BIM
BUILDING INFORMATION MODELLING

Interfaces between Building Services & Architectural Models

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About ArcDox

About the Presenter

- **Ralph Montague** BArch MRIAI
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  - Board Member, National BIM Council of Ireland
  - Chair, National Standards Authority of Ireland (NSAI) BIM Mirror Committee
  - Board Member, Construction IT Alliance (CITA)
  - Coordinator, CITA BIM Group
  - Chairman, RIAI Practice Sub-Committee for BIM
  - Architects Council of Europe (ACE) BIM Working Group

- **ARCDOX** | Enabling & Supporting BIM
  - Consultancy, Production, Support & Training
  - 20+ years Industry Experience
  - 8+ years Experience with BIM
  - 100+ Projects in BIM
  - 1000+ People Trained in BIM Tools
Agenda

BIM (Building Information Modelling)
- Interfaces between Building Services & Architectural Models?
- How BIM supports Collaboration between the Disciplines?

BIM

WHY

WHAT

HOW
The Beautiful Idea of BIM - Build the Building Twice

Object-Based Modelling (not line-based drawing)
- Virtual Buildings Assembled from Objects with Intelligent Building Data – Digital Prototyping

- **3D Components & Assemblies**
  - 3D Components & Assemblies
  - Structural & Core Elements
  - Building Elements
  - Roof
  - Walls
  - Floors
  - Windows
  - Doors
  - Bathrooms
  - Kitchen
  - Furniture & Fittings

<table>
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<th>Door</th>
<th>Size</th>
<th>Manufacturer</th>
<th>Model No.</th>
<th>Finish</th>
<th>Fire Rating</th>
<th>Acoustic Rating</th>
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The Beautiful Idea of BIM - Outputs Derived from Model Data

**Fully Coordinated Drawings and Information Schedules**
- Information or “Documents” Derived or Extracted from the Information Model/Database

![Diagram showing BIM outputs and inputs]

- Elevations
- Plans
- Details
- Renderings
- Drawings Sheets
- Sections
- Schedules
- Building Analysis Information
- NBS Specification
The Beautiful Idea of BIM - Collaboration & Analysis of the Virtual Model

Level 2 BIM - Sharing Models for Coordination Review

- Site/Civil Model
- Architectural Model
- Structural Model
- Services Model

Federated Model

3D Coordination

4D Sequencing
5D Cost Control
6D Sustainability Analysis
7D Facilities Management
The Beautiful Idea of BIM - Giving Clients What they Really Want

What Do Clients Want? BETTER PROJECT OUTCOMES

- What are we Building? Will it suit our needs, our image?
- Is it well-designed, well-constructed, and durable?
- What will it cost to Maintain, Manage & Operate?
- When will it be Delivered?
- How much will it Cost?
- Are we getting good Value for money?
- Are our Risks being effectively managed?

Better Buildings, Built Quicker & Built Cheaper

UK 2025 Construction Strategy Targets

50% BETTER
50% QUALITY
33% QUICKER
5D BIM
5D BIM
4D BIM
6D BIM
7D BIM
3D BIM

33% CHEAPER
33% VALUE
33% CERTAINTY
The Ugly Reality of BIM - Current Practice

Traditional Methodology
Intellectual / Productive Input into Multiple Disconnected Documents

- Time Consuming / Costly
- Prone to Human Error
- Problematic

BIM Methodology
Intellectual / Productive Input into a Virtual Building Information Model

- More Efficient
- Better Quality Documentation
- Better Outcomes

Documents Derived from BIM
Change Anywhere = Change Everywhere
The Ugly Reality of BIM - Current Practice

Relationship between Architectural Design & Building Services Design

- Current practice is linear, siloed, slow & time-consuming
- No direct relationship between design data & calculations (few or no feedback loops)
- Analysis typically left to confirm design (later), rather than inform design (earlier)

The introduction of BIM, by itself, does not change human behaviour or collaboration
BIM Collaboration - New Practices & Procedures

Agile Design Approach
- Iterate & Analyse Quickly & Often
- Experiment
- Collaborate
BIM Collaboration - New Practices & Procedures

Relationship between Architectural Design & Building Services Design

- Exchange Data, Remove “Friction” & “Barriers”
- Analyse & Iterate Often with “feedback loops” to Inform Design
- Communicate

![Diagram showing the relationship between Building Information Model, Energy Analytical Model, Data Exchange, Feedback Loops, and Energy Calculations Software]
BIM Collaboration - New Practices & Procedures

**Relationship between Architectural Design & Building Services Design**

- Collaboration is a “People” Issue, rather than a Technical Issue - Let’s Talk & Work Together
- Contracts & Agreements that allow and support more Agile Design Process (early engagement)
- Standards to Support “collaboration” around quick “transfer” of data for analysis
  - Data Schemas (ISO 16739 - IFC)
  - Data Dictionaries & Classification (ISO 12006 - IFD)
  - Data Exchange (ISO 29481 –IDM & MVD)
- Technologies that support Dynamic Data Exchanges
BIM in Europe

European Union BIM Initiatives

  All 28 EU Member States may encourage, specify or require the use of BIM for publicly funded construction projects in the EU from 2016.

- **EU Government Policies & Initiatives**
  UK, Netherlands, Denmark, Finland, Norway, Sweden, France, Germany etc require BIM for publicly funded construction projects.

- **EU BIM Task Group**

- **EU BIM Standards**
  CEN TC 442 - EU Standards for BIM being adopted or developed
  ISO TC 59 – International Standards for BIM
BIM in Ireland

CITA BIM Group - The “Meeting Place” for BIM in Ireland

- 20+ Industry Stakeholder Organisations Officially Represented
- 7000+ Members, Discussions & Free Resources on LinkedIn
- 2011-2017 CITA Smarter Building Series
- 9 Regional BIM Groups
  - Dublin, Cork, Waterford, Tralee, Limerick, Galway, Athlone, Sligo, Letterkenny
- BIM Gathering Conference (23-24 Nov 2017)
- BIM Innovation Capability Programme (BICP)
- National BIM Council
- NSAI National Mirror Committee for BIM Standards

www.CITA.ie
www.BICP.ie
www.NBCireland.ie
BIM Consultancy - How Can ArcDox Help?

Enabling & Supporting BIM

- Specialist BIM Consultancy Services to Project Teams
- Access to Professional Expertise on “As Required” Basis

- **BIM Consultancy**
  - Implementation Advice, Execution Plans, Project Setup & BIM Workshops
  - Documentation, Standards, Templates & Libraries

- **BIM Production**
  - Stay Lean – Access Expert Resources for Workload Demand Peaks
  - Outsource Non-Design Work (2D–3D Conversion)

- **BIM Training**
  - Revit Architecture, MEP & Structure, Navisworks, 3D Max Design, etc
  - Autodesk Authorized Training & Certification Centre, RIAI CPD Links

- **BIM Support**
  - Online, On Call or In-House – Keep Team Members Productive
  - Technical Advice, Model Management, Review & Quality Control
Contact Details

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QUESTIONS