OPEN BIM and the future: BIM and GIS integration

Building the DND Real Property Spatial Data Framework
Assistant Deputy Minister (Infrastructure & Environment)
Major Influences of Change at the DND

- Canada First Defence Strategy
- Building Information Management Implementation
- Infrastructure and Environment Business Modernization

Real Property and Military Engineering groups are working together to develop a central Spatial Data Warehouse in support of lifecycle asset management.
Canada First Defence Strategy

Infrastructure: One of the Four Pillars

Sound infrastructure is required

This is where BIM comes into the picture/portfolio

Usage of BIM represents increased efficiency in project delivery and portfolio management

http://www.forces.gc.ca/site/pri/first-premier/index-eng.asp
Building Information Modelling

BIM
What is BIM?

Many definitions of the acronym exist from different sources:

• OGC – Open Geospatial Consortium;
• NIBS – National Institute of Building Sciences;
• RAIC – Royal Architectural Institute of Canada;
• AIA – American Institute of Architects;
• Vendors – Autodesk, Bentley, Graphisoft and others.

NIBS – A computable representation of the physical and functional characteristics of a facility and its related project/lifecycle information using open industry standards to inform business decision making for realizing better value.

BIM is NOT limited to buildings.
Background

- As an owner and manager of assets, DND stands to gain the most from a BIM environment.
- BIM implementation is driven from the Director General level.
- We are about half-way into the process which involves:
  - Develop/adopt new DND CAD/BIM standards, policy and guidelines;
  - Phased CAD/BIM hybrid approach;
  - Education and Training;
  - Outreach to Industry and other government departments;
  - Realize the ultimate goal of OpenBIM™

- Apply Open Standards in the integration of this information with GIS and legal data to create a complete spatial data repository.
DND’s Multi-Year Transition to BIM

Research and Develop
- Develop standards and guidelines
- Define dataset
- Begin hybrid approach (CAD and BIM) 2009 - 2011

Initiate
- Initiate pathfinder projects and apply testing to inform future projects
- Provide training, mentoring, support
- Validate strategy direction 2010 - 2012

We are here
- Apply lessons learned from initial phases
- Use BIM on actual projects 2012 - 2015

Integrate
- Integrate BIM into everyday practice and project delivery (Integrated project delivery)
- Find ways to improve our processes and deliverables 2015
Little BIM to BIG BIM

**Little BIM**
In simple terms…
Used to Deliver a Project

**BIG BIM**
In simple terms…
Concept to Demolition
BIM and Standards

- The global BIM standards will incorporate “model views" of information exchanged between AEC and DND the owner / operator. The standards will build upon standards in use today, in particular:
  - The buildingSMART (formally International Alliance for Interoperability) IFCs;
  - Standards of the National Institute for Building Sciences (NIBS)
  - ISO standards;
  - Open Standards Consortium for Real Estate (OSCRE) standards;
  - Open Geospatial Consortium (OGC) standards;
  - The FIATECH capital investment roadmap;
  - Efforts like CSI OmniClass taxonomies, COBIE (Construction to Operations Building Information Exchange), etc.

- All of these will have an impact on our ability to exchange Real Property information on a corporate wide basis.
BIM Strategy Direction

- Bringing change to lifecycle management processes of an asset.
- The industry is entering Level 2 with many still working in 2D CAD.
- The ultimate position is shown as OPEN BIM, where all data and systems are integrated and interoperable using the same data.
Outreach

Through its membership in the Institute for BIM in Canada (IBC), DND plays an active role in the promotion and application of OPEN BIM in Canada.

IBC Mission:

“Act as the authoritative voice for BIM in Canada.”

Formed in late 2010, Constituent Organizations:

• Association of Consulting Engineering Companies (ACEC)
• Canadian Construction Association (CSA)
• Construction Specifications Canada (CSC)
• Royal Architectural Institute of Canada (RAIC)
Institute for BIM in Canada

• Develop contract language
  • Supplementary conditions to existing contract forms
  • Standalone contract forms
• Established the Canadian Chapter of buildingSMART International in mid 2011.
• Canadian practitioners were participating in the work of the North American chapter, the buildingSMART Alliance
• Need to establish Canadian chapter due to differences between US and Canadian industries.
  • Legal
  • Language
  • Metric System

www.ibc-bim.ca
INTEGRATION

It’s All About the…

DATA
Data Sharing – Today

Finance

Facilities Management

Real Property

Architecture & Engineering Design

Fire & Life Safety

Project Delivery

Analysis
## Modernize Spatial Data Environments

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Spatial Data Management and Sharing

**Goal:** Establish departmental spatial capability that is fully integrated with the enterprise system.

- Creation of a Real Property Spatial Data Office (OPI) that will:
  - Develop, implement and monitor policies, standards and guidelines for spatial data management;
  - Provide governance and stewardship of spatial data;
  - Develop framework and functional specification for a centralized Spatial Data Warehouse;
  - Integrate AEC, GIS and Legal data into a single authoritative source;
  - Allow for the collaboration between spatial applications that require vast amounts of data.

- The main benefits of centralized integrated spatial data are:
  - To realize the value that accurate spatial data represents to ERP and BI.
  - To reduce the risk of stranded technologies by enabling the users to adopt new platforms without effecting the warehouse;
  - To standardize infrastructure information management for all phases of lifecycle.
Spatial Data Integration Mandates

- Surpass government requirements (Treasury Board);
- Allow class structures for GIS and BIM data to co-exist;
- Establish rich metadata through ISO 19115:2003;
- Ensure support for a multitude of software applications;
- Include terrain, buildings, legal and site infrastructure;
- Ensure the platform provides speed, scalability and interoperability;
- Provide validated information through an automated workflow;
- Track progress and apply Total Quality Management principles in the refinement of the system.
- Share the model with other government real property departments.
Data Sharing – Collaboratively

- Finance
- Real Property
- Architecture & Engineering Design
- Object Level Data Exchange
- Project Delivery
- Analysis
- Facilities Management
- Visualization
- Fire & Life Safety
The Complete Campus Model: an example

Data Sources

GIS

BIM/CAD

LEGAL

RASTER

Compiled for Visualization
Questions Welcome