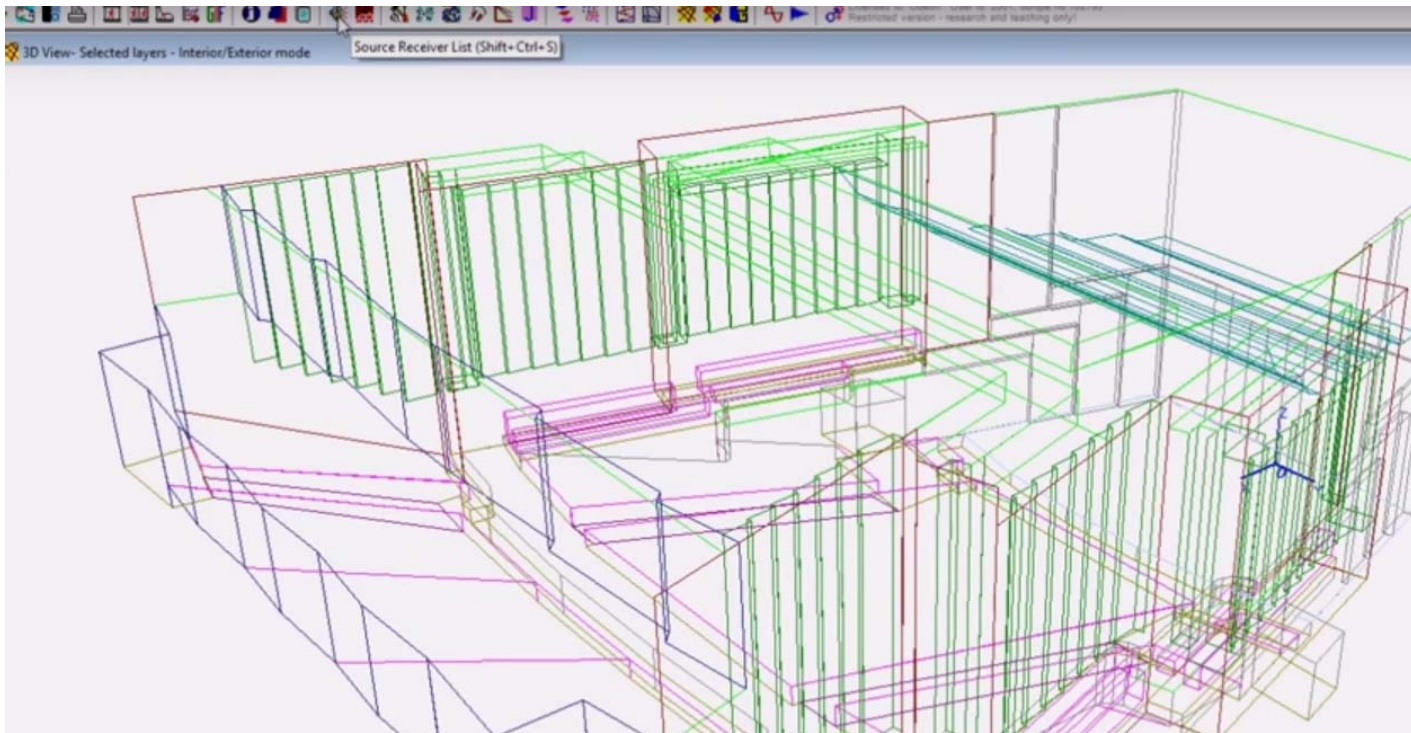
Extensive studies
Were coupled and fed
into the UI
parameterization to
reach Ideal levels for
the end user



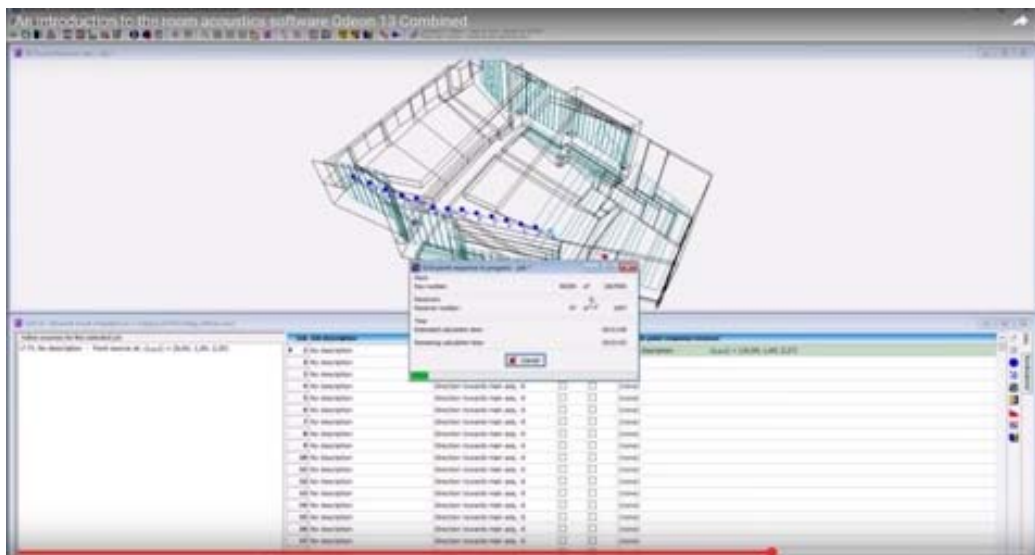
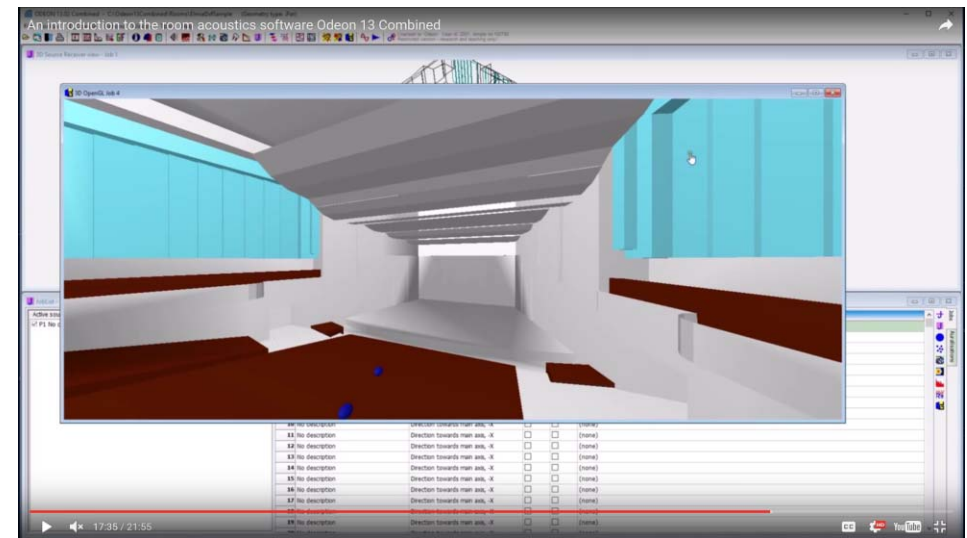
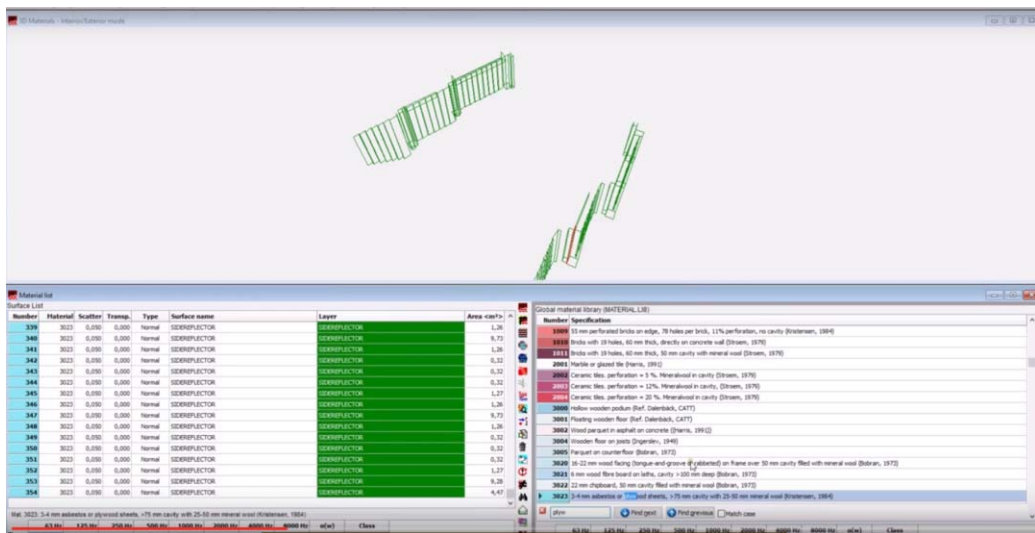
• BIM TRAVEL DISTANCE ANALYSIS



BIM ACOUSTICS



SAS ROOM WAS TAKEN
IN DXF FORMAT TO
ACOUSTIC SOFTWARE
FOR ANALYSIS



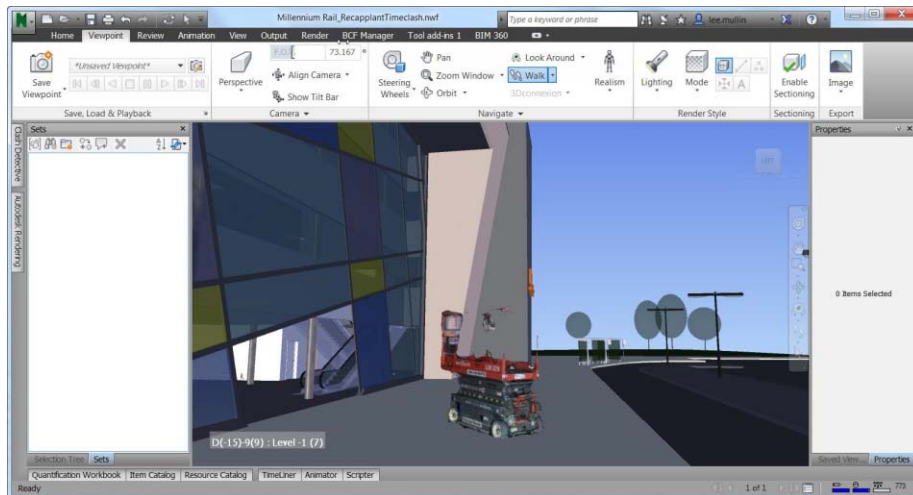
Shkhan

THE ACOUSTIC PLATFORM WAS
INTEGRATED
WITH THE BIM MODEL AND THE
ACOUSTIC
CONSULTANT DID THEIR PART

BIM CONSTRUCTION MANAGEMENT

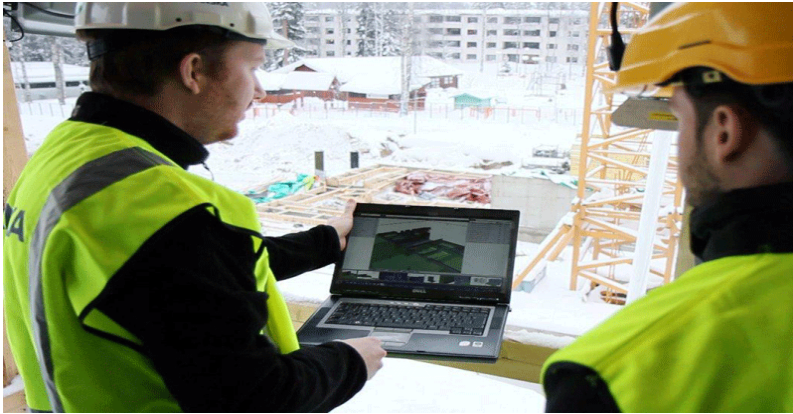


SITE LOGISTICS
PLACEMENT OF VENDOR
OFFICES TRAILERS ADDED TO MSP
SCHEDULE



NAVISWORKS PHOTGRAMMETRY TO
SITE ENGINEERS TO PREPARE THEM TO
AVOID SITE CLASHES AND BE INSTRUMENTS
OF SOLUTIONS

BIM for Construction



BIM Procurement

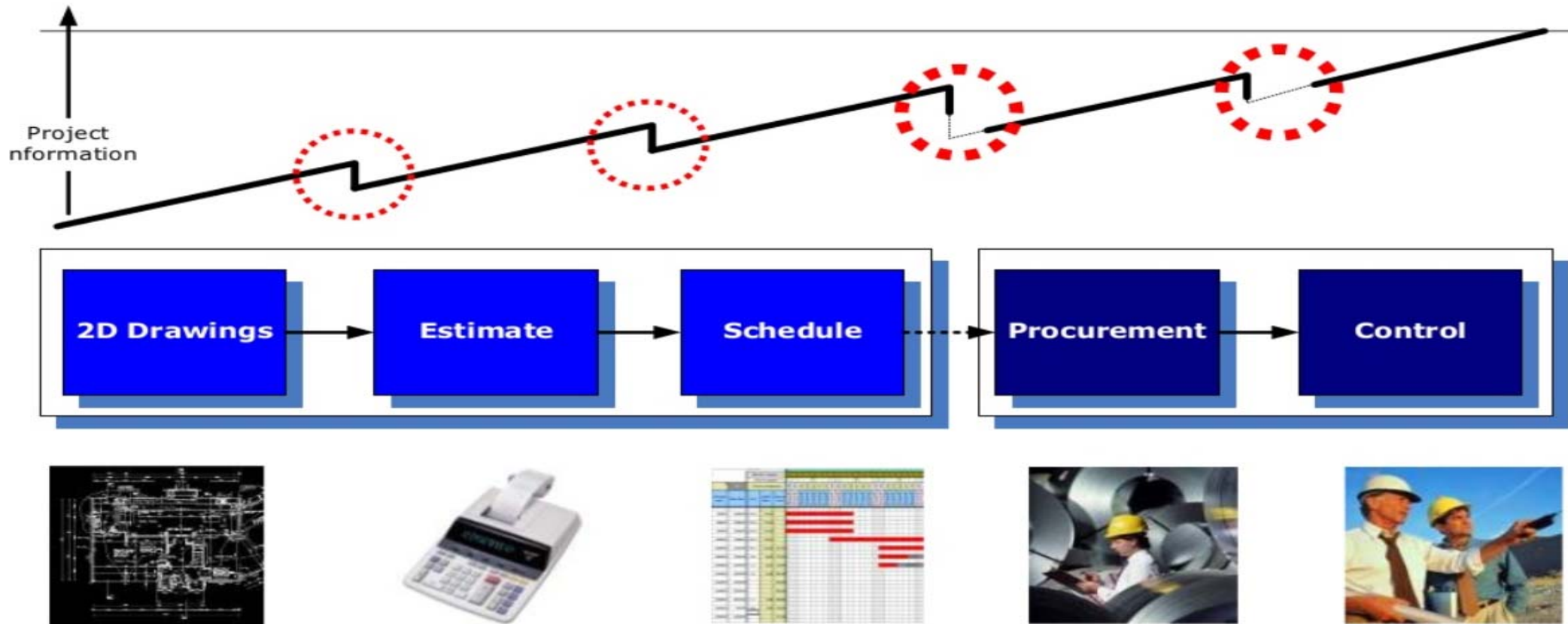
BIM and ERP



THE BEST THING ABOUT LINKING BIM WITH ERP OF CLIENT HELPED US GIVE CLEAR UNDERSTANDING WITH VISIBILITY TO THE US BASED CLIENT. THE ERP ALSO GAVE EASY ACCESS AND CODE COMPLIANCE BASED ON FCPA

BIM Procurement SAP

The Construction Process



BIM IPD HOW WE DID IN ASIA

BIM Standards Skills Matrix

[illegible]

BIM Competency Sets

BIM Competency Sets

the generic basis for developing Capability/Maturity Steps and Areas

Important: this mind map (still under continuous and speedy development) replaces previous published maps named 'BIM Step Types v1.6' and 'BIM Step Types and Key Maturity Areas v2.4'.

BIM Competency Sets v1.1 (Succar, 2009)

Mind Map Legend

- 1 Discovery Granularity Level
- 2 Evaluation Granularity Level
- 3 Certification Granularity Level (not shown)
- 4 Auditing Granularity Level (not shown)

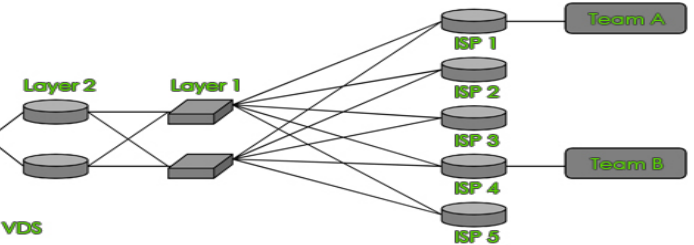
Technology competency sets



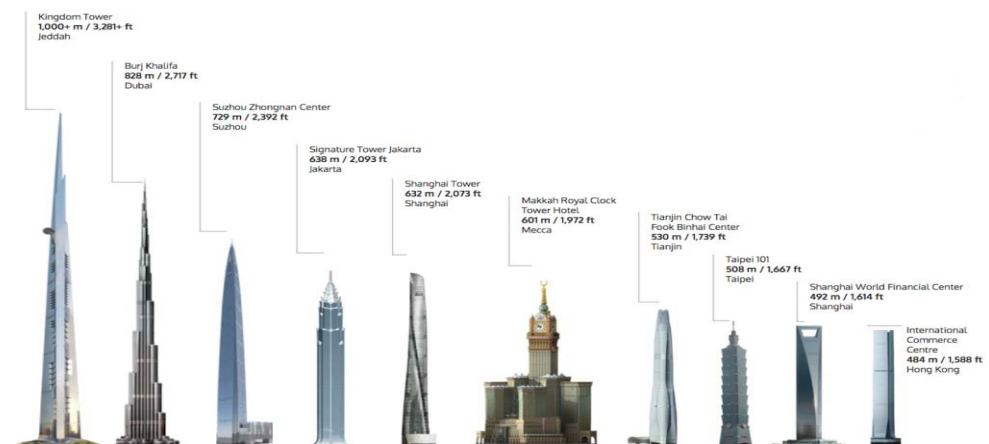
Process competency sets



Policy competency sets



PROJECTS





To achieve the client's goal of a simple and vibrant restaurant design for Sweet Siam, we developed a design infused with elements found in Thai culture. Soft cloth swags weaving in and out of the ceiling's wood slats soften the space and allow for light to diffuse like natural sunlight. Deep-colored woods and colorful features make Sweet Siam a lively, flexible space that easily caters to both a large lunch crowd and more formal, evening diners. The main bar features customizable LED lighting that fades to different colors, enhancing the modern design. Over the course of the project, our team incorporated reuse of the trim, lighting, ceiling grid and tiles into the design in order to help maximize the client's budget.

USA Projects



Located in Kansas City's bustling Power & Light District, the high-profile Cosentino's Downtown Market serves a growing 120,000+ downtown residents and workers. Throughout the project, we coordinated with the architect of record for the larger development and exterior shell, which was being designed simultaneously. A unique challenge this project presented was fitting a full-line grocery store and high-end amenities into half the square footage of a typical supermarket. Our project team was able to expand the store's functional square footage from 30,000 to 36,000 sq. ft. by capitalizing on the space's 22-foot ceilings to incorporate two mezzanine areas and turning unused space under the floors into storage areas. To accommodate for the large glass exteriors, our design solution included window updates that protect products from UV rays and a special ductal system to maintain cool temperatures



USA Projects



FISCHTECK LABS KANSAS CITY MO



HOLIDAY INN KANSAS CITY MO

USA Retail Projects



Toughest Project in BIM



YES A
SHIP

Thank You



謝謝



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