

BIM at Schiphol

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- Asset Management Schiphol (ASM)
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Asset Information (life cycle) Management = BIM

BIM is essentially an value-creating **COLLABORATION**
throughout the entire **LIFE CYCLUS** of an asset,
supported by creating, collecting and **EXCHANGING** shared 3D models
and intelligent objects linked with **STRUCTURED DATA** (information)



Why?

50% of our aviation cost are related to the Assets

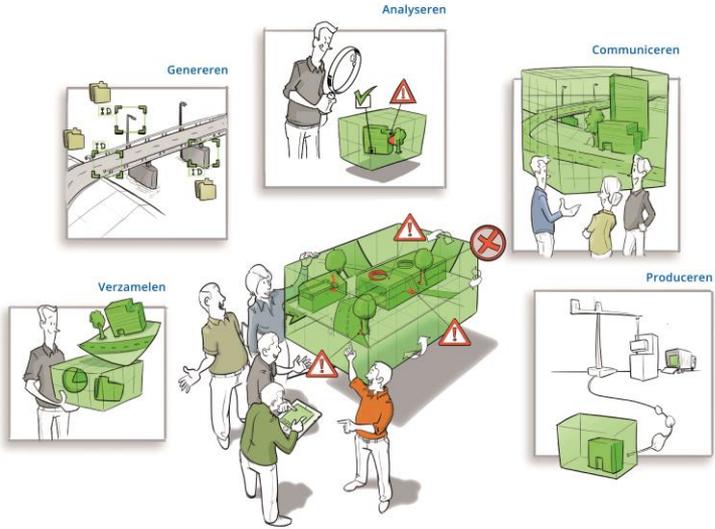
Investments per year
CAPEX: € 400-600 million
OPEX: € 150 million

Estimated Cost reduction during the life cycle

Initiative & Design	+ 5-8 % [^]
realization	- 8-15%
Maintenance	- 5-8 %

Schiphol is “Special” It is a location, a city & a company

Why?



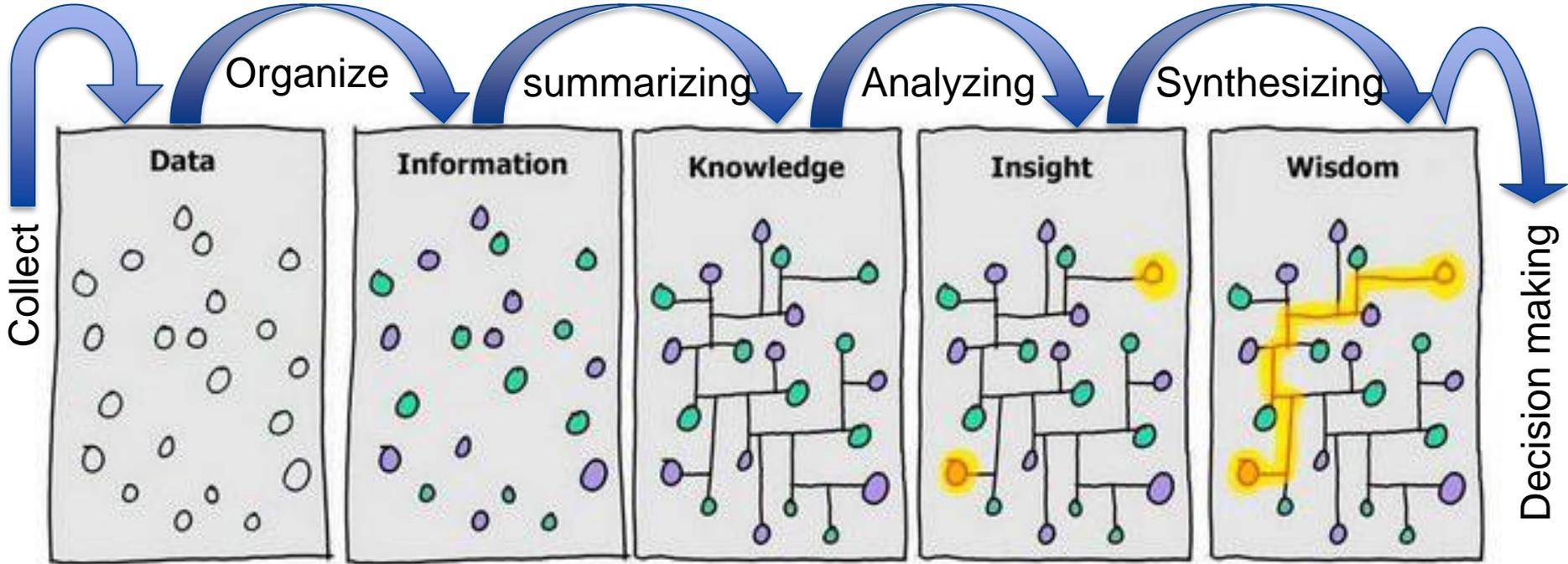
How?

Using openBIM

- We do not want to require or prescribe specific software
 - short shelf life of native files
- Many different parties involved in Asset information life cycle management,
 - with different (design) software
- Use data in various applications.
- Information in each life cycle phase Uniform, consistent and up to date



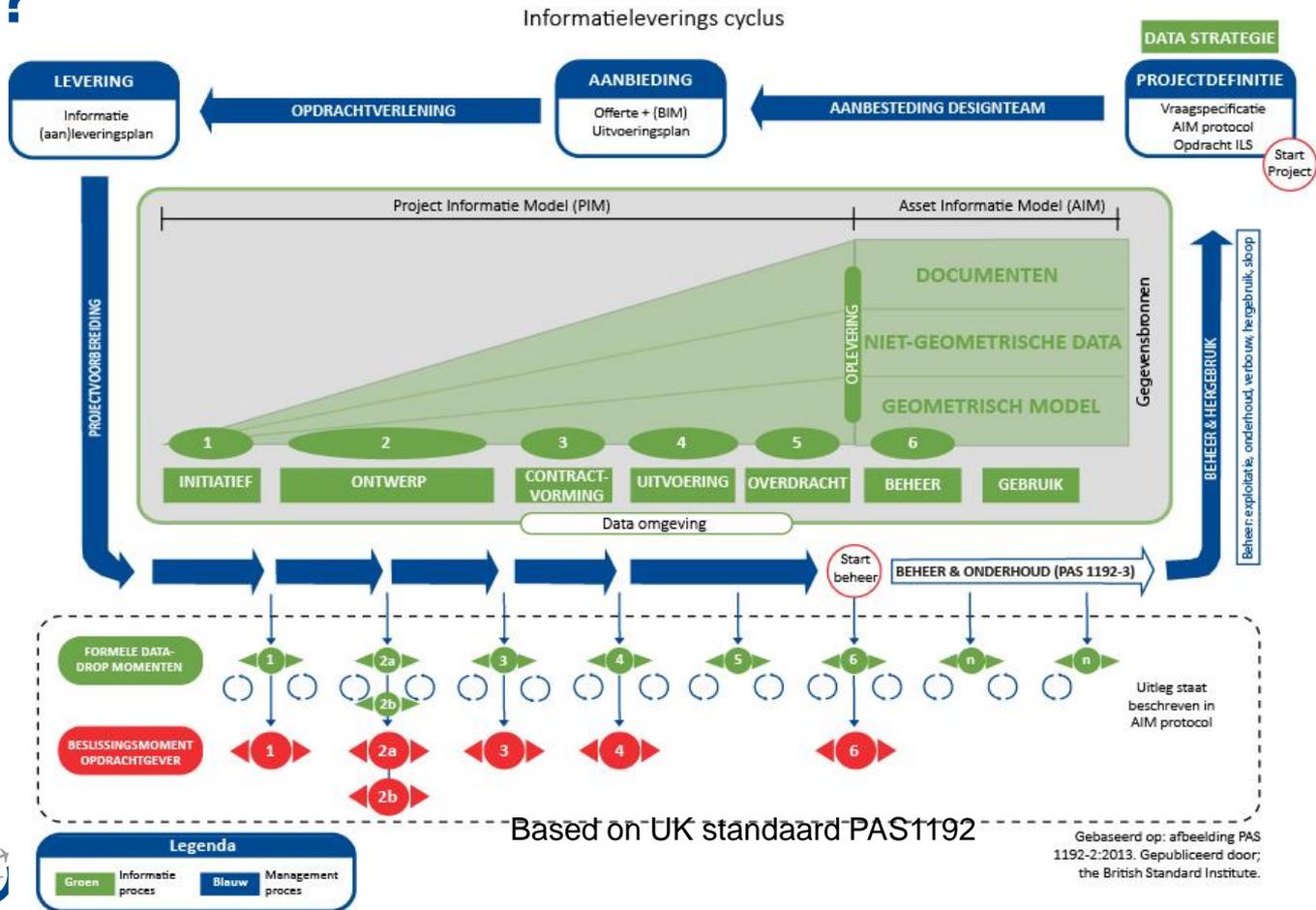
How?



The [DIKW Pyramid](#) revisited by [David Somerville](#) (based on a two pane version by [Hugh MacLeod](#))



What?



What?

Employers Product Requirements

Project definitie

ILS
Eisen aan informatie

AIM
Protocol

Content + structuur

Employers Information Requirements

Clients needs

Contract
(voorwaarden)

Contractors Bid/offers

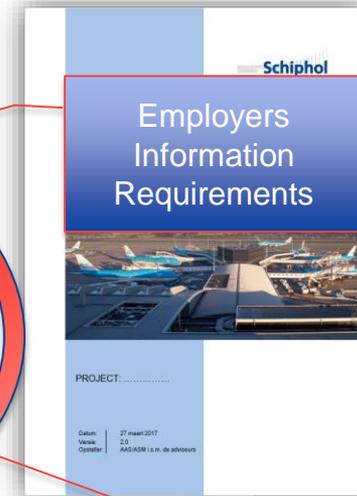
(BIM) informatie producten

(BIM)
Uitvoeringsplan

BIM Product Delivery Plan

BIM Execution Plan

verificatie & validatie



Sharing true Collaborations

1

Schiphol Group
Erasmus MC
Universitair Medisch Centrum Rotterdam
Rijksvastgoedbedrijf
Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

Clients

buildingSMART®
International home of openBIM®
deBIMspecialist
oadis
bim proces adviseurs
BASED | BIM IN PERSPECTIVE
300t
BIM Loket

2

Schiphol Group
buildingSMART®
International home of openBIM®

Airportroom

Heathrow
OSL
ferrovial
Brisbane Airport
Queensland Australia
CPH
AÉROPORTS DE PARIS
VINCI AIRPORTS
Incheon Airport

3

CONSTRUSOFT
TAR

VolkerWessels

4

ENGIE
Maintain

VolkerWessels

5

Bentham Crouwel NACO
DeGrijs
HaskoningDHV
Enhancing Society Together

6

Scan
esri

7

Circularity
MADASTER

Schiphol Group
deBIMspecialist



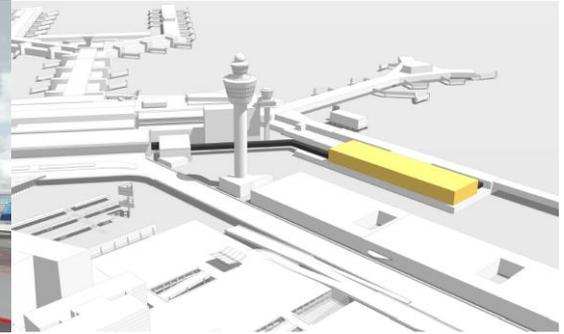
What the AIRPORT ROOM concluded in BCN

- Facilitating guidelines and structure for Use of BIM for Operational Asset Life cycle Management at Airports during all phases, for involved stakeholders
 - Minimize errors during handover data in both construction and FM
 - Conserve data (open BIM)
 - Lowering operational costs

- Including defining technical specifications
 - Creating a framework for Information Delivery Specifications
 - Defining MVD's for Airport Assets, Security
 - Filtering Big data for specific needs in LOD's



Realizing projects together



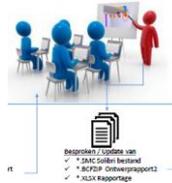
Open BIM Deliverables that we use

IFC



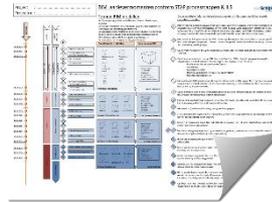
BIM model -
Information
Exchange
using IFC 4.0
or IFC2x3

BCF



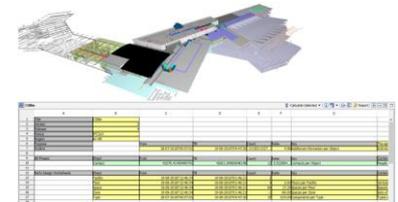
Collaboration -
Communication
using BCF
(see next slide)

IDM



IDM methodology
and principles
used in developed
ILS and BIM
protocol

COBie



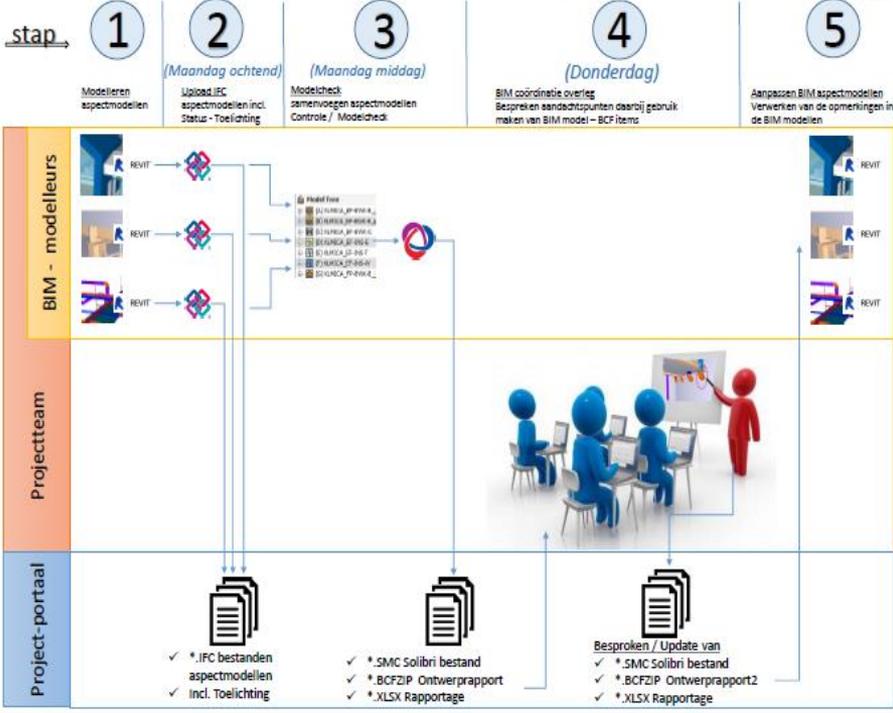
Current research -
COBie as dataset -
handover design,
construction →
Facility Management



Colabrate with open Standards (IFC, BCF)

Proces BIM coördinatie

Schiphol
Amsterdam Airport



Toelichting BIM coördinatie

Schiphol
Amsterdam Airport

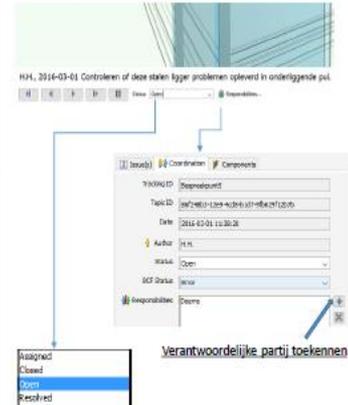
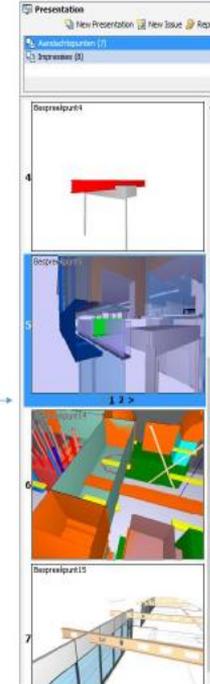
- 4** BIM coördinatie overleg
Bespreken aandachtspunten daarbij gebruik maken van BIM model – BCF items



Toelichting - Tips

- Bespreek de constatering met hoge prio eerst
- Ken per item een verantwoordelijke toe
- Ken per item een status toe
- Maak zoveel als mogelijk gebruik van BIM model
- Sla de opmerkingen op per item
- Gebruik eventueel meerdere slides per item
- Download de gratis Solibri viewer <http://www.solibri.com/products/solibri-model-viewer/>
- Maak eventueel gebruik van BCF plug-in voor Revit <http://bcfier.com/>
- Maak gebruik van Mark-up tool
- Opgeloste items als Closed door BIM coordinator opslaan

BCF staat voor BIM Collaboration Format meer info: <http://www.buildingsmart-tech.org/specifications/bcf-releasas>

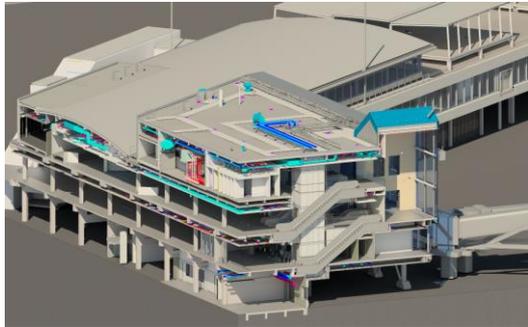


- Status toekening per item
- a) Open = (default) nog te bespreken
 - b) Assigned = toegewezen aan specifieke partij
 - c) Resolved = opgelost door modelleur
 - d) Closed = afgesloten (door BIM coordinator)



Project KLM ICA lounge

Design



Realization

Ballast Nedam Building Projects

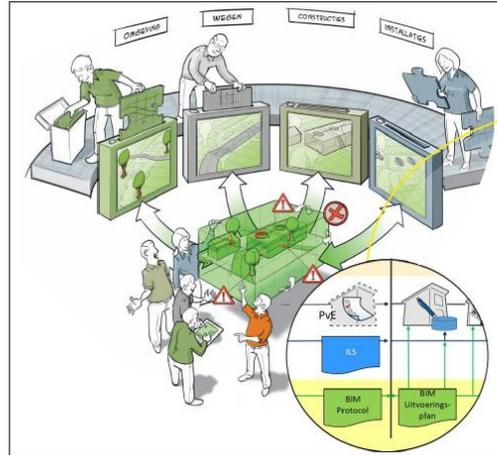


Projectnummer 307.004

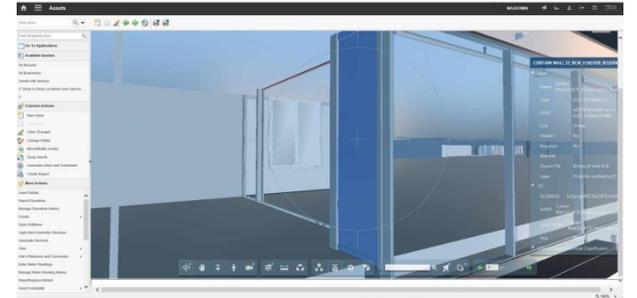
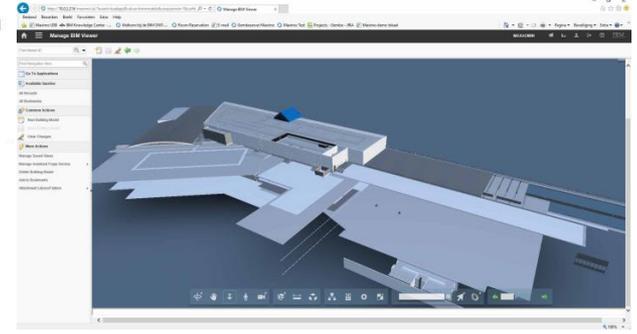
Projectnummer AAS 1006779

BIM Execution plan

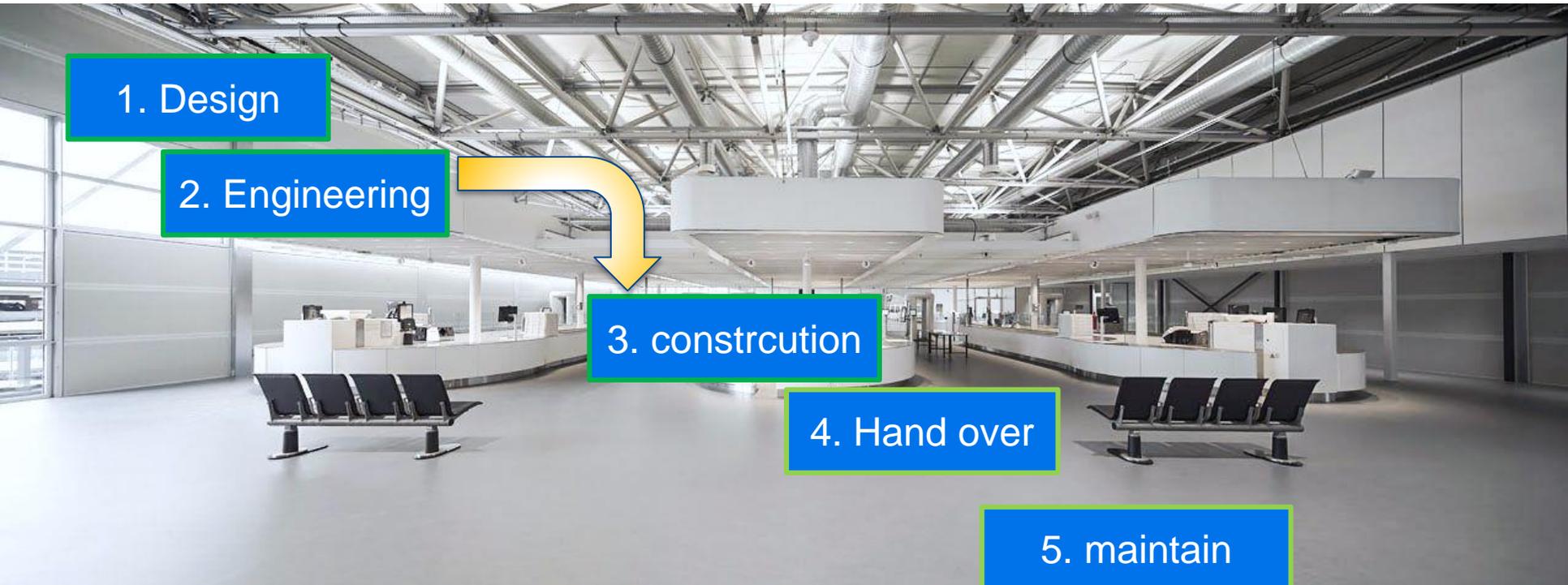
KLM ICA Lounge Schiphol



Maintain

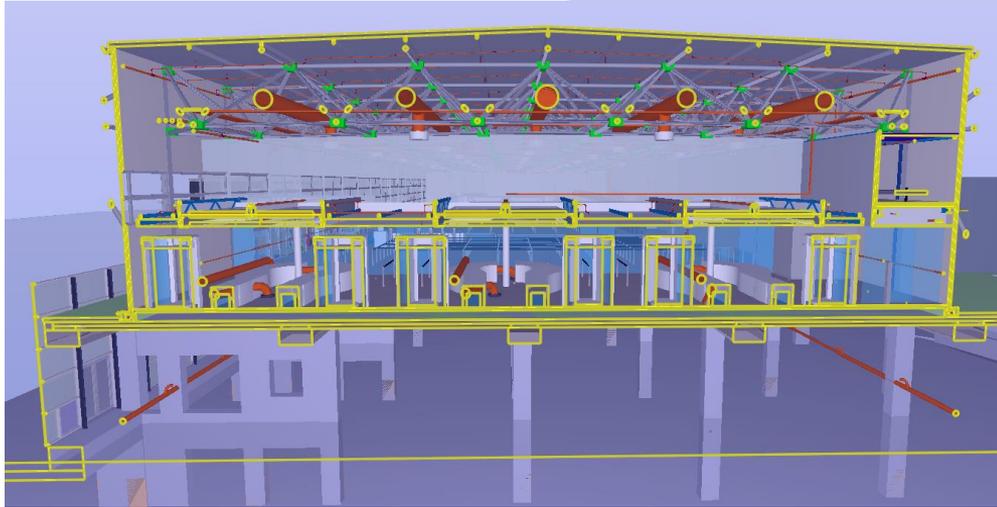
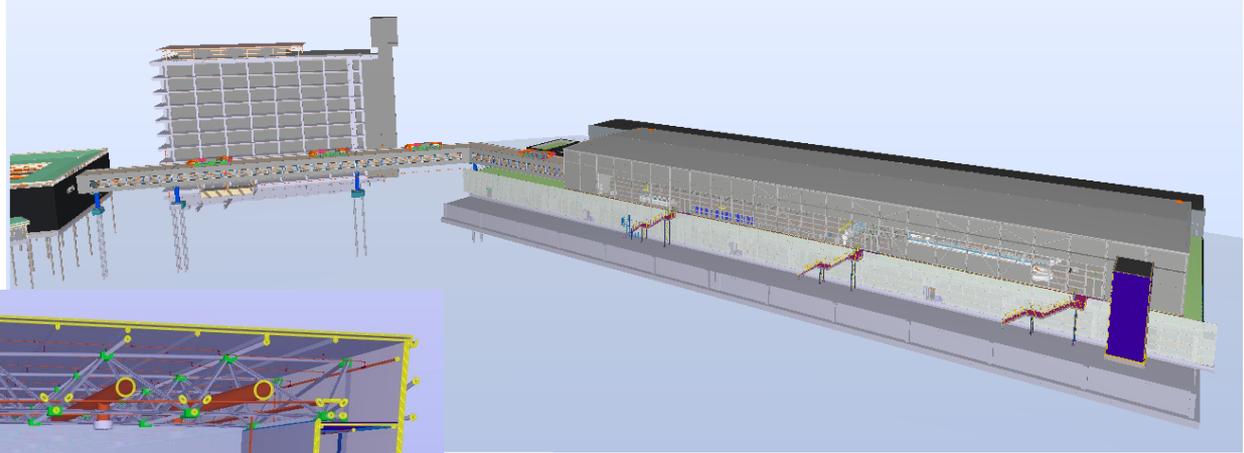


Lessons learned



Departure hall

2 months design



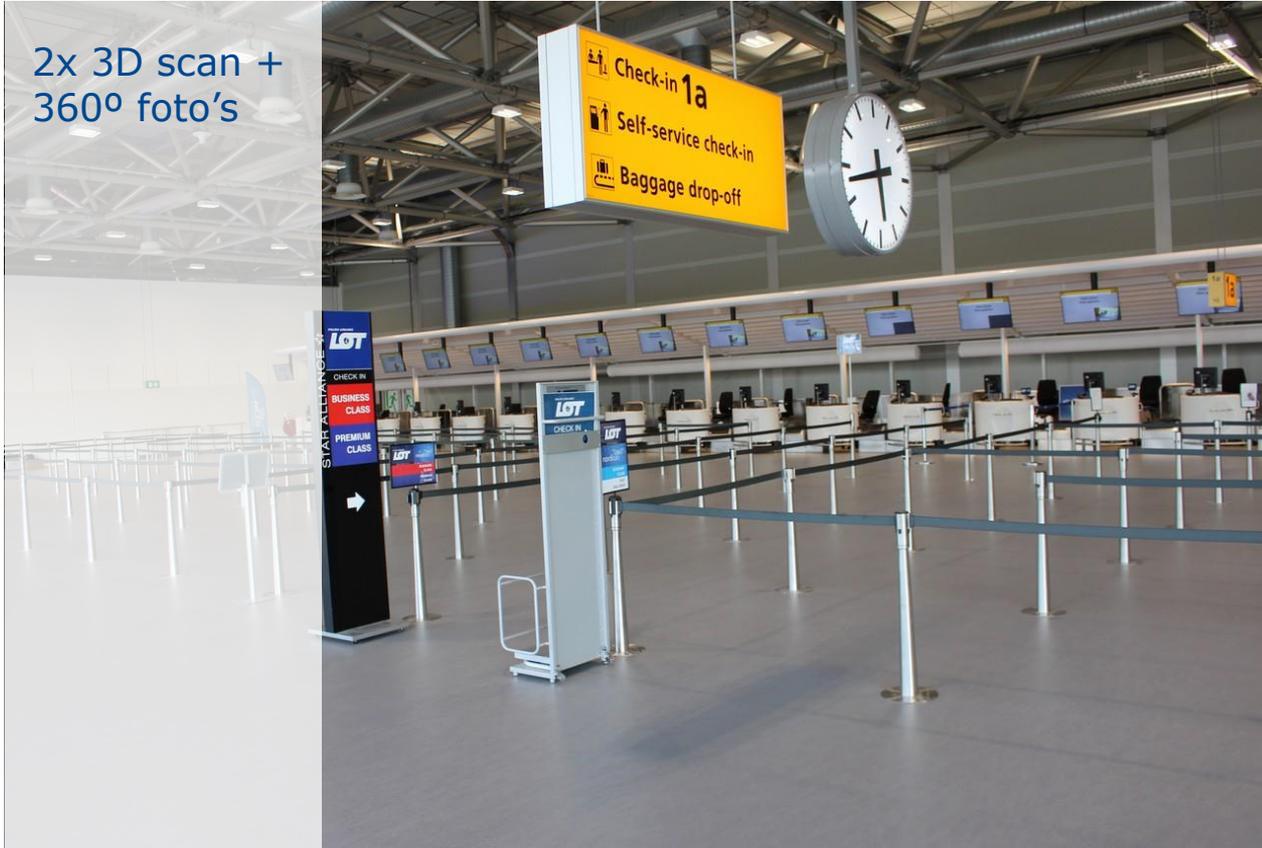
5 months
realisation

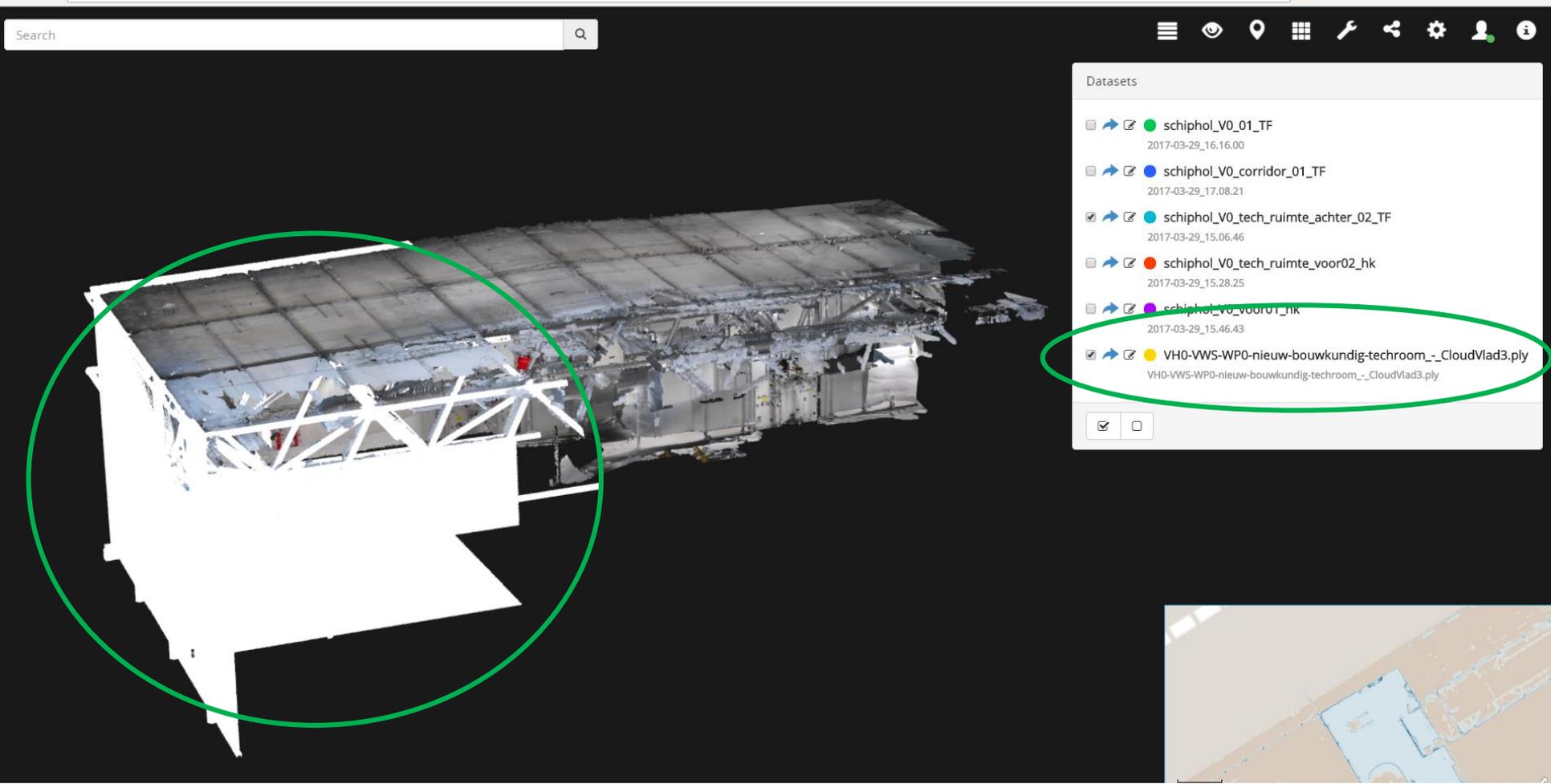
Lessons learned



Validation AS-build vs Model

2x 3D scan +
360° foto's





Part off IFC model (white) imported into IndoorViewer

Search



↑
schiphol_V0_01_TF
↓

Ceiling higher then designed in IFC model

IFC model (wit) vergelijk met Point Cloud

5 m

NavVis, © Mapbox, © OpenStreetMap

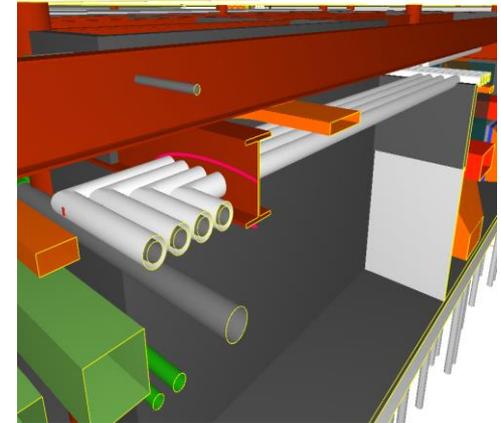
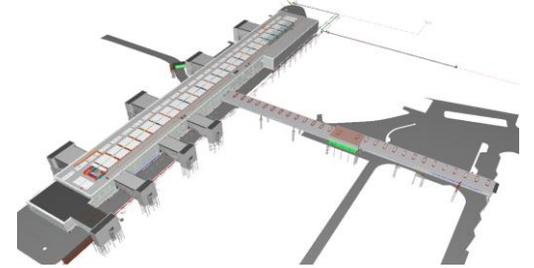
New Pier

Execution plan

Verify and validate the design using BCF

A-pier BIM Modelcheck issues Preliminary Design

Modelcheck	Issue	Severity	Resolution	Status	Completion	
1	Missing: 0	0	18-Jun-2011	07-pier not correct, also wrongly indicated objects	Open	X: 111,960,423 mm Y: 476,794,137 mm Z: 79,310 mm
2	Missing: 0	0	18-Jun-2011	07-pier not correct, also wrongly indicated objects	Open	X: 111,960,423 mm Y: 476,794,137 mm Z: 79,310 mm
3	Missing: 0	0	18-Jun-2011	07-pier not correct, also wrongly indicated objects	Open	X: 111,960,423 mm Y: 476,794,137 mm Z: 79,310 mm



Preliminary Design

Volume 4: Project Management

Organisation
4.2.3 Plan Approach to BIM

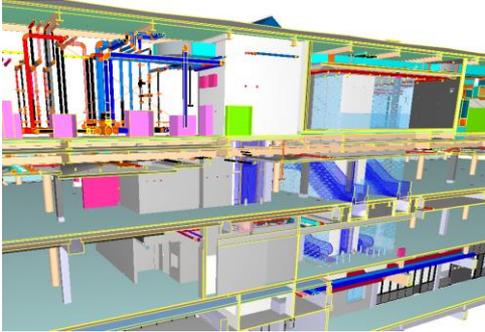
XXXX-C1000-00-ACM-MAN_002-0001

AECOM
cepezed

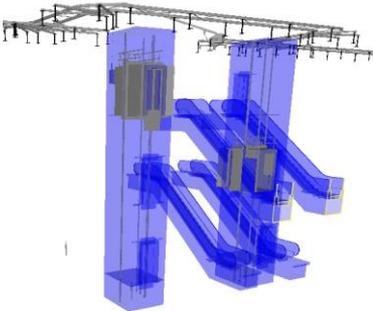


Benefits

1) Better and faster understanding of complex situations



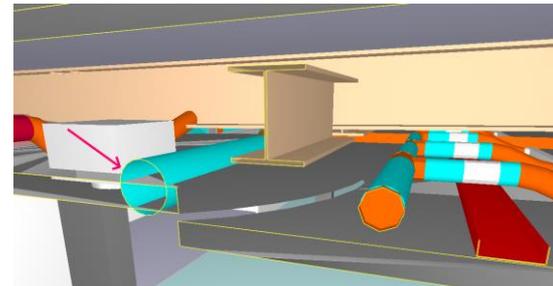
2) Better coordination between various parties through clear demarcation



3) More efficient through process including through reuse of information in various phases



4) Risk limitation through better insight, simulation, clash detection



Conclusion

- Need for uniform **International** Information Requirements
- OpenBIM – IFC, BCF Exchange WORKS!
- Clear agreements are very important (BIM protocol, BIM Execution plan)
- Quality of Employers Information Requirements (EIR) is essential!
- Being Compliant to EIR by engineers and construction companies is essential; “almost good = fatal”



Coming together
is a beginning;
keeping together
is progress;
working together
is success.

Henry Ford

janifer wickes | StudyBU

"I have never
tried that before,
so I think I
should definitely
be able to do
that."

- Pippi Longstocking

Muchas Gracias

