

SDI Program at the University of Chicago



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SDI Program at the University of Chicago

- **Discussion Outline**
 - **University/Facilities Services**
 - **The Story Begins.....**
 - **Major Components of SDI Program**
 - **Conceptual Design**
 - **Current Status**
 - **Next Steps**

SDI Program at the University of Chicago

- **University and Facilities Services Department**
 - **Worldwide facilities, Medical Center, national labs**
 - **Nearly \$500 million a year in research**
 - **400 buildings, 20 million square feet**
 - **Department Divisions:
Planning/Design/Construction/Operations**



SDI Program at the University of Chicago

- **The Story Begins.....**
 - **Brought in initially to build the GIS – BUT!**
 - **The Silos.....**
 - ü **Both GIS and BIM are coming on line**
 - ü **Big repository of CAD drawings**
 - ü **LiDAR point clouds will develop even more data!**
 - **So What is Correct????**
 - ü **Need a approach to utilize all spatial data – SDI**

Its not a GIS or BIM/CAD – its SPATIAL DATA!!!!

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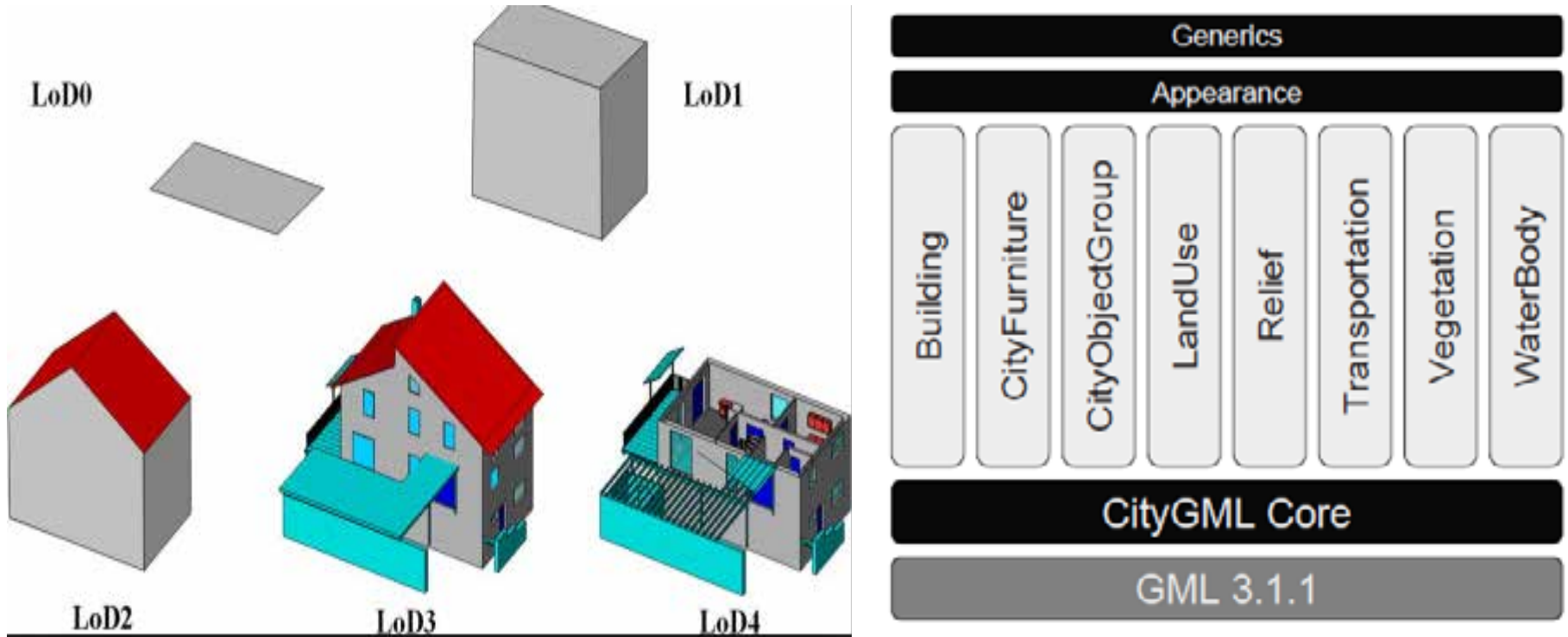
- **Goal & Objectives:**
 - **Goal: Provide a SDI that is fully interoperable in order to add value to the operation and academic missions of the University.**
 - **Objectives:**
 - ü **Single Version of Reality**
 - ü **Include ALL physical assets**
well...not nuts and blots!!!
 - ü **Model to include 3D & 4D capability for assets**
 - ü **Built to International Open Standards (OGC)**

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- **Major Components of SDI Program:**
 - **Open Data Model/Systems of Record**
 - **Spatial Accuracy – different acquisition/results**
 - **Support Department Operations: existing and new**

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- **Open Data Model/Systems of Record (SOR)**
 - **Open Data Model – CityGML**
 - ✓ **Geometry/LOD/Ontology-Semantics**

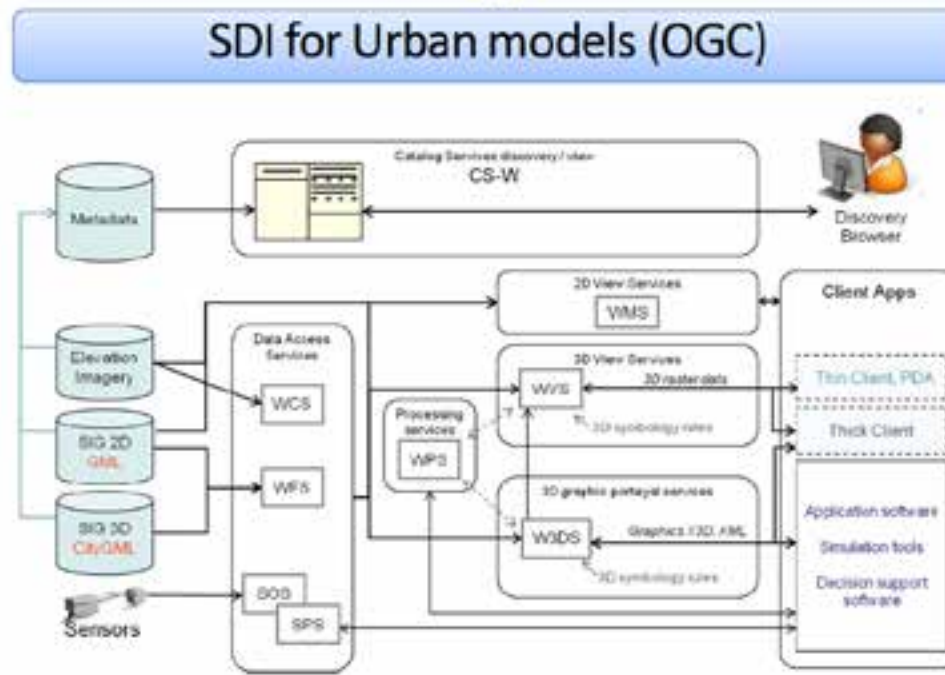


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- **Open Data Model/Systems of Record (SOR)**
 - **Systems of Record: CAD/BIM/GIS**
 - ✓ **Existing application/modeling support**
 - ✓ **CityGML adding spatial data objects as needed**

SDI Program at the University of Chicago

- **Open Data Model/Systems of Record (SOR)**
 - **OGC Open Standards**
 - ✓ **Open Web Services (OWS) Sensors (Smart Cities), COBie (Asset Management)**

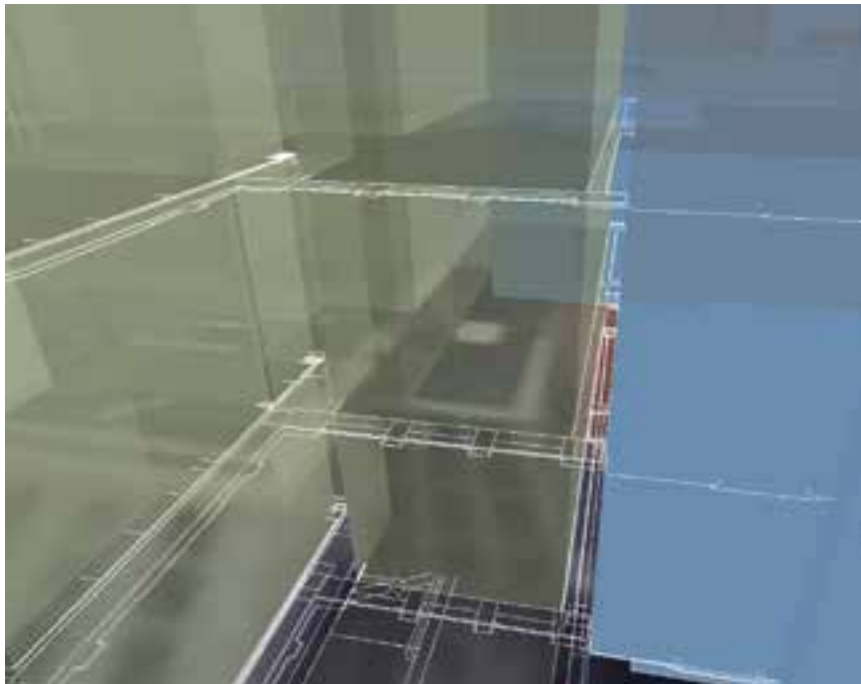


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- **Open Data Model/Systems of Record (SOR)**
 - **The Balance...**
 - ü **Central repository – how much is enough? SOR will have all the data.**
 - **The Challenge....**
 - ü **Not all of the CityGML/GML standards are completely in place – but its coming!**
 - ü **Few Software/Models run in CityGML – but this is changing with OWS plugging into spatial models**

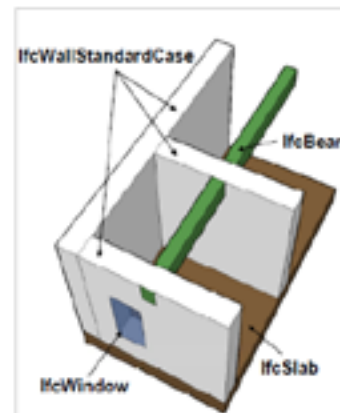
SDI Program at the University of Chicago

- **Spatial Accuracy**
 - **Data Harvesting from the SOR's**
 - **Data Harmonization**



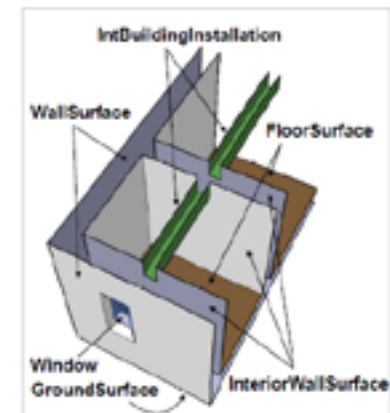
Differing Modeling Paradigms

BIM (e.g., IFC)
Constructive Solid Geometry



Volumetric, parametric primitives representing the structural components of buildings

3D GIS (e.g., CityGML)
Boundary Representation



Accumulation of observable surfaces of topographic features

C) slide from: Thomas H. Kolbe - joint work with Claus Nagel & Alexandra Stadler

SDI Program at the University of Chicago

- **Spatial Accuracy: Data Harvesting from SOR's**
 - **Data Acquired from different models and sources**
 - **Varying levels of Accuracy – Class System**
 - **Often not in State Plane**

Deal with these issues:

Standards & Templates (Data Creation)

*Program Managers – BIM, GIS, CAD & SME's
(Project Management)*

SDI Program at the University of Chicago

- **Spatial Accuracy: Data Harmonization**
 - **Central Repository (CityGML) is very large/complex – rule based system:**
 - ü **Geometric: connectivity**
 - ü **Retain/Replace: SOR and Data Classes**
 - ü **‘Coherent Spatial Unit’ concept for spatial objects: replacement/archive/future**

Will attempt to hit the 80/20 rule – some manual review will be required.

Fully leverage Oracle Spatial/Golden Gate Technology

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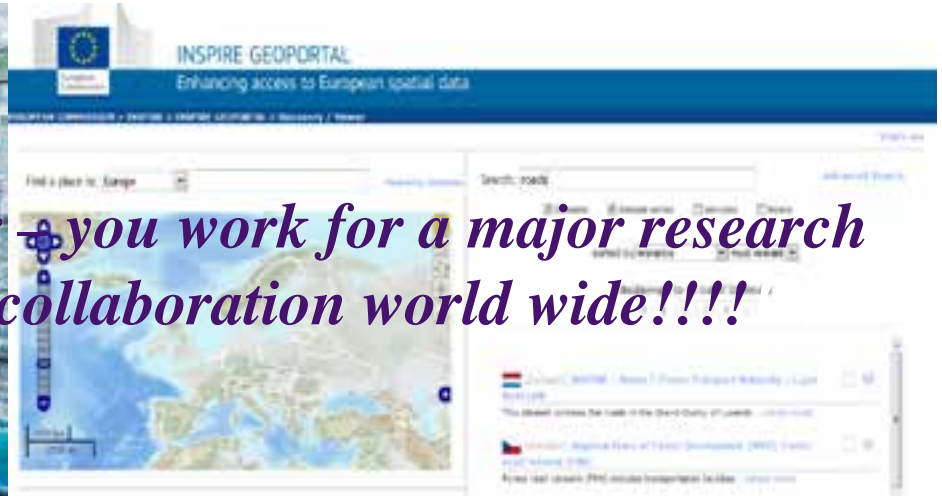
- **Support Operations – Current:**
 - **Space Management: Archibus – CAD only**
 - **Asset Management: Maximo – BIM/GIS**
 - **Engineering/Landscape Architecture – CAD**
 - **System Modeling/Monitoring – CAD/BIM**

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- **Support Operations – Future:**
 - **Space Optimization: NASA – ArcGIS Server**
 - **Visualization: Central Repository/Virtual Campus**
 - **Map front end for the FS Catalog:**
 - ü **Get to all data sources within the Department**
 - ü **Link into SOR objects for the details**



The final kicker – you work for a major research University with collaboration world wide!!!!



SDI Program at the University of Chicago

- **Conceptual Design – SDI Program:**
 - **Planning/Design/Construction/Management – Major Components:**
 - ✓ **Planning – Space Optimization**
 - ✓ **Design – program package/design evaluation**
 - ✓ **Construction – E-builder: management/payouts**
 - ✓ **Management - COBie, Central Repository, Catalog, Visualization**

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- **Conceptual Design – SDI Program:**
 - **Case Study: Building Energy Efficiency**
 - ✓ **Program: Program Development/Specifications**
 - ✓ **Design: Energy modeling – Building Performance**
 - ✓ **Construction: Quality Control/Inspections**
 - ✓ **Management: calibrate BAS, post occupancy audit, changes in FS energy modeling efforts.**



SDI Program at the University of Chicago

- **Current Status:**
 - **SDI Program Plan**
 - **Initial visualization testing completed – informing the data modeling process in place**
 - **CAD/GIS Standards**
 - **Core collaborative partners established for key implementation areas**

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- **Next Steps:**
 - **Completing Systems of Record/Establishing Standards/Methods:**
 - ü **BIM Standards – end 2014**
 - ü **SOR Data – GIS end of 2016????**
 - ü **BIM SOR existing – long time horizon**
 - **System of Record > Data Harvesting > Central Repository (CR): Start 2015**
 - **Building the Data Management Tools (CR): start in 2016**

Thank You

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