20. april 2012

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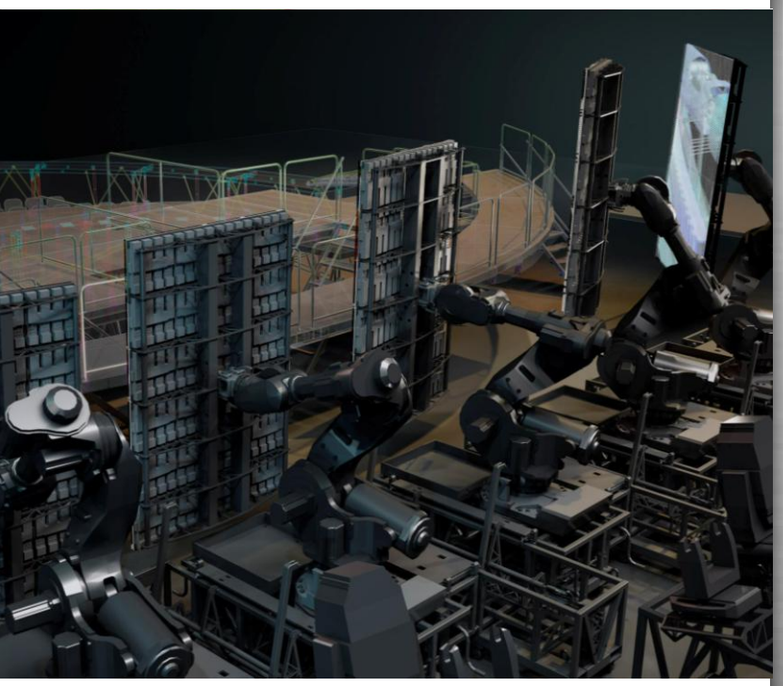
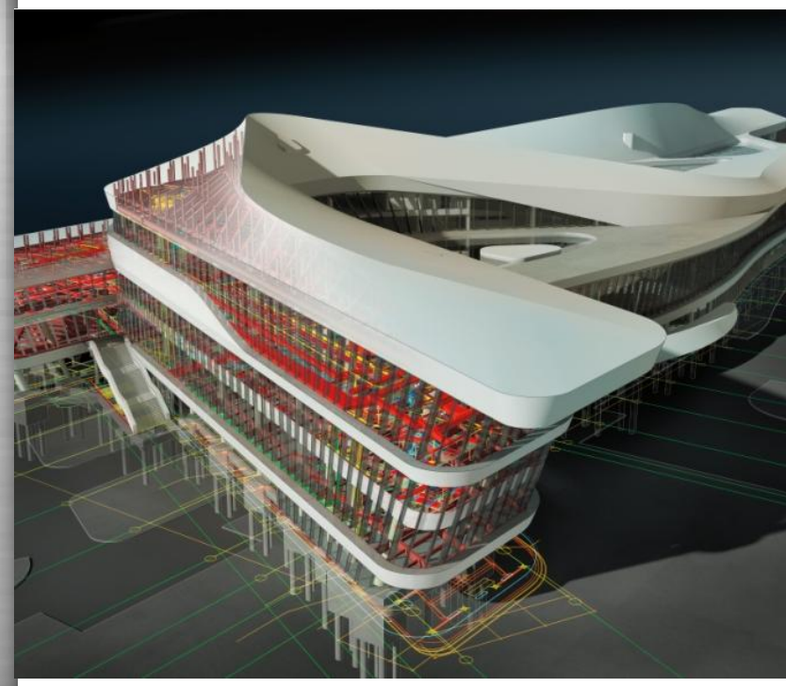


BIM & STANDARDS

Betech Data

Michael Schwartz



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Overview

- Definition of BIM
- BIM Means Business
- Challenges, Changes and Methodology
- IFC & BIM Requirements
- Questions

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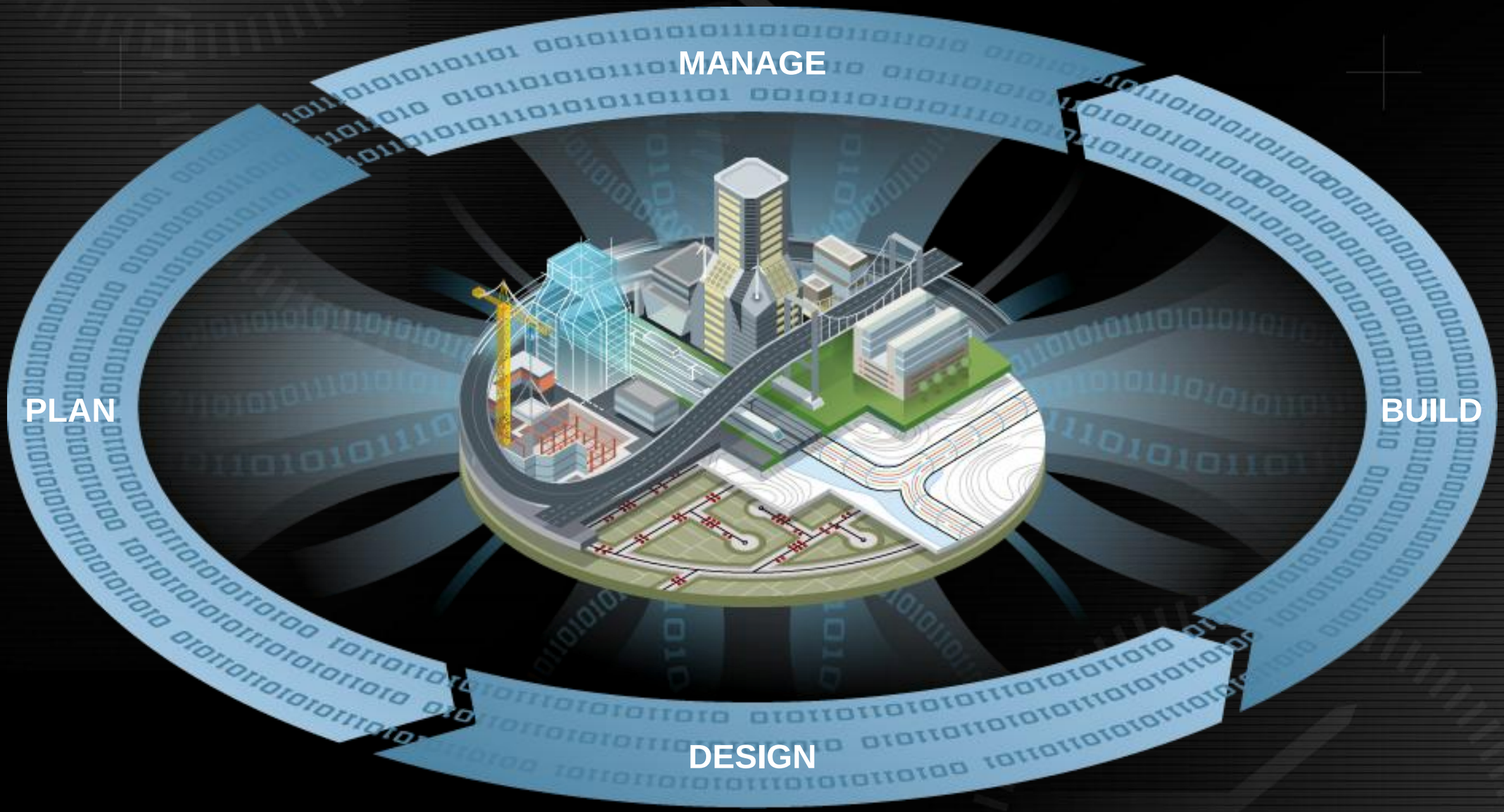
Definition of BIM



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Definitiion of BIM

- Definition of BIM
- **BIM Means Business**
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- Questions

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BIM Means Business!

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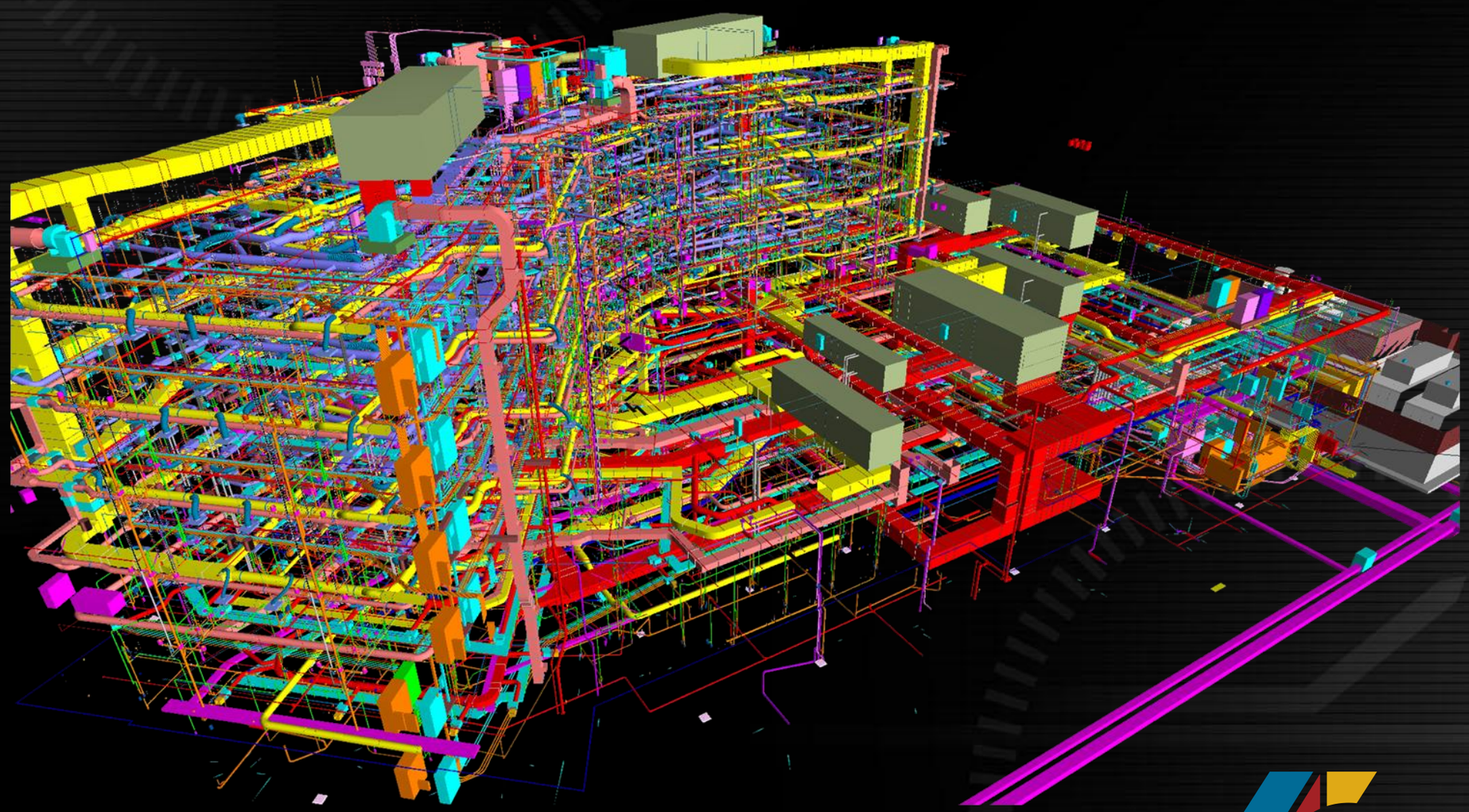
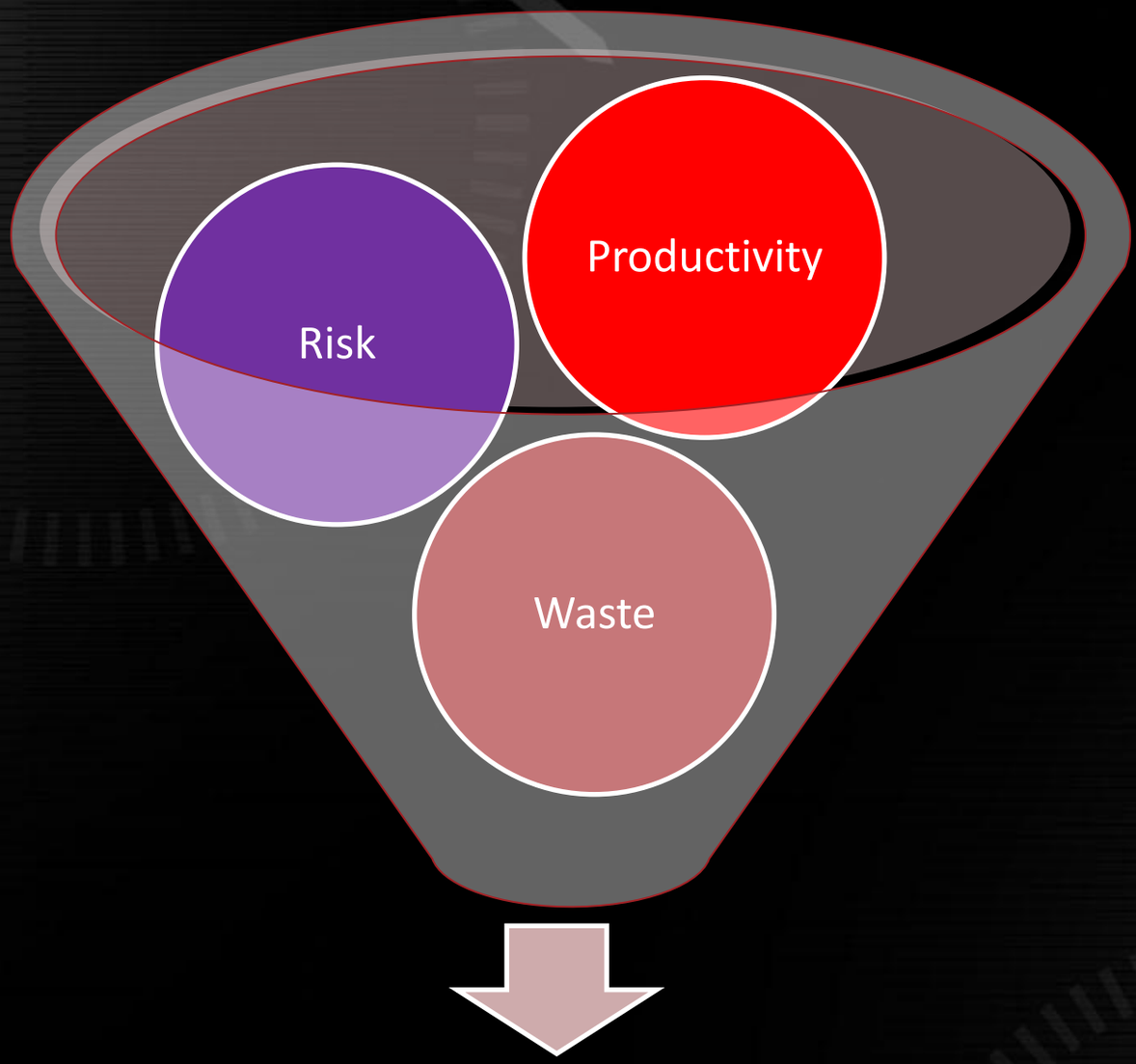
Introduction and Expectations

- BIM is about business decisions not technical decisions
- Structured, organized & exchangeable information is what is vital
- Economics now mandate industry transformation
- New contractual relationships based on shared responsibility



Key Business Drivers for BIM Adoption by Builders



BIM Leadership

Reasons for BIM Adoption

- Risk
- Waste
- Improve Productivity
- Quality
- Communication
- Construction Engineering
- Coordination
- Improved Accuracy
- Industry Image
- Profitability

Risk Impacts

Where is Your Risk Coming From ?

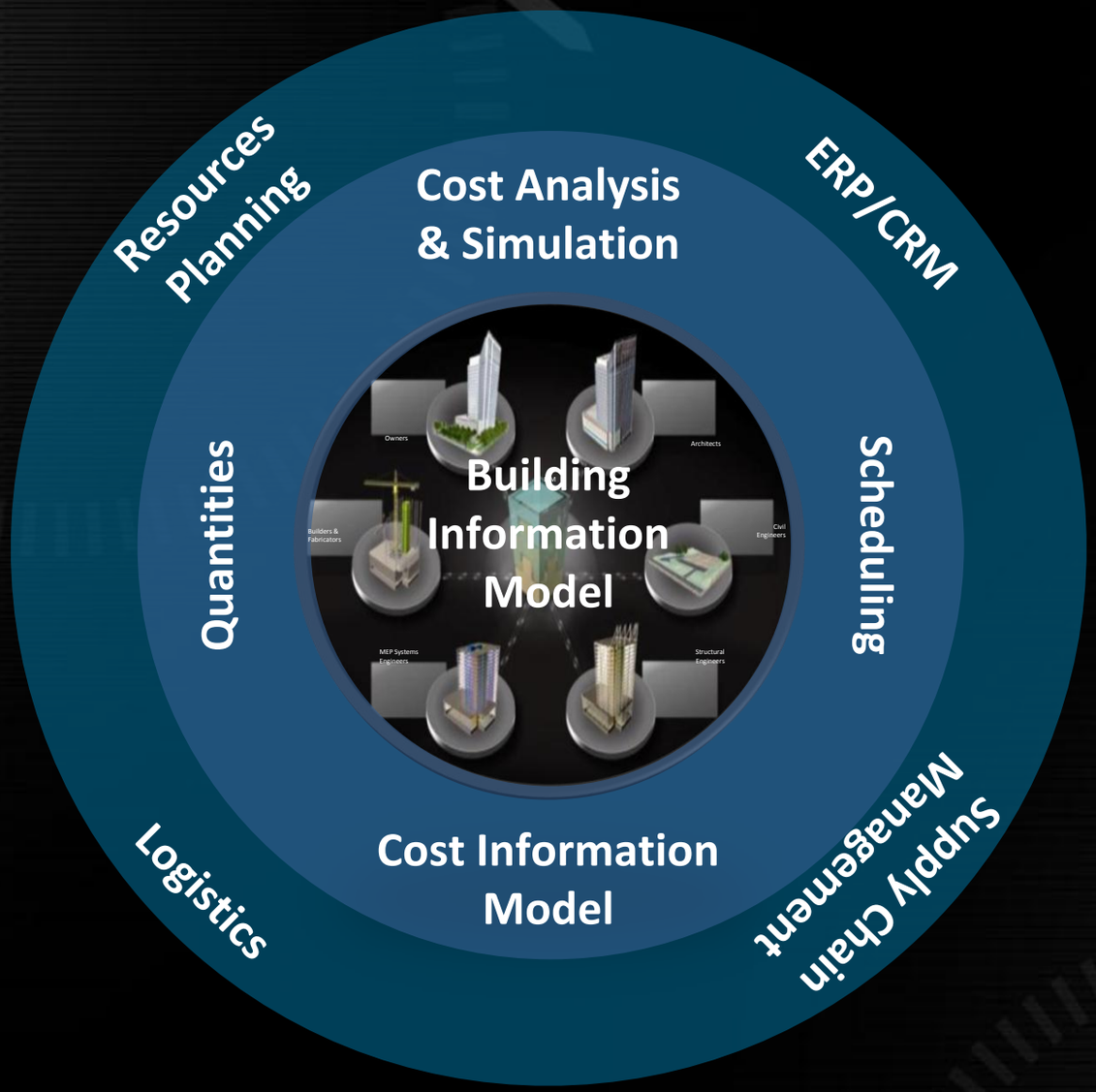
Manage Cost *"Financial Modelling"*

- Increased Complexity of Cost Structure
- Rapid Change of Cost and Risk
- Cost Estimators Requires:
  - Project Transparency and Visibility
  - Reliability and Flexibility
  - **Integration** and Quality
  - Ability to Combine Items and Quantities Into Cost Objects
  - **Modelling** Capability

Manage Risk

- Uncertainty in financial markets, credit risk Requires Increased focus on Risk and Cost Management
- Impacting factors
  - Project failures
  - Legal liabilities
  - Accidents
  - Increased Competition (Globalisation)
  - Identify risk and ..
  - Transferring risk to another party, supply chain etc.
- Reinforced and documented decissions
- Better understanding of how decissions impact the projects economy, logistics, resources, time etc.

Integrated Business Information Model



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BIM Means Business

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BIM Processes – Challenge existing process

Reduce the steps, reduce the time, increase the ROI

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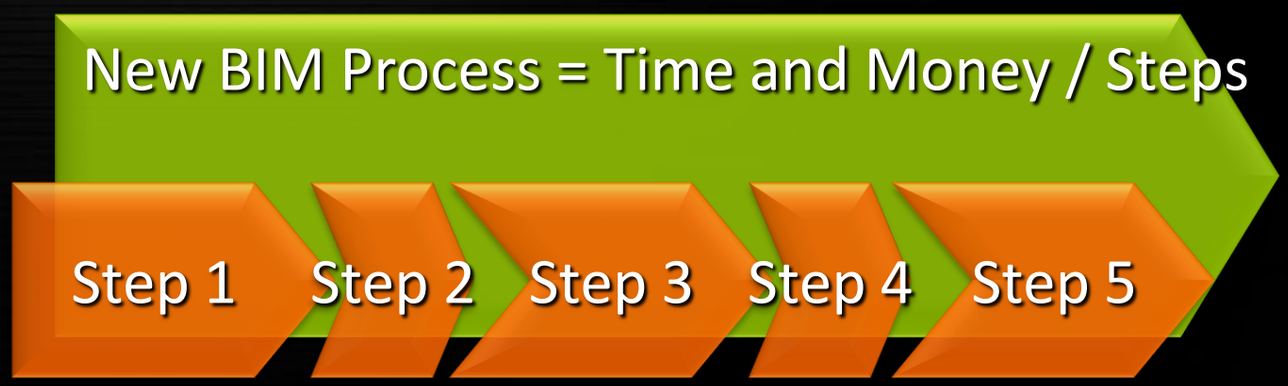

- Eliminate steps
- Reduce cycle times
- Streamline processes
- Increase productivity
- Save money

- Time and Money Savings = N Optimized Process x N Projects

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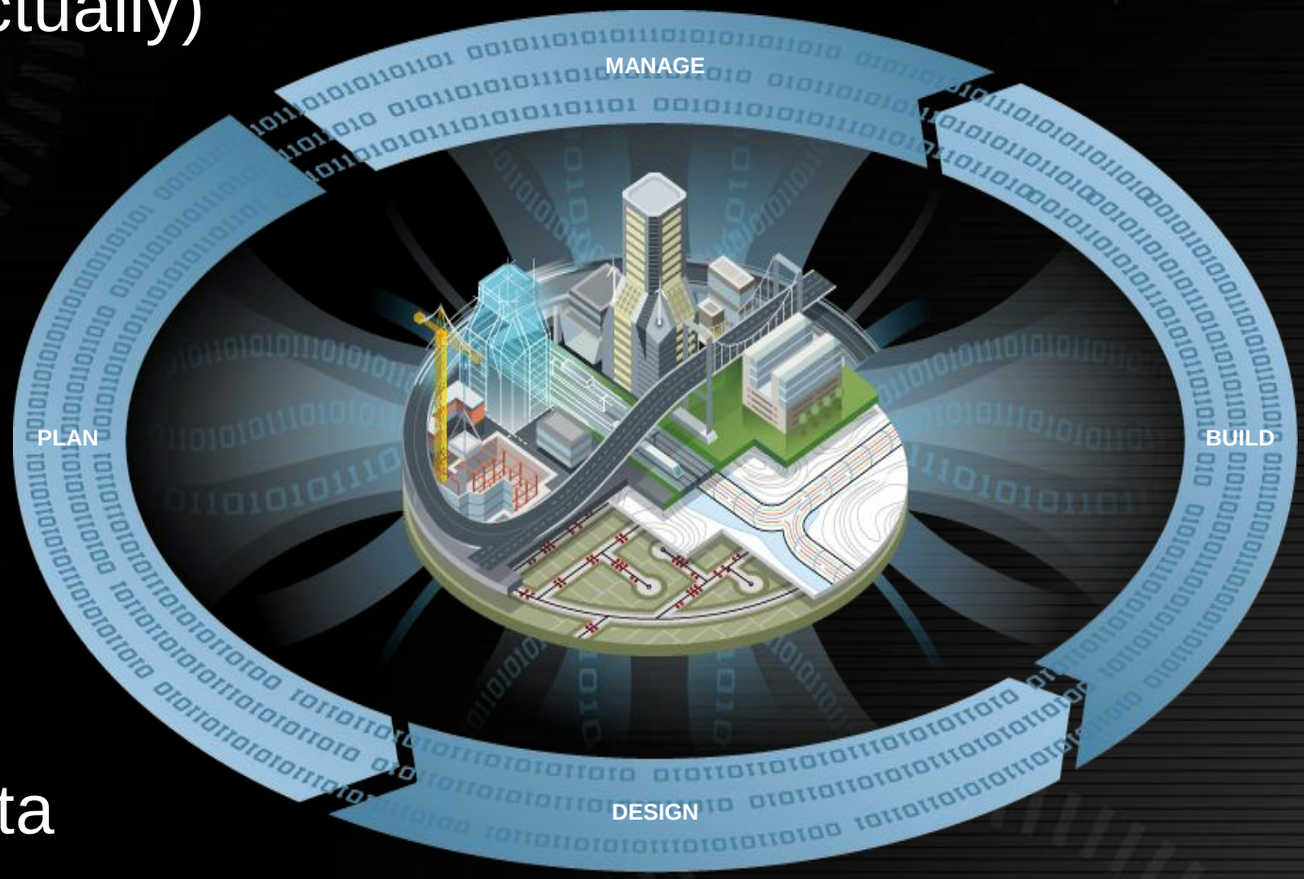
Challenges, Change & Methodology

- Do not automate a bad process
- Focus on value
- Understand you business environment
- Understand you business systems
- Understand your cross-functional relationships
- Do not just focus on a few tasks look at the entire enterprise

Challenges, Change & Methodology

BIM Process Characteristics

- Integrated Practice (Contractually)
- Shared responsibility (Contractually)
- Lean Process
- Geometry (primarily 3D)
- Collaboration
- Value
- Efficiency
- Certainty
- Shared, Organized & Rich Data
- Information & Shared data
- Early decision making



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IFC & BIM Requirements

- Definition of BIM
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- Challenges, Changes and Methodology
- **IFC & BIM Requirements**
- Questions

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Washington, DC
January 18, 2008

BETECH DATA

Statement of Intention to support BIM with Open Standards

Open Building Information Modeling (BIM) object-oriented standards are an important aspect of this strategy, enabling the exchange of interoperable digital data supporting different representations of the building processes and the built environment in which they reside. This digital representation may include 3D geometry, 4D phasing (3D space + time), 5D costing (4D + cost), as well as spatial information, geographic information, and properties of building components and elements.

Industry Foundation Classes (IFCs) from the International Alliance for Interoperability (IAI) are recognized as a leading example of an open, freely-available, BIM standard specification for sharing data throughout the life cycle across multiple professional disciplines and technical applications in the AEC/FM sector.

The signatories–designated "we" in this public statement–have a common interest in supporting the continuing development and implementation of open BIM standards such as the IFCs. In pursuit of this, we intend to support IFCs as an open BIM standard in the following areas:

Within established budget limits, quality goals, and defined project progress, we will initiate and participate in open BIM-related research, development, and collaboration efforts, including making accessible our own building construction projects for piloting, thus contributing to the gradual proliferation and use of open digital building information models with IFCs throughout the lifespan of building structures.

We will support, to the extent legally and practically possible, the use of IFC-related BIM solutions in public construction works.

Our intent is for all major projects to use open BIMs based on IFCs on a regular basis but no later than within a two- to four-year (i.e., 2009-2011) timeframe.

We also intend to observe and assess the continuing development of relevant accompanying open BIM-related standards like the International Framework for Dictionaries (IFD) and the emerging Information Delivery Manual (IDM) and Model View Definitions (MVD) approach to describe and display the information required for the design, construction, and operation of constructed facilities and the interfacing of GIS (Geographic Information Systems)-related open standards.

Statement of Intention to support BIM with Open Standards

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Senate
PROPERTIES

DANISH ENTERPRISE AND CONSTRUCTION AUTHORITY

STATSBYGG

Rijksgebouwendienst
Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

GSA U.S. General Services Administration

BETECH DATA

Senate

PROPERTIES

Wind Turbine design based on QuietRevolution.

BETECH DATA

Senaatti-kiinteistöt ~ Senate Properties

- Senate Properties is a government owned enterprise under the aegis of the Finnish Ministry of Finance and is responsible for managing the Finnish state`s property assets and for letting premises.
- Senate Properties provides services related to premises, primarily to customers which form part of the state administration.
- The services include leasing premises, investments, and the administration and development of the property portfolio.
- As a business enterprise, Senate Properties finances its own operations and is not dependent on the state budget. The building stock comprises university, office, research, cultural and other buildings.

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Senaatti-kiinteistöt ~ Senate Properties

Senate Properties 2010

- 11 700 buildings
- 6.6 million m²
- Turnover € 501 million
- Property assets valued at € 5.2 billion
- 271 property professionals

Senaatti
KIINTEISTÖT

Senate
PROPERTIES

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Senaatti-kiinteistöt ~ Senate Properties

BIM Guidelines

- Senate Properties will draw up detailed modeling guidelines by 1 September 2007.
- The guidelines will specify the data content requirements for models to the participants in the project at each stage of the design.
- The guidelines will comply with the main lines specified in the ProIT project, applied to decisions to be made in Senate Properties' investment process. In the first phase, all design software packages which have passed IFC 2x3 certification may be used for modeling.

Source: http://www.senaatti.fi/document.asp?siteID=2&docID=517

BETECH DATA

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Senaatti-kiinteistöt ~ Senate Properties

BIM Guidelines
Volume 1: General Part

4 General modeling requirements

4.1 Software to be used

The use of all IFC2x3 certified modeling software is allowed. The use of IFC2x2 certified software may be agreed upon on a project-specific basis with the consent of Senate Properties if a software application that supports the newer version is

Source: http://www.senaatti.com/document.asp?siteID=2&docID=588

BETECH DATA

DANISH ENTERPRISE AND CONSTRUCTION AUTHORITY

BETECH DATA

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Erhvervs og Byggestyrelsen
Danish Enterprise and Construction Authority

Danish Enterprise and Construction Authority is broadly responsible for enterprise and construction policy. DEACA's job is to develop a competitive, market-based growth environment for companies. DEACA accomplish this in cooperation with the corporate sector, business associations and other public sector actors.

ERHVERVS- OG BYGGESTYRELSEN

DANISH ENTERPRISE AND CONSTRUCTION AUTHORITY

Has changed departments and names with the new Government

BETECH DATA

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Erhvervs og Byggestyrelsen
Danish Enterprise and Construction Authority

As a part of the Danish government's initiative "Digital Construction", public building owners have since January 2007 been obligated to put forward certain requirements that private companies must fulfill when biding on public construction assignments. The requirements concern application of information and communication technology (ICT).

DET DIGITALE BYGGERI
implementerings:netværket

Source: http://www.deaca.dk/digital_construction

BETECH DATA

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Erhvervs og Byggestyrelsen
Danish Enterprise and Construction Authority

- IFC is the Danish standard
  The use of IFC for the exchange of model data is mandatory in construction projects covered by ICT publication and the digital client demands. IFC is de facto Danish standard for exchanging BIM data. Denmark has also joined an international collaboration that works to promote the circulation of IFC through client demands and everywhere in the software that supports BIM application.

DET DIGITALE BYGGERI
implementerings:netværket

Source: Goggle translate from Det Digitale Byggeri website:
http://www.detdigitalebyggeri.dk/tech-article/ifc-%E2%80%93-ifc-modeller

BETECH DATA

Erhvervs og Byggestyrelsen
Danish Enterprise and Construction Authority

- The Palace and Properties Agency is a national property enterprise under the auspices of the Danish Ministry of Finance. They manage the state's castles and gardens for use by the royal family, government institutions and museums – and for the pleasure of the general public.

Finansministeriet
Slots- og Ejendomsstyrelsen

Ministry of Finance
Palaces and Properties Agency

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Erhvervs og Byggestyrelsen
Danish Enterprise and Construction Authority

Palace & Properties Agency

- 323 buildings
- 1.4 million m² Office Space
- Turnover DKK 1.6 Billion
- Historical Buildings/Castels

Finansministeriet
Slots- og Ejendomsstyrelsen

Ministry of Finance
Palaces and Properties Agency

BETECH DATA

Erhvervs og Byggestyrelsen
Danish Enterprise and Construction Authority

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3.4.3. Digital konsistenskontrol

			Tilvalgt
Formål og omfang Geometrikontrol og kollisionscheck af konstruktioner og installationer	Fase	Projektforslag og Hovedprojekt	X
	Filformat	IFC2x3	
	Info. Niveau	2 og 4	
	Udføres af	Alle rådgivere	

Finansministeriet
Slots- og Ejendomsstyrelsen

Ministry of Finance
Palaces and Properties Agency

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STATSBYGG

Wind Turbine design based on QuietRevolution.

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Statsbygg

Statsbygg acts on behalf of the Norwegian government as property manager and advisor in construction and property affairs. Statsbygg offers governmental organizations premises suited to their needs, either in new or existing buildings.

STATSBYGG

BETECH DATA

Statsbygg

Statsbygg

- 2300 Buildings
- 2.6 million m²
- Budget NOK 2.5 Billion
- 770 Employees
- Statsbygg organizes, plans and performs approximately 140 projects at any time.
- 10-20 projects are completed each year.

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Statsbygg

BIM Guidelines

- Main elements
- To be able to use BIM in practice, there are three main elements that must be in place, often called BIM triangle. It is possible to build all the three elements of open, international standards / specifications.

- Agreed storage format (IFC)
- consensus on terminology (IFD)
- connect the BIM to a relevant business processes (IDM)

Source: Goggle translate from Statsbyggs website:
http://www.statsbygg.no/FoUprosjekter/BIM-Bygningsinformasjonsmodell/BIM-En-kortfattet-innforing/

BETECH DATA

Statsbygg

Example from the Statsbygg Competition Programme for the new National Museum of Art, Architecture & Design

6.5.2 Requirements for digital tools

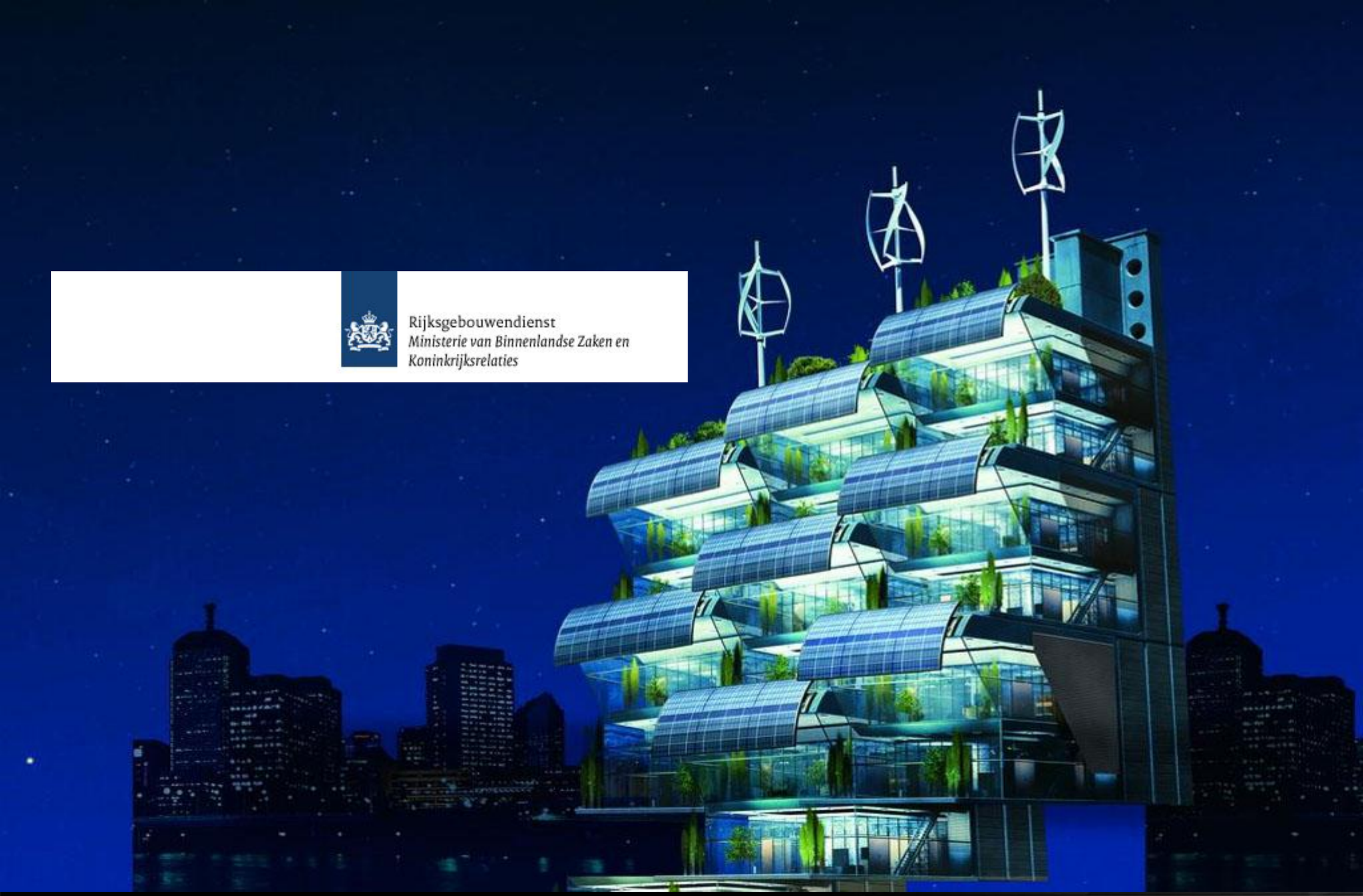
For the development and refinement of the building programme after Phase 1 the programming tool «dRofus», supplied by Nosyko AS will be used. (http://www.drofus.no/)

Contestants will be required to generate and develop an object-based digital Building Information Model (BIM), using the open BIM standard IFC, after Phase 1. For more about BIM and IFC, see: http://www.statsbygg.no/bim.

Strict requirements will apply for the computer-aided design (CAD) and similar tools used, namely that they may be fully integrated with a future design team, and can tackle the IFC standard efficiently according to Statsbygg's BIM Manual.

Source: http://www.statsbygg.no/FilSystem/files/prosjekter/nasjonalmuseet/competitionProgram.pdf

Rijksgebouwendienst
Ministerie van Binnenlandse Zaken en Koninkrijksrelaties



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Rijksgebouwendienst
The Dutch Government Buildings Agency

- The Government Buildings Agency is part of the Ministry of the Interior and Kingdom Relations.
- The agency's task is to manage and develop the State’s largest property portfolio.

Rijksgebouwendienst
Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

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Rijksgebouwendienst
The Dutch Government Buildings Agency

Rijksgebouwendienst

- 2000 Properties
- 7 million m², of which 70% is owned by the Agency
- Working as a Chief Government Architect, advising the government on matters relating to architecture and architecture policy in the Netherlands.

Rijksgebouwendienst
Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

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GSA U.S. General Services Administration

Wind Turbine design based on QuietRevolution.

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GSA – U.S. General Service Administration

- The **General Services Administration** (**GSA**) is an independent agency of the United States government, established in 1949 to help manage and support the basic functioning of federal agencies.

- The GSA supplies products and communications for U.S. government offices, provides transportation and office space to federal employees, and develops government-wide cost-minimizing policies, among other management tasks.

- GSA U.S. General Services Administration

GSA – U.S. General Service Administration

GSA

- 8300 Buildings
- $500 billion in U.S. Federal property
- Annual operating budget of roughly $26.3 billion
- 12,000 Employees

GSA U.S. General Services Administration

GSA – U.S. General Service Administration

BIM Guidelines

GSA BIM Guide Series 1:

2.3.1 BIM Information Exchange Standards

The GSA encourages the use of open standard for information exchange. As such, a standard is not yet widely supported by software applications. OCA is still using proprietary data formats for many 3D-4D-BIM applications.

One example is the Industry Foundation Classes (IFC) data model developed by the International Alliance for Interoperability (IAI) (www.iai-international.org). The IFC specifications define the content and structure for BIM exchange between software applications and participants in a building project. The IFC model schema is based, in part, on the ISO 10303 Product Data Modeling standard. The IFC specifications have been submitted for consideration as a new ISO standard and are currently in international review for such standardization.

IFC defines a structure for BIM data that is independent of individual applications. IFC is used to exchange BIM data among different applications and participants in a building project. To begin this exchange, a sending application translates its internal representation of the building model from its native data structures to IFC BIM structure. The model is then typically persisted in one of two file formats: .IFC or .IFX (the latter being an xml format). To complete the exchange, a receiving application then loads the IFC BIM file and translates objects from IFC structures to its native data structures for internal representation. The vendor-neutral IFC schema for BIM is the backbone of a process and technology that enables software vendors and end user organizations to achieve interoperability between a wide array of application types for the building industry.

Source: http://www.gsa.gov/graphics/pbs/GSA_BIM_Guide_v0_60_Series01_Overview_05_14_07.pdf

IFC wrap up

Country/Government	Collaboration Initiatives	Governmental Requirement	Signed the IFC Statement
FInland	ProIT	Senate Properties Requires IFC	Yes
Norway	Den Kloke Tegning	Statsbygg requires IFC	Yes
Denmark	Digital Construction	Use of IFC and DBK is encouraged	Yes
Sweden			No
Netherlands			Yes
United States of America		Use of IFC is encouraged by GSA	Yes

Spinoff to the Commercial Sector

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Thank you!

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