

# buildingSmart Australasia

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# Presentation outline

- **Who are buildingSmart?**
- **What is this BIM thing?**
- **Why is BIM relevant?**
- **A bit about IFC?**
- **What are buildingSmart doing in Australasia?**
- **How can you be involved?**

# Introduction: buildingSMART

buildingSMART is a world wide alliance driving the transformation of the built environment through creation and adoption of open, international digital standards

## International Leaders



Richard Petrie  
CEO Designate



Patrick MacLeamy  
Chairman

# Introduction: International Network

Australasia  
Benelux  
Canada  
China  
French  
German  
Hong Kong  
Italia  
Japan  
Korea  
Middle East  
Nordic  
Norway  
Singapore  
United Kingdom  
USA



# Introduction: Mission and Goals

## Values

- Open
- Neutral
- Not-for-profit
- International

## Custodian of IFC

- Data
- Processes
- Dictionaries
- BIM Standards

## Goals

- Create open BIM standards
- Host open BIM forum
- Certify software and people
- Become a trusted resource
- Promote active use



# buildingSMART International

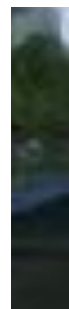
## ISO Standards originated by buildingSMART International

- Building Information Modelling **IFC4** - ISO 16739-12:2012
- Terminology **bsDD** - ISO 12006-3:2007
- Process Model **IDM** - ISO/FDIS 29491-1:2009
- Framework for building information modelling (BIM) **guidance** -  
ISO TS 12911-2011

# **BIM:** So what is this BIM thing?

- BIM starts with a 3D model built with objects that represent real world elements like windows, doors, walls, floors etc
- It is created in a similar way to how you'd build
- 3D model allows reuse of common data across the process
- Adding cost is known as 4D BIM
- Adding time is known as 5D BIM

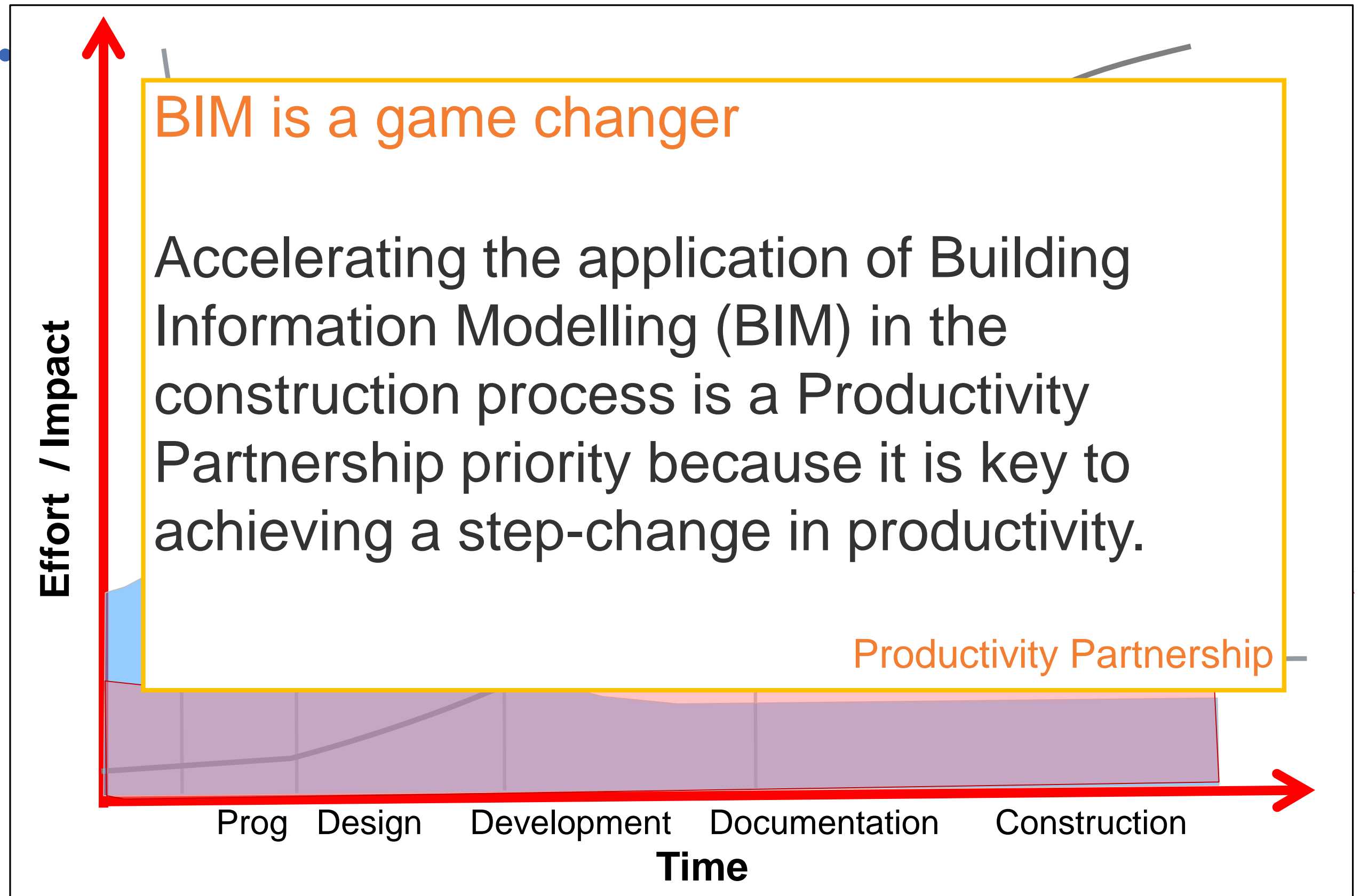






# Why is BIM relevant?

# BIM: The impact of poor communication



# A bit about IFC: Industry Foundation Classes (IFC)

- ☐ If you are not specific about the information you need, how can you be certain you'll get it
- ☐ Will different users produce the same model with different software?
- ☐ Will different users produce the same model with the same software...
- ☐ IFC is a format that allows disparate software systems to communicate

# Standardisation: Benefits

**Building Owners / Operators**      better project definition, delivery and asset operation.  
**Building Regulators**

**Software Vendors**      standardized processes for advanced features.

**Product Manufactures / Users**      make it easy to use their products

**Architects, Engineers**      efficient communication reduce risk and costs  
**and Contractors**

# IFC Objectives

- Set the standard for object-based data exchange and sharing of virtual buildings:

- **IFC schema**

- the comprehensive foundation specification for information



- **Dictionary**

- consistent names and definitions for different properties to support catalogs, classification systems etc.



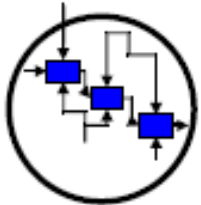
- **Exchange Requirements**

- units of the IFC model tailored for use in particular business situations



- **Reference Processes**

- specification of common processes reusable across multiple projects



- **SMART documents**

- building codes, specifications, standards etc. tagged for use with IFC based applications



# What Can IFC do?

## Shape (explicit)

## Shape (extrusions)

beams, pipes, ducts, walls etc.

## Shape (topology)

line representations for pipe, duct, etc

## Building Elements

wall, door, window, roof, stairs, etc.

## HVAC Equipment

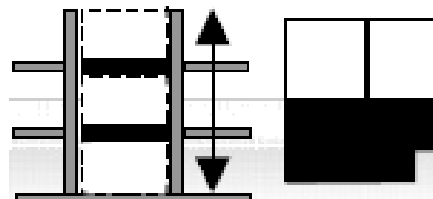
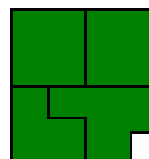
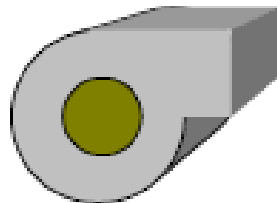
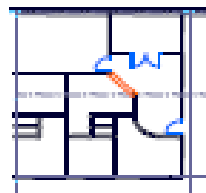
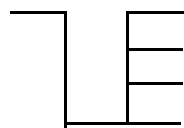
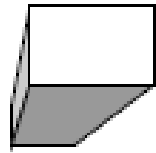
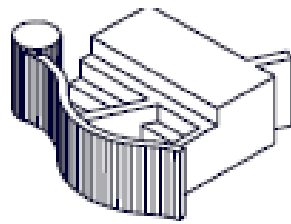
chillers, fans, pumps, boilers,  
coils, cooling towers, heaters,  
heat exchangers, etc..

## Spaces, Space Structure

Space, storey, part, building, site

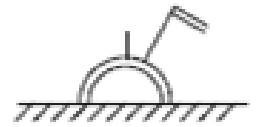
## Zones, Compartments

fire, workstation, rising ducts,



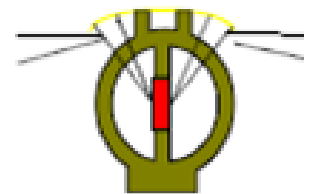
## Electrical Elements

transformers, motors, generators,  
switches, protective devices,  
power and communication outlets  
panels, cubicles



## Sanitary Elements

WC's, urinals, baths, bidets, traps  
Gulleys

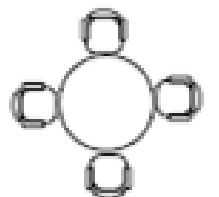


## Fire Protection Elements

sprinklers, hose reels, hydrants,  
wet/dry rising mains

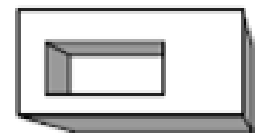
## Furniture

inc. system furniture



## Relations Between Elements

holes, chases, voids, zones





# and ...

## Systems

pipng, ducting, cable, structural

## Lighting

fittings, rendering, photo-accurate lighting

## Manholes

manholes, inspection chambers, access chambers, meter chambers, valve chambers

## Time Series

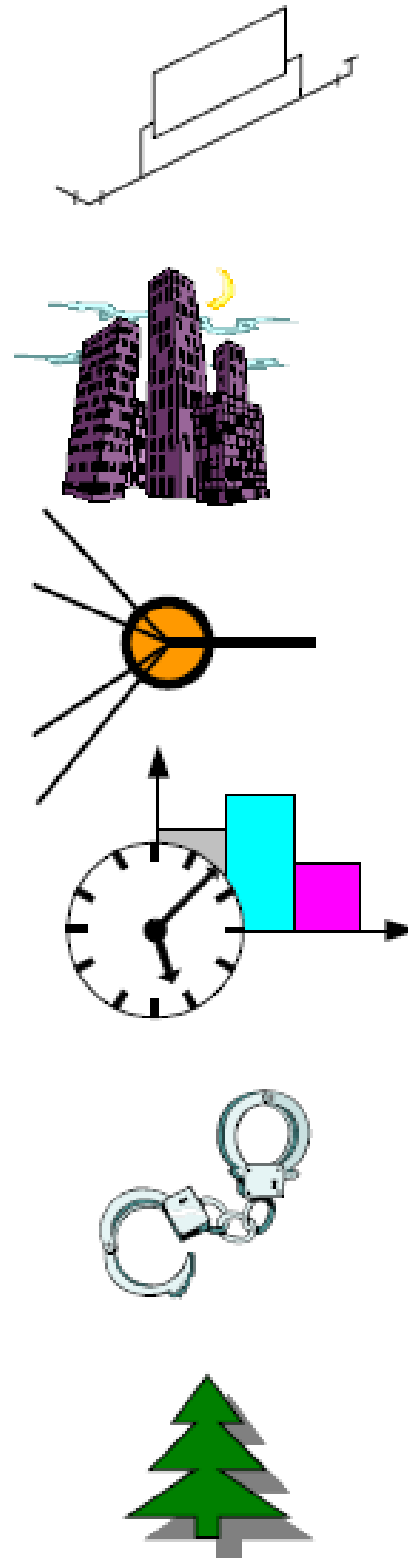
time related events

## Constraints

rules, specifications, requirements trigger conditions

## Environmental Impact

embodied energy, CO2



## Controls, Instruments

sensor, actuator, controller, gauge, meter

## Grids

## Draughting

## Holes and Bases

holes, sleeves, packing, framing, up stands, vibration isolation

## Accessories

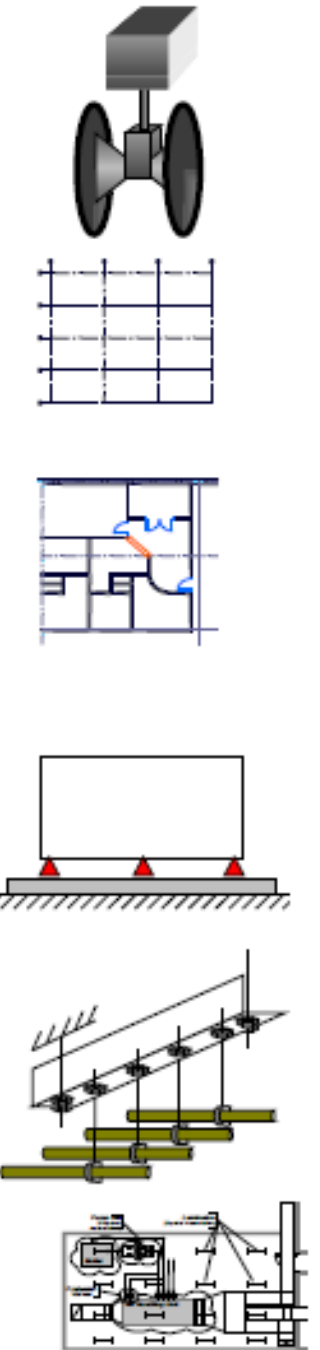
brackets, drop rods, steel sections, bracket assemblies, screws, bolts etc.

## Asset Management

maintenance history, inventories

## Help

request, action, permit, warranty, operation



# ...and

## Actors

people, organizations, addresses

## Costing

cost planning, estimates, budgets,  
whole life

## Work Plans and Schedules

inc. nested schedules, resource allocat

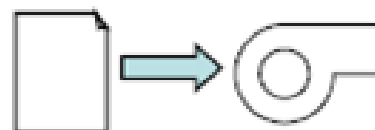
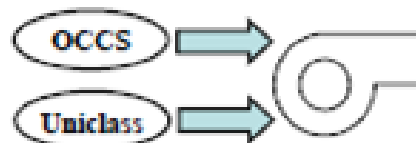
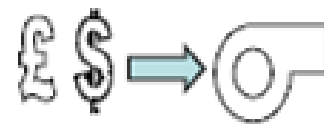
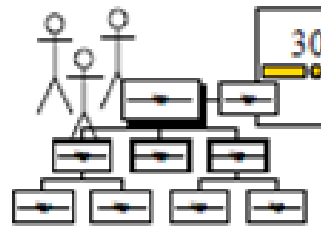
## Orders

work orders, change orders,  
purchase orders

## External Data

## Classification

## Associated Documents



## Connectivity

services, structure, building

## Geographical Elements

features, contours, regions

## Coordinate Mapping

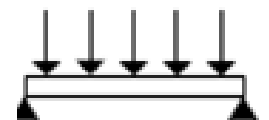
geodetic, cartesian

## Structural analysis:

structural members, boundary  
conditions, connections, supports,  
loads, etc.

## Structural Elements

members, profiles, rebars,  
properties,  
joints, features, surface



# buildingSMART Australasia: Membership

- Building owners and developers (both government and private)
- University academics
- Builders, Architects, Engineers
- Industry bodies
- Software developers

## NZ

Masterspec

MBIE (gold sponsor)

Naylor Love

bisco

Cadimage (ArchiCAD)

**Australian bias - need more  
New Zealand involvement**

Long NZ involvement with Dr Robert Amor from University of Auckland  
and Don Bunting of Masterspec

# Introduction: buildingSmart Australasia

- Works with buildingSMART international standards and tools
- Run educational and training seminars
- Members network around the world
- Provide support to Government initiatives such as BIM Handbooks

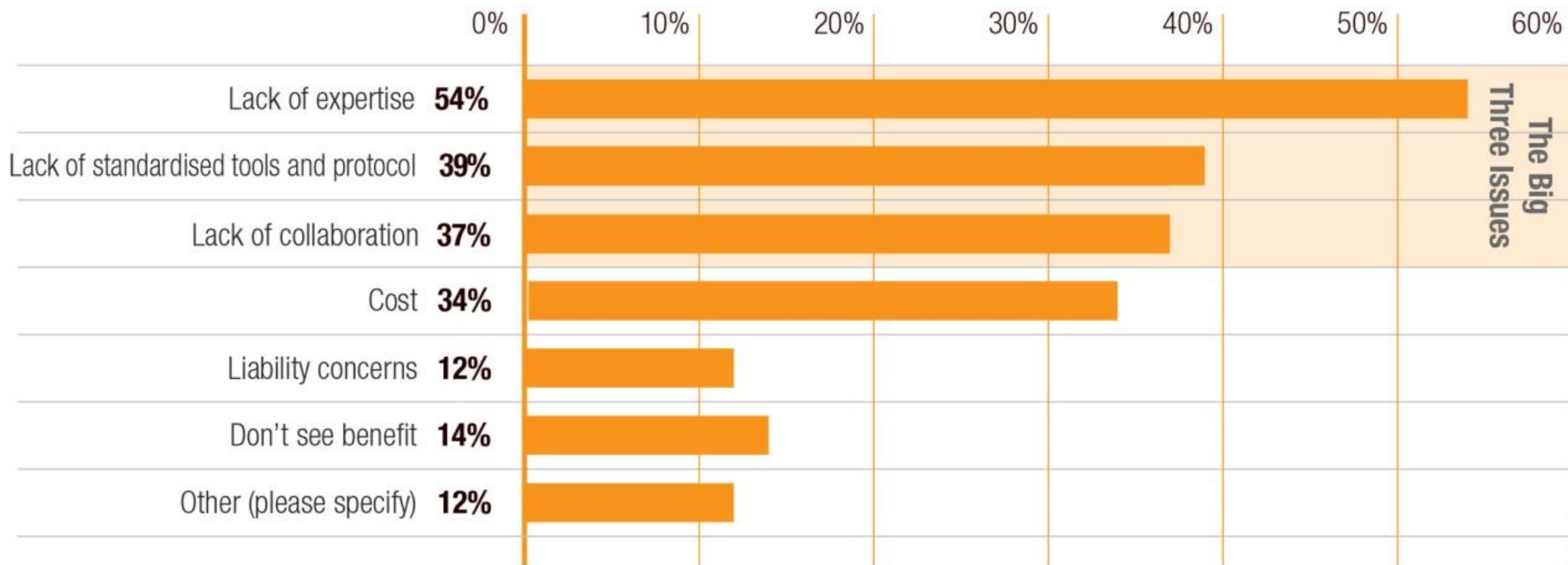
# **Australasia: Current focus**

**National BIM object library**

**Data dictionary**

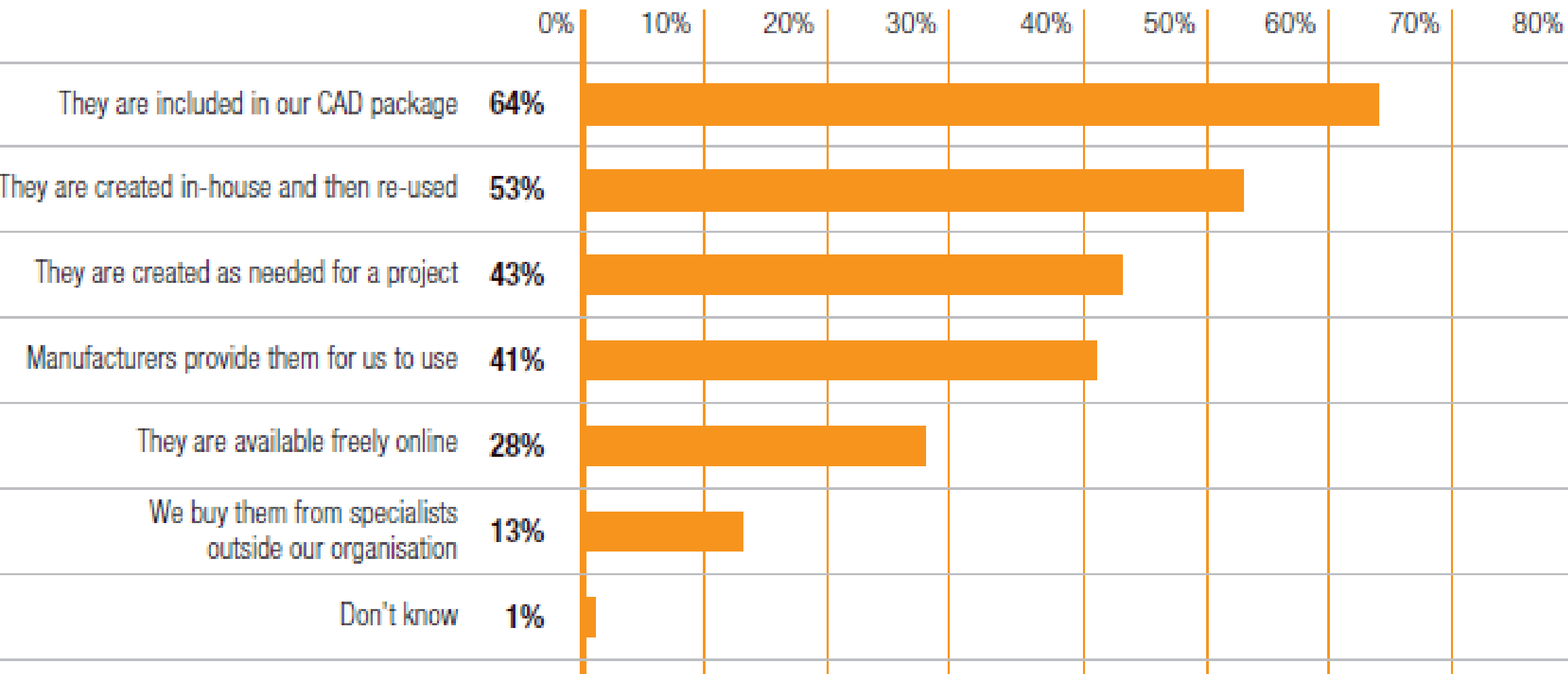
**Classifications**

# NZ BIM Library: What are the main barriers to using BIM





# NZ BIM Library: Sources of BIM Objects by designers



Two significant changes have occurred since the 2011 survey; a reduction from 75-64% in the use of the objects provided with a respondent's own CAD package; and a major change from 58% down to 28% for the use of objects available on line. Why such a major change in the use of online objects? This may reflect a reluctance to use objects of unknown quality or lack of compatibility and/or the fact that most online objects are brand-specific.

The wide spread of locations where objects are being sourced is a concern in ensuring interoperability.

*"Interoperability between the main software providers will make it easier"*

# NZ BIM Library: Vision

masterspec



- Standardised and consistent
- Based on international frame work
- Suitable for design, construction and operational phases
- Generic and branded objects
- Free-to-use with published standards
- Object contributions from market
- Librarian to verify

# Data Dictionary

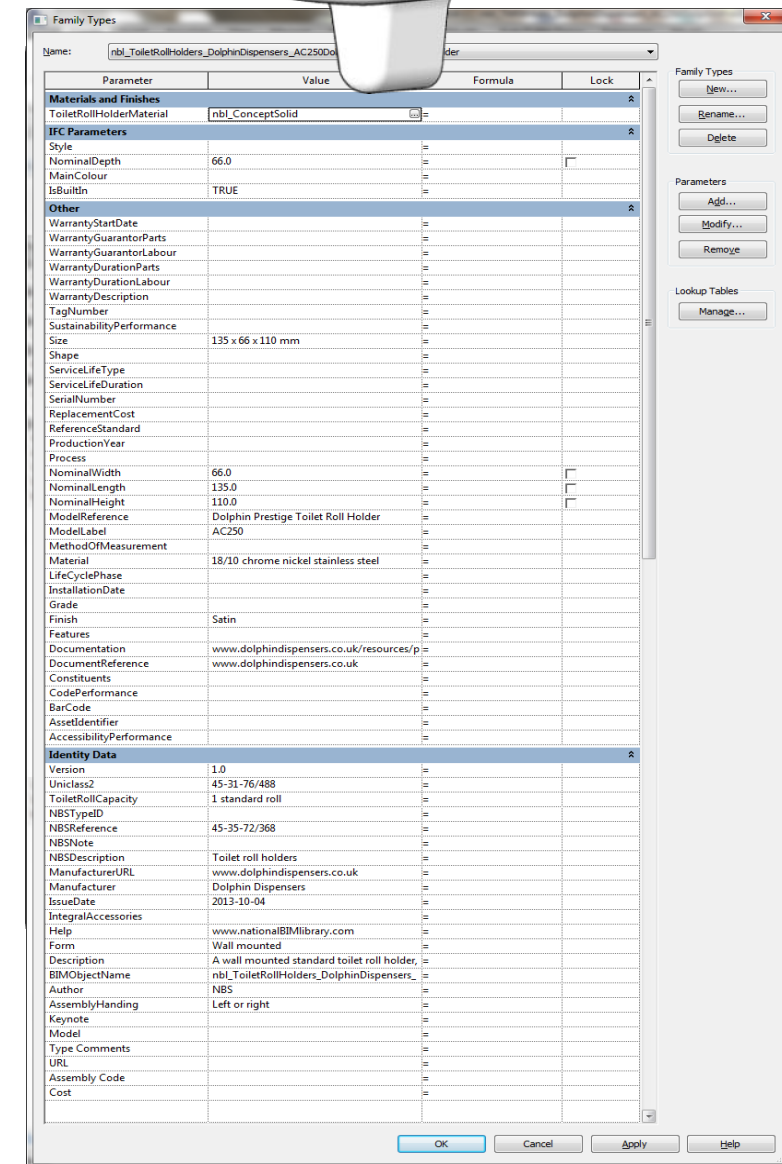
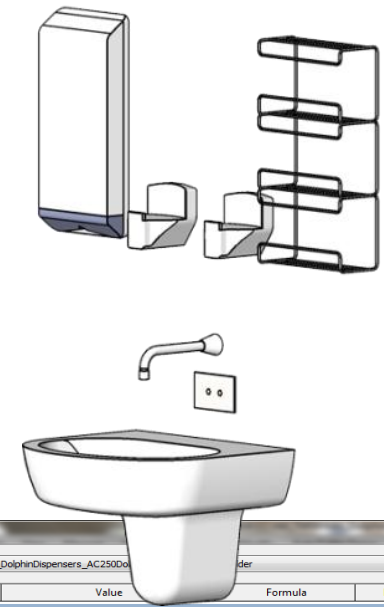
Typical providers of BIM content & property sets

- ❑ Industry content initiative

- ❑ Detailed properties for all

- ❑ International standard property set definition

- ❑ Industry standards applied



# Classification Systems: Ceiling Tile - 1 item, 3 facets



## Element

Constituent of a construction entity with a characteristic technical function, form or position.

## Work Result

A view of construction result characterised by type of work activity and resources used.

## Product

Product intended to be used as a construction resource.

# Classification Systems: National systems

Omniclass (US)	Uniclass (UK)	ANZ Systems
Table 21 <i>Elements</i> (UniFormat)	Table Ee <i>Elements</i>	ACCM <i>Element</i> classification
Table 22 <i>Work Results</i> (MasterFormat)	Table WR <i>Work</i>	Coordinated Building Information (CBI) NZI and NATSPEC <i>Work Results</i>
Table 23 <i>Products</i> (EPIC)	Table Pr <i>Products</i>	-

# buildingSMART

- **Needs to be industry wide**
- **Needs more New Zealand representation**
- **Get involved – members welcome**

**Thank you for your time and attention**