



HOW TO UTILISE BIM IN ENVIRONMENTAL CERTIFICATION

**NOV ARC CONFERENCE 2.10.2014
TALLINN, ESTONIA**

RAMBOLL

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Ramboll Pääkonttori,
Kööpenhamina

RAMBOLL GROUP



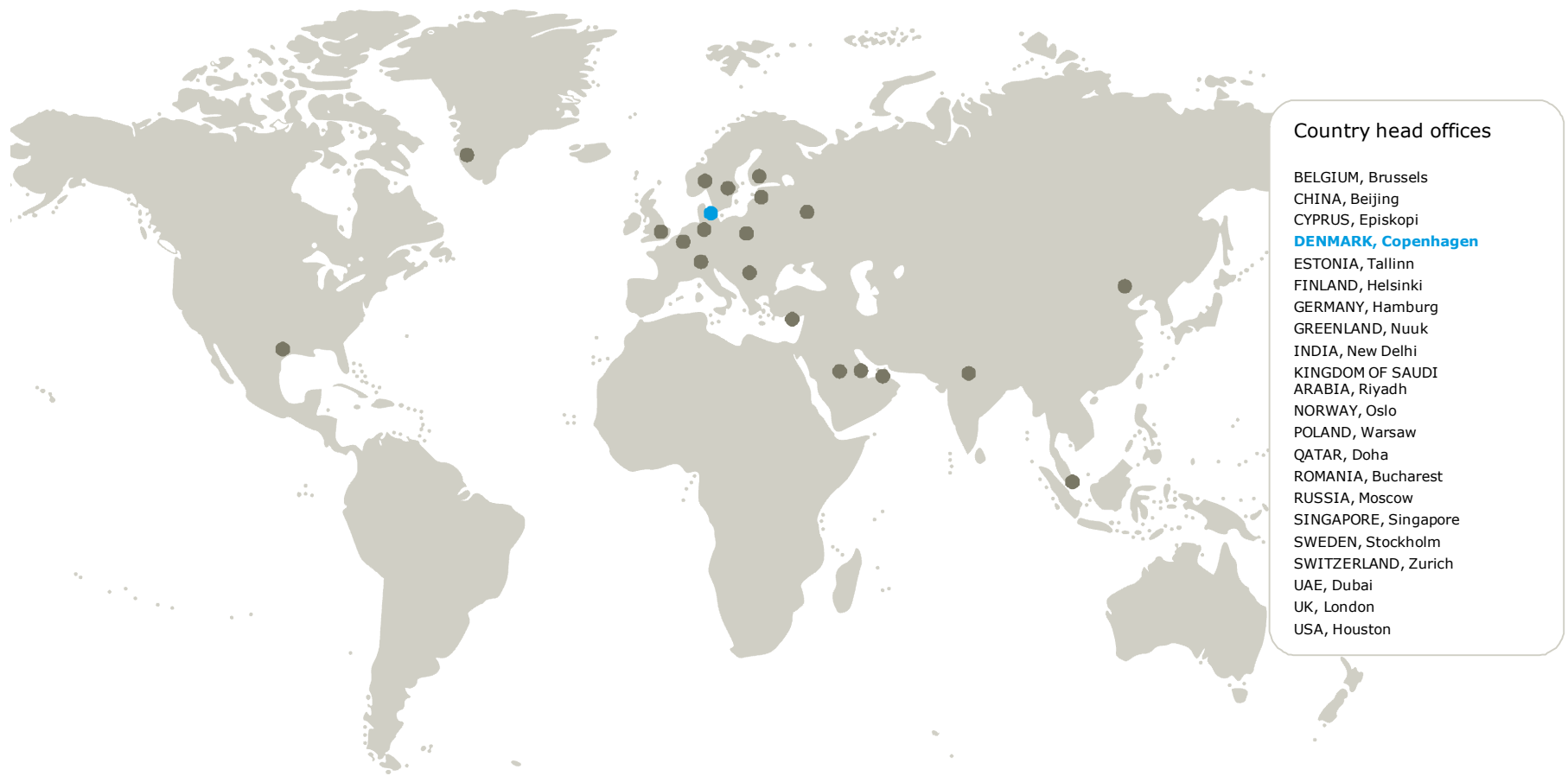
Leading Nordic and 4th biggest design and consulting company in Europe

n. 11 000 experts in 200 offices in 21 countries

Founded in Denmark in 1945

Turnover 1,0 mrd € (2013)

INTERNATIONAL PRESENCE



FIVE SECTORS

Buildings

- Real estate and project development
- Area development
- Concept development
- Structural design
- Mechanical design
- Architectural design
- Real estate consulting
- Green building
- Indoor environment
- Building Information models (BIM)
- Fire and safety

Project management

- Infra management
- Asset management
- Project management
- Project development
- Building management
- Risk management
- Site supervision

Infra and transportation

- Geotechnical design
- Urban planning
- Municipal engineering
- Transportation
- Aviation
- Landscape design
- Rail transportation
- Harbours
- Bridges
- Road and area transportation design

Water and environment

- Waste management
- Waste water management
- Land-use and planning
- Contaminated soil
- Ground water
- Environmental consulting
- Environmental laboratory and analytics
- Environmental assessment (YVA)

Management consulting

- Research and assessments
- Training
- Organisations and process development
- Strategies and management



Keskustakirjasto
 Rambollin rakennuttamispalvelu,
 rakenne- ja sähkösuunnittelu
 Kuva: ALA-Arkkitehdit Oy

BUILDINGS – SERVICES IN FINLAND

Development services

Real estate and area development

Construction and project management

Cost calculations

**Concept development
 Workplace development
 Environmental, real estate and life-cycle strategies**

Design services

Structural design

Mechanical design

Architectural design

**Building Information Model
 Indoor environment
 Fire and safety design
 Acoustics design
 Lighting**

Consulting

Energy and technical consulting

Real estate management

Green building

**Technical and environmental Due Diligence
 Environmental certifications
 Commissioning management
 CO2 calculations**



TOPICS

Trends Shaping Green Building Development

Environmental certifications and BIM

BIM tomorrow

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TRENDS SHAPING THE DEVELOPMENT OF GREEN BUILDING

1. Legislation

Tightening legislation on energy efficiency

2. Business models

More holistic and cross-functional approach

3. Technology

Readiness to implement new technology, dynamic simulations

4. Knowledge

From cost savings and basic benefits to more sophisticated strategies

5. User in focus

From contractor-driven to user-driven projects

6. Location

Location and accessibility are growing topics in overall sustainability

TENANTS ARE SHAPING THE BUILDING MARKET TO GREEN

- The growing role of Corporate Responsibility Reporting
- Sustainable image brings new business opportunities
- Efficient and flexible spaces favoured
- Location, accessibility, and facilities as part of business activities emissions
- Readiness to pay small premium



RESPONSIBLE OWNERSHIP

- Green building = Better control and knowledge on operating and costs
- Better yield and rentability, stable cash flow, resale value
- Enable and support tenant's green actions



RENOVATING FOR EFFICIENCY AND FLEXIBILITY

- Set and follow up the target, Commissioning
- Investment profitability? Demolish or repair?
- Lack of knowledge of best practices, each case is unique
- Green results more value compared to a conventional renovation

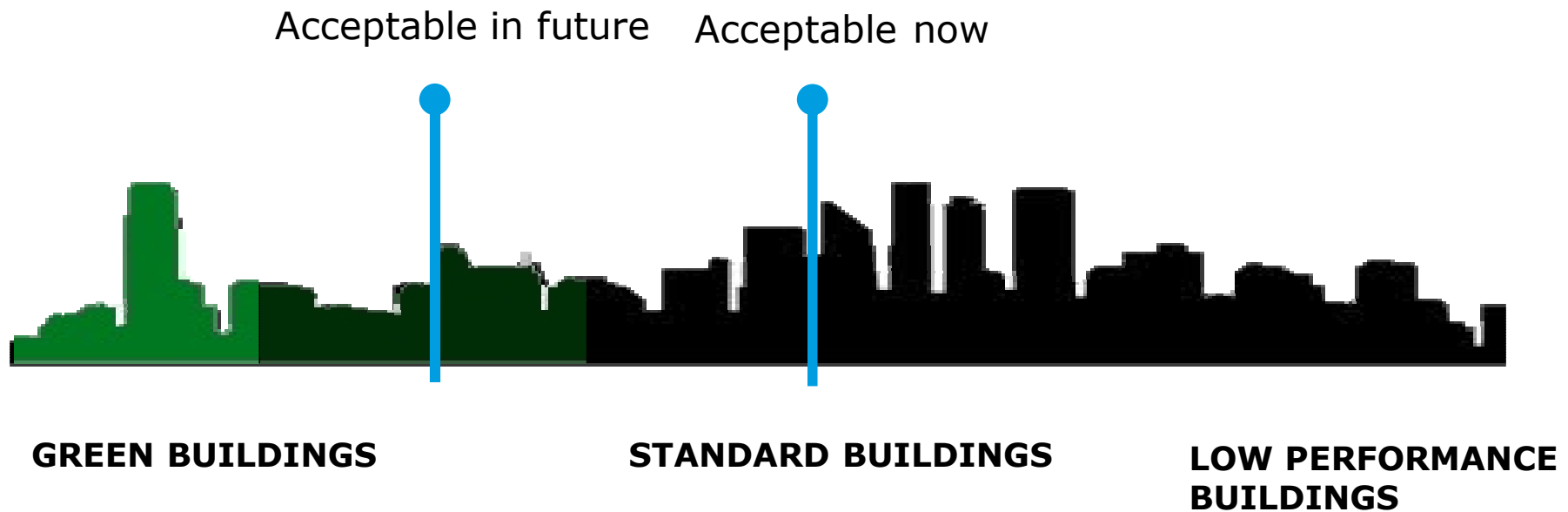


SUSTAINABLE AREAS AND COMMUNITIES

- Green field vs. Brown field
- Set and follow up the target, zoning, energy, transportation...
- Engolve multidiciplinary engineering and planning teams
- Enable and support networks between public, private, and 3rd sector to build-up sustainability oriented communities



FUTURE OF GREEN BUILDING – LOTS OF OPPORTUNITIES!



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ENVIRONMENTAL CERTIFICATIONS (LEADERS)



LEED, Leadership in Energy & Environmental Design. Internationally recognized. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

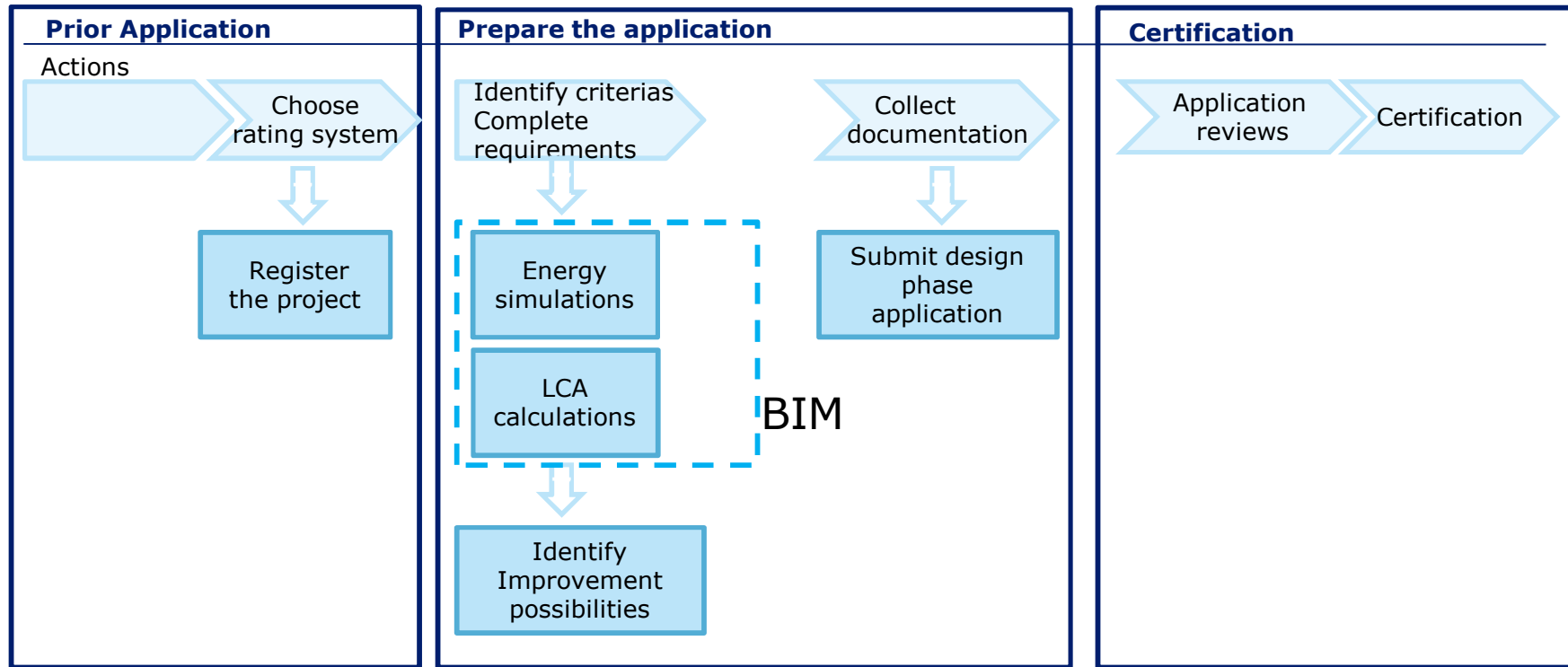


BREEAM®

BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance. It encourages designers, clients and others to think about low carbon and low impact design, minimising the energy demands created by a building before considering energy efficiency and low carbon technologies.

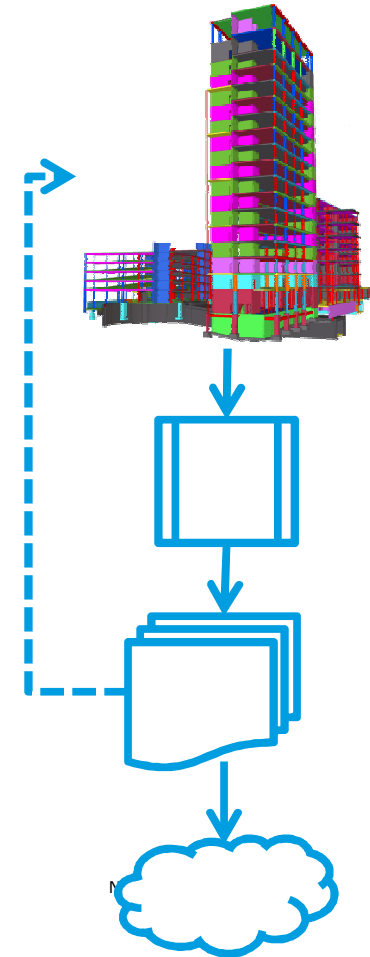
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CERTIFICATION PROCESS

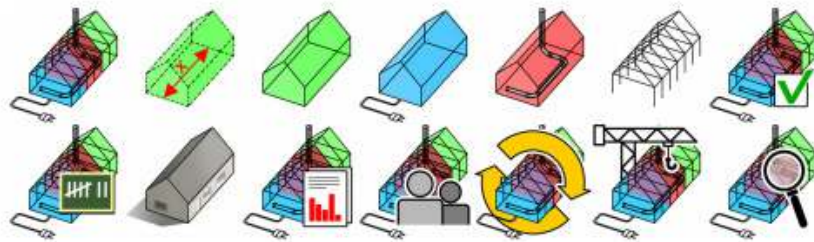


BIM IN SUSTAINABILITY DESIGN OF BUILDINGS

- The data included in BIMs enables to use models in various assessments, including sustainability of buildings
 - Energy efficiency
 - Comfort design
 - LCA assessments
- BIM allows to expand the sustainability assessment from individual building component to the entire building and life-cycle



EFFECTIVE USE OF BIM REQUIRES COMMON PRACTICES



COBIM Common BIM Requirements
2012

v1.0

COBIM, is based on the BIM Requirements published by Senate Properties. The update project was funded by Senate Properties in addition to several other real estate owners and developers, construction companies and software vendors.

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

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- Series 1: General part
- Series 2: Modeling of the starting situation
- Series 3: Architectural design
- Series 4: MEP design
- Series 5: Structural design
- Series 6: Quality assurance
- Series 7: Quantity take-off
- Series 8: Use of models for visualization
- Series 9: Use of models in MEP analyses
- Series 10: Energy analysis
- Series 11: Management of a BIM project
- Series 12: Use of models in facility management
- Series 13: Use of models in construction

TOPICS

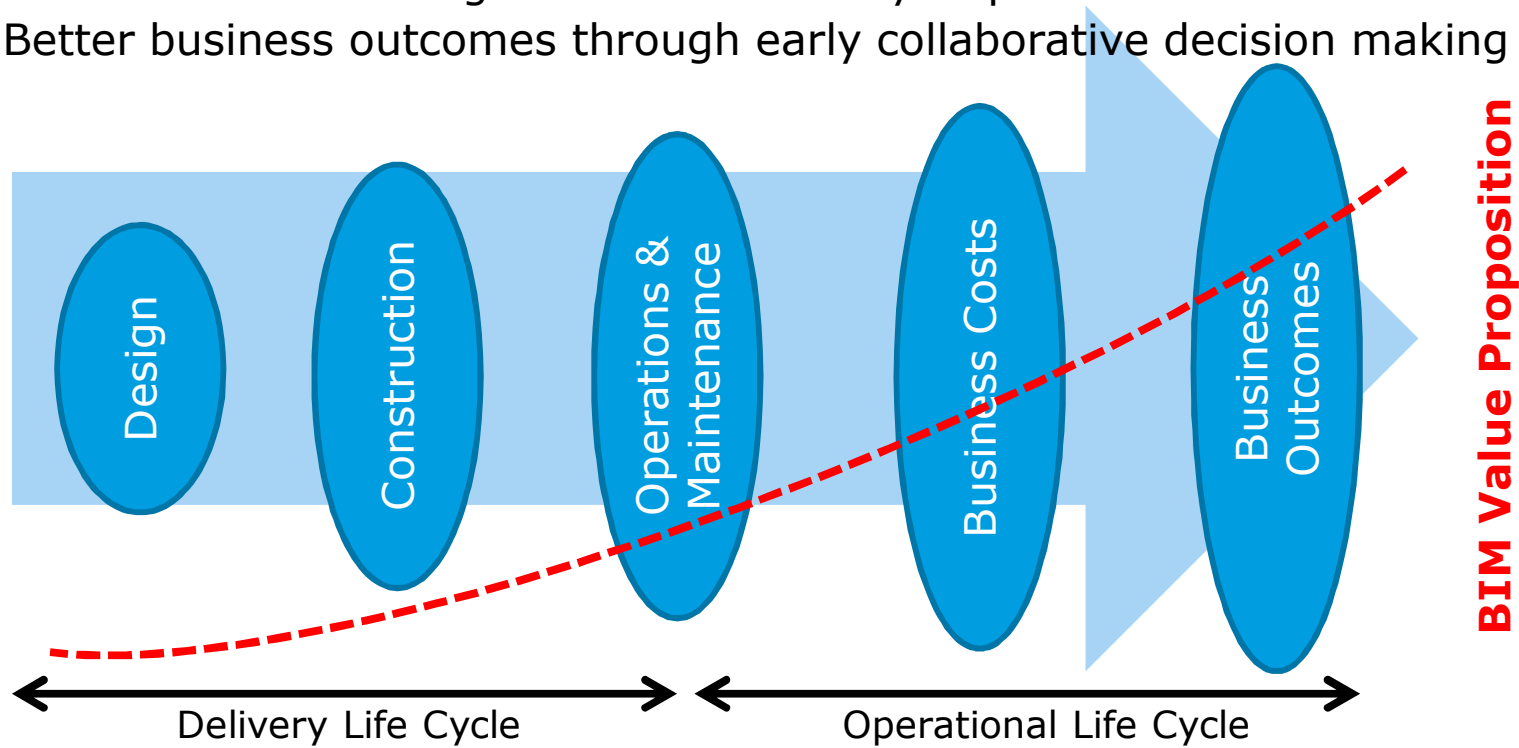
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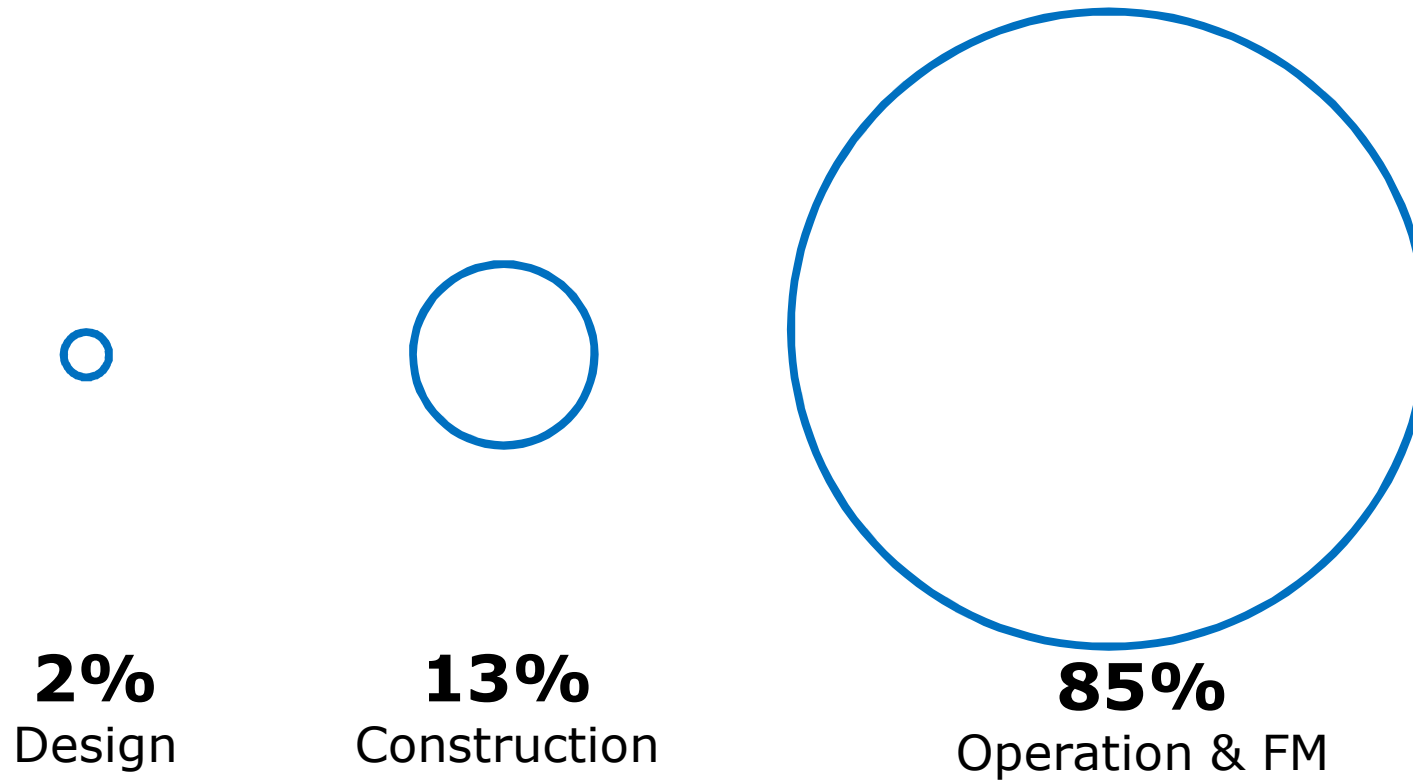
BIM tomorrow

LIFE CYCLE PROCESS

Greater understanding of the entire life-cycle process
Better business outcomes through early collaborative decision making



WHY? – BUILDING LIFE CYCLE COSTS

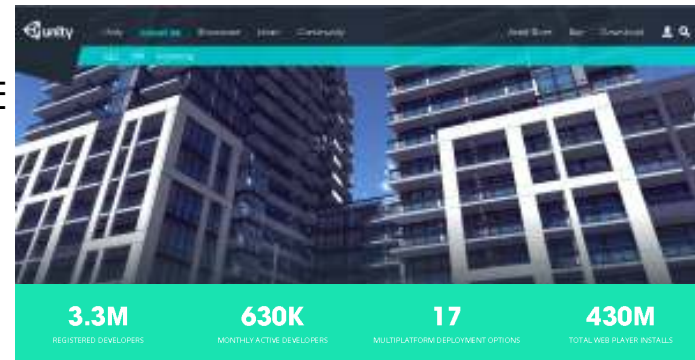


WHERE TO PUT BIM TO MAX THE OUTPUT?

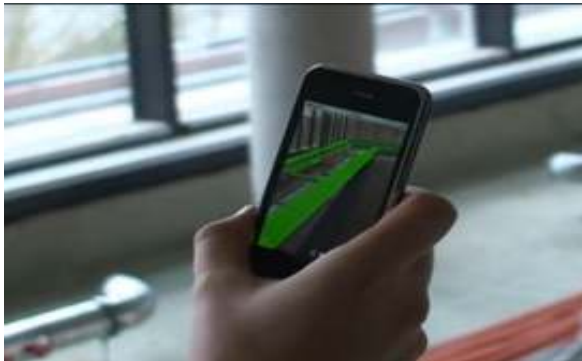
CAVE



GAME ENGINE



MOBILE AR



WEAR AR



AR = Augmented Reality

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THANK YOU!

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