

New Business Models in Construction

Results of the Finnish BIM Survey 2013

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Building Information Modeling BIM

Definition

What?

”Building Information Modeling (BIM) is a digital representation of physical and functional characteristics of a facility. A BIM is a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition.”

- National Building Information Model
Standard Project Committee, USA, 2012



Building Information Modeling BIM Utilization in Construction Industry

What?

”Property and construction modelling aims to support a design and construction lifecycle process that is of high quality, efficient, safe and in compliance with sustainable development.”

- COBIM 2012



Benefits of BIM

Why?

BIM...

- **supports decision making** by comparing the functionality, scope and costs of concepts.
- **provides** energy, environment and life-cycle **analysis** for the comparison of designs.
- **visualizes design solutions.**
- **enhances quality-assurance** and data exchange which makes design process more efficient.
- **improves safety** during construction.
- **enables** the utilization of project and **building data** in facility management.



Finnish BIM Survey 2013

Survey facts

Now

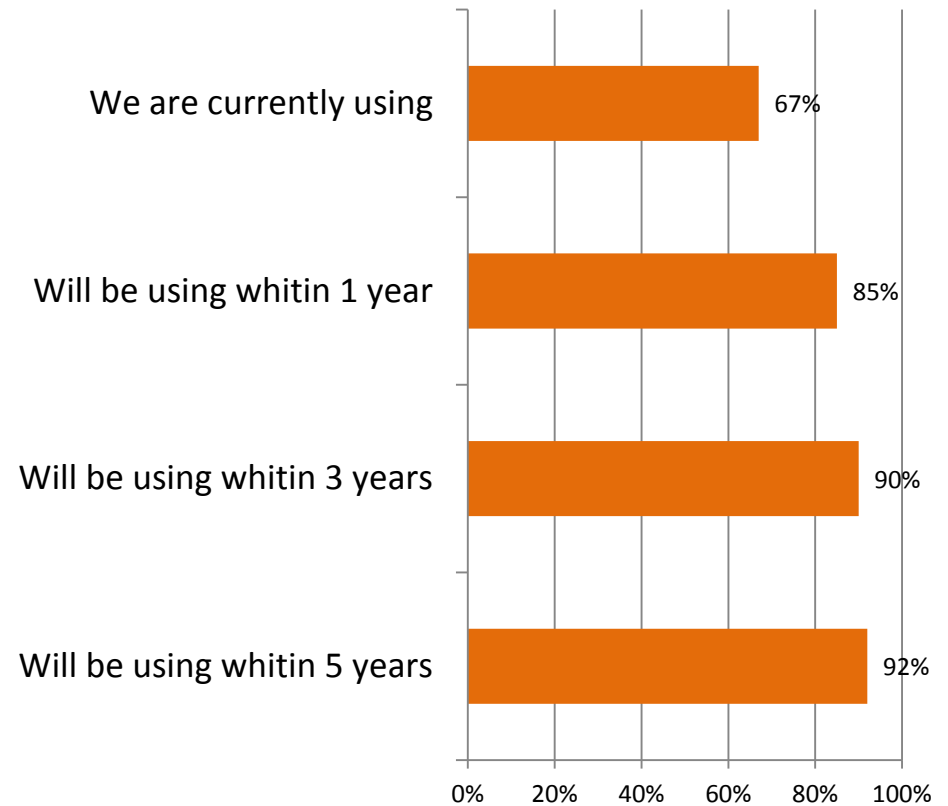
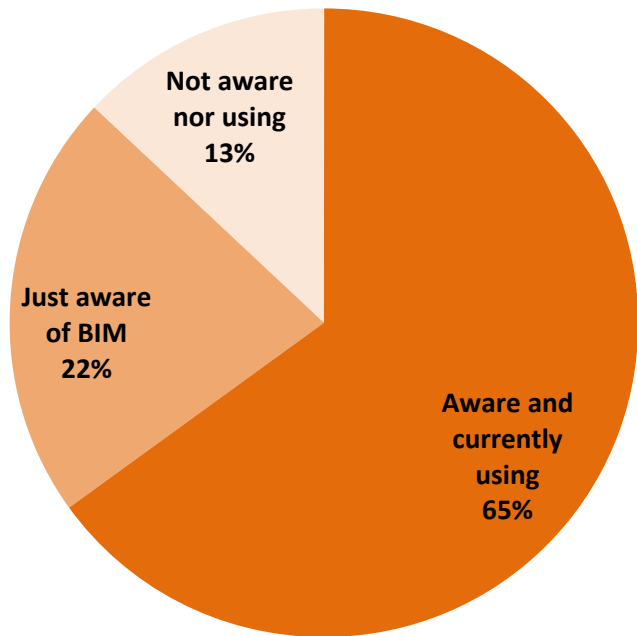
National BIM Survey 2013...

- surveyed the **adoption of BIM** technology and processes in Finnish construction industry.
- same survey template has been used in the UK, New Zealand, and Canada, which allowed to make **international comparisons**.
- The questionnaire originates from the UK where RIBA Enterprises published the National BIM Report for the third time in 2013.
- was done by the BuildingSMART Finland, the Building Information Foundation and NBS.
- received **over 400 answers** covering range of disciplines and company types in construction industry.
- was carried out in April 2013.



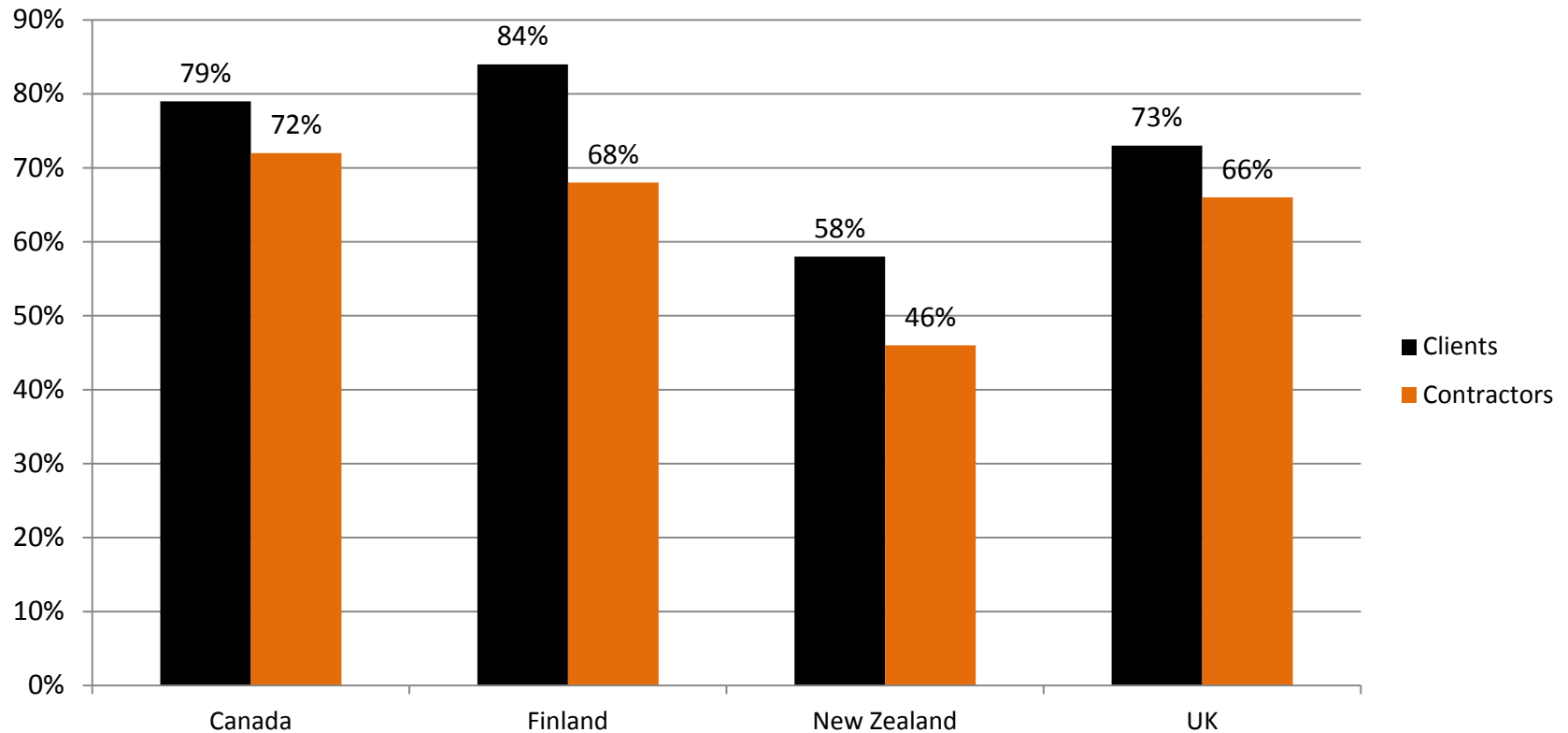
Adoption of BIM

Now



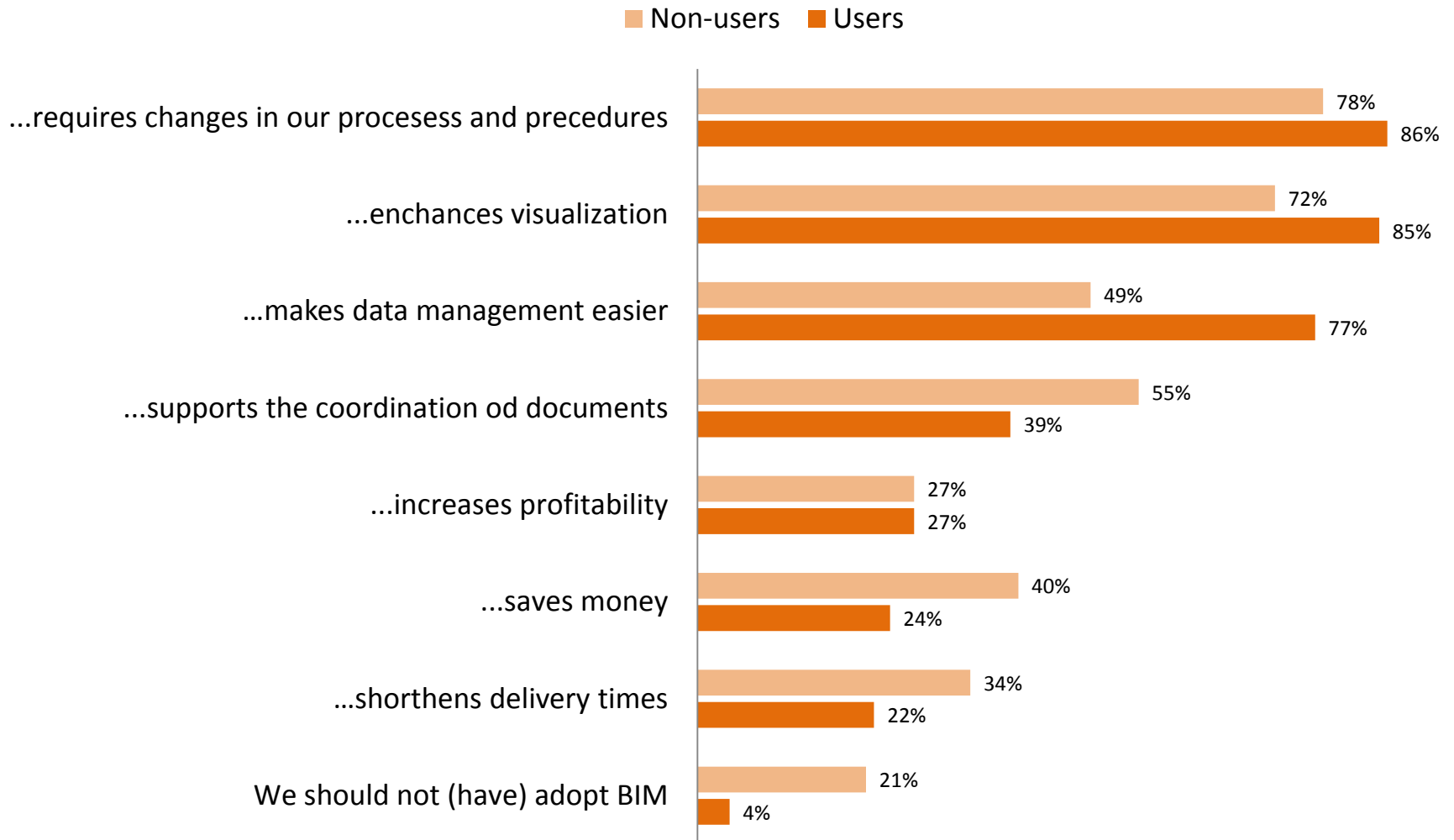
Main drivers for BIM adoption

Now



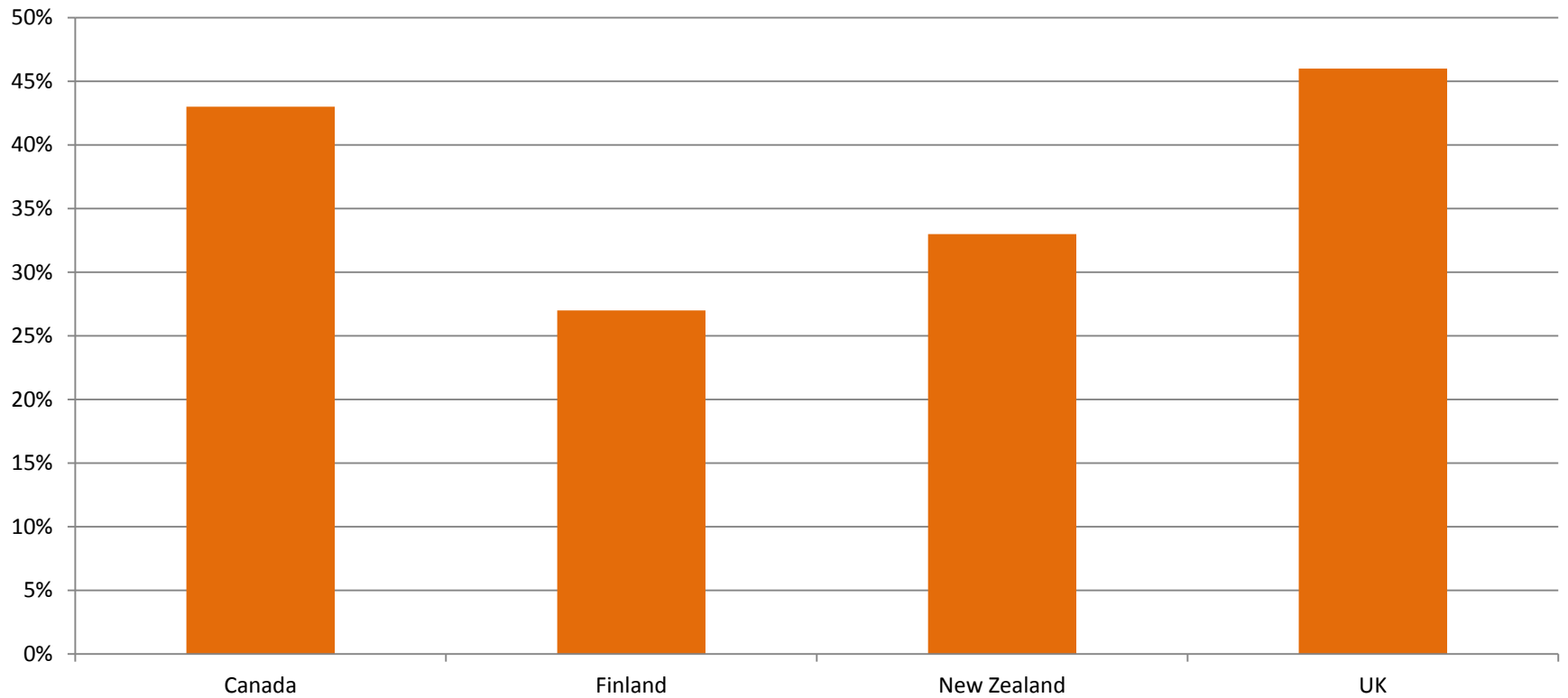
*In UK government has decided that BIM is mandatory on every publicly funded project by 2016.

Adoption of BIM...



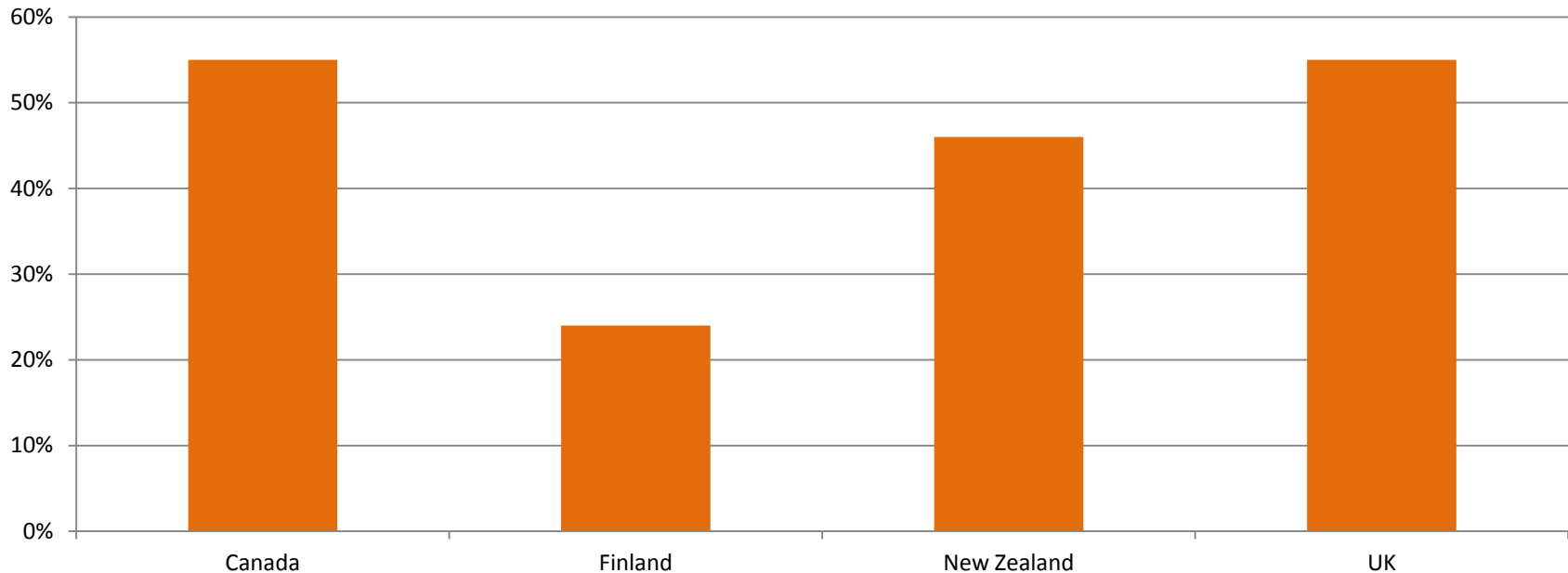
Claim: BIM boosts profitability

Now



Claim: BIM increases cost effectiveness

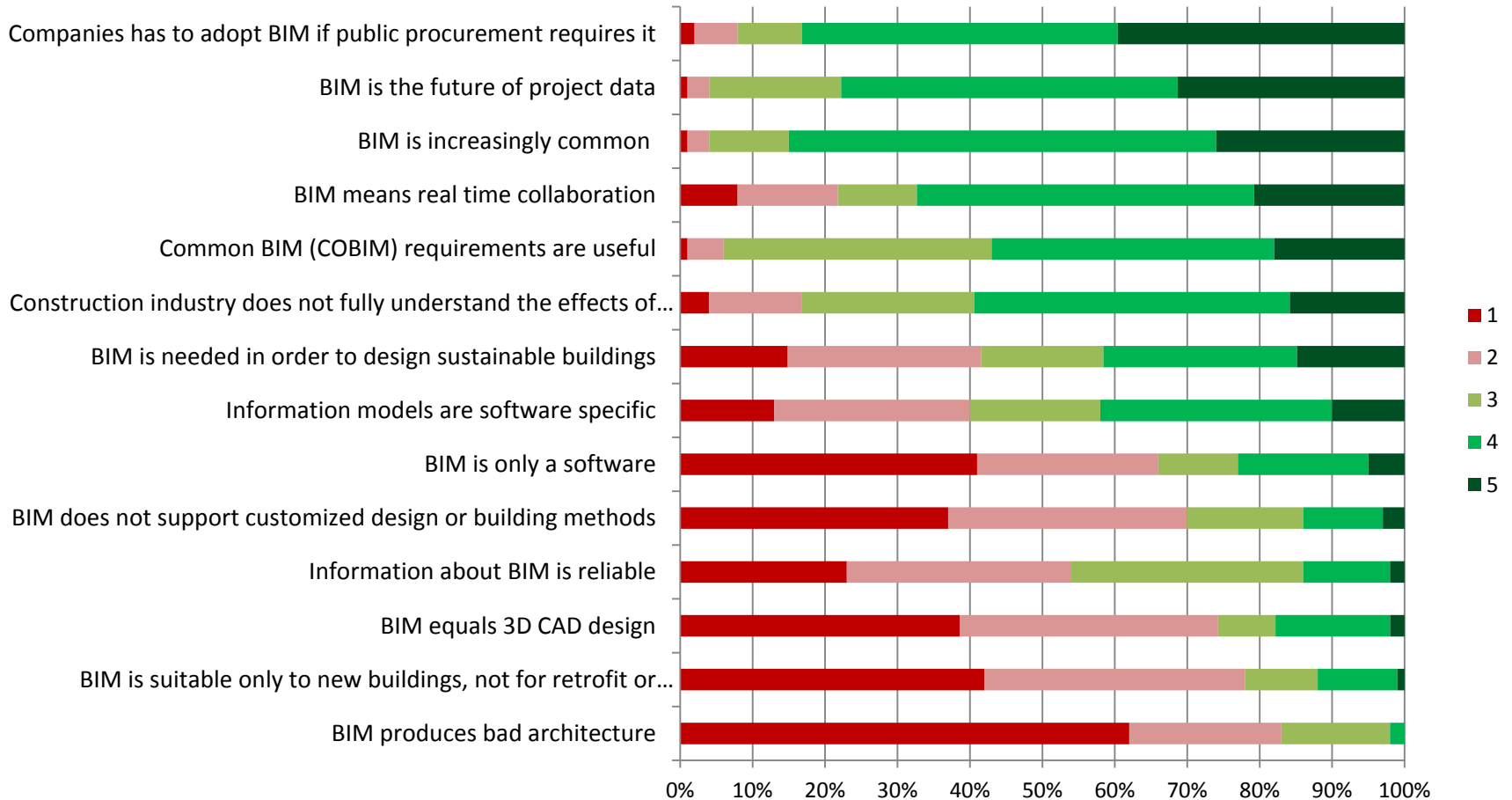
Now



Finnish respondents were the most doubtful. Perhaps this is due to seeing BIM predominantly as a technical solution, not as a business opportunity. Another reason might be that Finnish A/E/C consultants already operate quite efficiently, and a radical productivity increase is therefore hard to reach.

Attitudes towards BIM

Now



1 = totally disagree ... 5 = totally agree

Current State of the Construction Industry

Tomorrow



Paradigm of Construction Industry at the moment is

- cheapest price policy
- fragmented industry
- sub-optimization
- lack of R&D&I
- insufficient collaboration

→ Consequences are

- Increasing prices
- Quality problems
- Weak productivity
- Low-tech image
- Paper based processes

Are we ready to change?



Aims of the Future Construction Industry

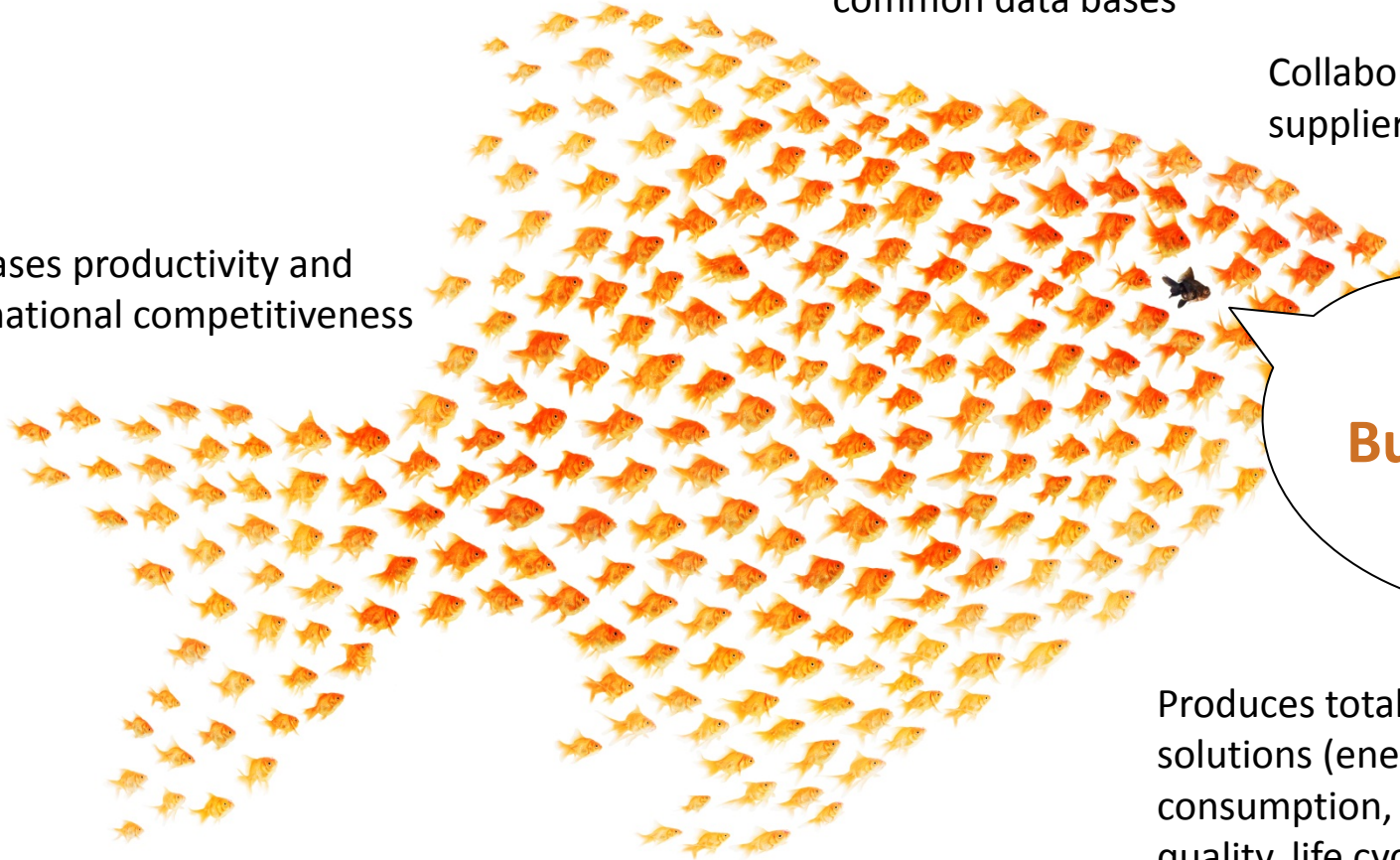


Competes with quality
delivering added value to
customers

Shares information and uses
common data bases

Collaborates with clients,
suppliers and designers

Increases productivity and
international competitiveness



Develops and innovates

Produces total optimized
solutions (energy,
consumption, indoor air
quality, life cycle costs,
functionality)



R&D&I

Contracts

Procurement

Standards

Libraries and databases

Software

Processes

Skills

Attitudes

Standards: COBIM 2012

Tomorrow



Common BIM Requirements include:

- General BIM Requirements
- Modelling of the Starting Situation
- Architectural Design
- MEP Design
- Structural Design
- Quality Assurance
- Quantity Take-off
- Use of Models for Visualization
- Use of Models in MEP Analyses
- Energy Analysis
- Management of BIM Project
- Use of Models in Facility Management
- Use of Models in Construction
- Use of Models in Building Supervision
- Also available in English:

<http://www.en.buildingsmart.kotisivukone.com/3>

R&D: Built Environment Process Re-engineering (PRE)

Tomorrow

R&D programme of RYM
(Built Environment Innovations)

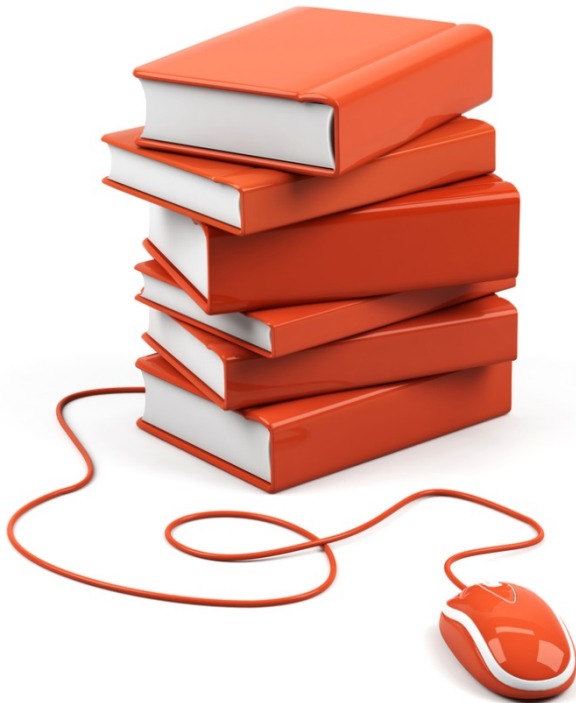
- BIMCOM
- BIMCity
- MODEL NOVA
- Drum
- Infra FINBIM
- New WoW

2010 - 2014

21 M€

37 Companies

6 Research Institutes



WP3: BIMCON

Building information model (BIM) based product data management in industrialized construction supply chain

Main Objectives

- To analyse and develop how the construction business processes must be changed to adopt BIM and ICT technologies in the construction supply networks for improving productivity and profitability



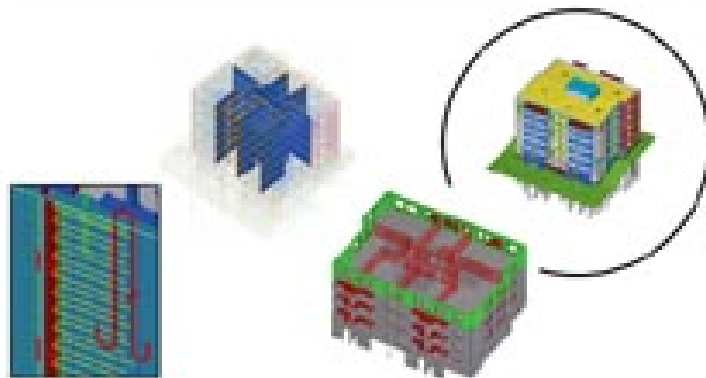
Key Results

- Methodology to manage supply chain information with BIM
- Usage of suppliers know-how and detailed design to improve constructability
- Systematics for product data management in construction



Industrial Impacts

- Better supply chain management: controlled, transparent and efficient
- New opportunities for business development and partnering
- Improved total productivity with computer integrated construction



BIMCity (**Simulation platform for IFC based technologies and solutions**) aims at

- defining and creating a common functional environment for land use and construction databases
- establishing information model as a way of conduct in land use planning (e.g. building inspection, planning, interaction with concerned parties)
- improving exchange of information between different sectors of planning and thus accelerating processes concerning land use
- developing an open environment for business concepts serving land use and construction.

Work in BIMCity is strongly based on pilot projects, which represent different levels of planning starting from regional dimensions through city plans down to construction of individual buildings, as well as interaction and data exchange between these levels.

R&D: MODEL NOVA

Tomorrow

The aim of the Model Nova work package (**New Business Model based on Process Network and Building Information Modeling, BIM**) is to produce a business model and an operating culture for the built environment that exploit BIM and support sustainable development. The potential of BIM is studied from the standpoints of behavioral sciences and business processes.

The Model Nova work package studies the added value generated by BIM-based virtual construction, simulations and visualizations for the customer's and sector actors' strategic and operational level decision-making processes and activities.

The research plan also includes evaluating the need to modernize work processes, know-how, demands on the software industry, and systems. Management of a process that exploits BIM requires new forms of communication and collaboration between the parties of the value network.

R&D: DRUM

Tomorrow

The aim of the DRUM (**Distributed Transactional BIM**) work package is to develop transaction-based data transfer methods and technology that enable utilization of BIM in actual building processes.

The key themes include software architecture that supports transaction-based data management, transaction distribution systems and application interfaces.

DRUM work package questions the prevailing idea of managing information with a single centralized model. What if we had a decentralized model based on agreed data structures and data transfer solutions? Decentralized information management, using cloud technology, may open totally new markets for information management.

Programme will produce objective research data on the basics and boundary conditions of decentralized information management and tests the feasibility of the concept (proof of concept).

The DRUM work package co-operates internationally with Georgia Tech.

R&D: Infra FINBIM

Tomorrow

The vision of the Infra FINBIM work package is that in 2014 the big infrastructure owners will order only BIM-based service.

This research program aims to convert the entire sector to BIM-based project procurement and implementation and infra asset management. Participation of the biggest infra client (Traffic Agency) and leading sector companies in the research program will create sufficient critical mass for bringing about a change in the sector.

It consists of three sub-work packages: development of the procurement procedure, development of interfaces and standards and new design and building processes.

Research projects related to the above include:

- InfraDiamond: Infra processes that exploit BIM
- Bridge and automation: Development of bridge building, repair and maintenance automation
- INMAP-2: BIM-based infra asset management
- InfraBIM guidelines

R&D: NewWoW

Tomorrow

The NewWoW (New Ways of Working) work package is aimed at providing understanding of the changing nature and demands of knowledge work and their impacts on facility management and productivity of organisations.

New work space solutions are being developed using BIM in response to the increasing interactvenes and project nature of knowledge work.

The central themes are:

- Demands of work and changes in it
- Impact of ways of working and work space arrangements on productivity and sustainable development
- Use of BIM in management that support new ways of working

R&D: BIM and Safety Management

Tomorrow

Field trial	Results
1. Site layout plans and crane reach visualization related to a crane collapse	BIM-based site layout models (spatial arrangements, temporary facilities and structures), and visualizations of risk areas related to any possible crane collapse at site
2. Visualization of wall demolition procedures	BIM-based model for visualizing wall demolition work.
3. Modelling of safety railings	BIM-based detailed models with 3D guardrail components
4. 4D-visualization of floor form work with needed falling prevention solution	BIM-based 4D model of form work for one concrete casting area/segment
5. Expert analyses with the aid of virtualised construction site	Experiment of visualizing the falling prevention plan in multi-wall virtual reality room (CAVE)
6. Automatic safety analysis using BIM technologies	Knowledge about automated safety checking of buildings to be built using model checker software (SMC)
7. Site safety communication and BIM	Pilot use of LCD information displays on a construction site for conveying safety relating information.



Construction is a challenging industry.

A large, light green graphic consisting of several overlapping, curved arrows that form a circular, clockwise path, serving as a background for the central text.A grey silhouette of a suspension bridge and a city skyline is visible in the top right corner of the slide.

CIB World Building Congress 2016

Intelligent Built Environment for Development

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