Different perspectives on Facilities Management to incorporate in BIM

CIB Facilities Management Conference

21st – 23rd May 2014

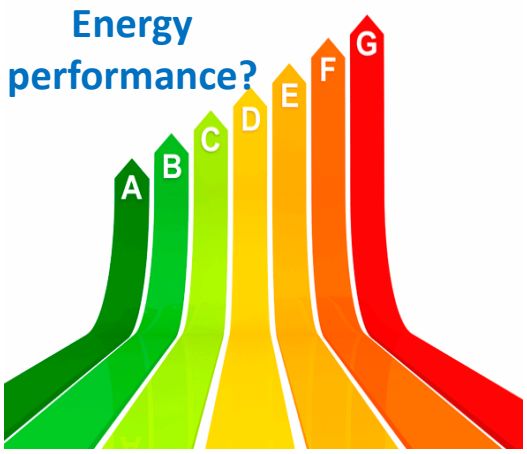
By: Mohammad Mayouf
Co-authors: Prof. David Boyd and Prof. Sharon Cox

Outline

- Background
- Purpose of the research
- Research approach (methodology)
- Results and analysis
- Proposed framework
- Conclusions and future development

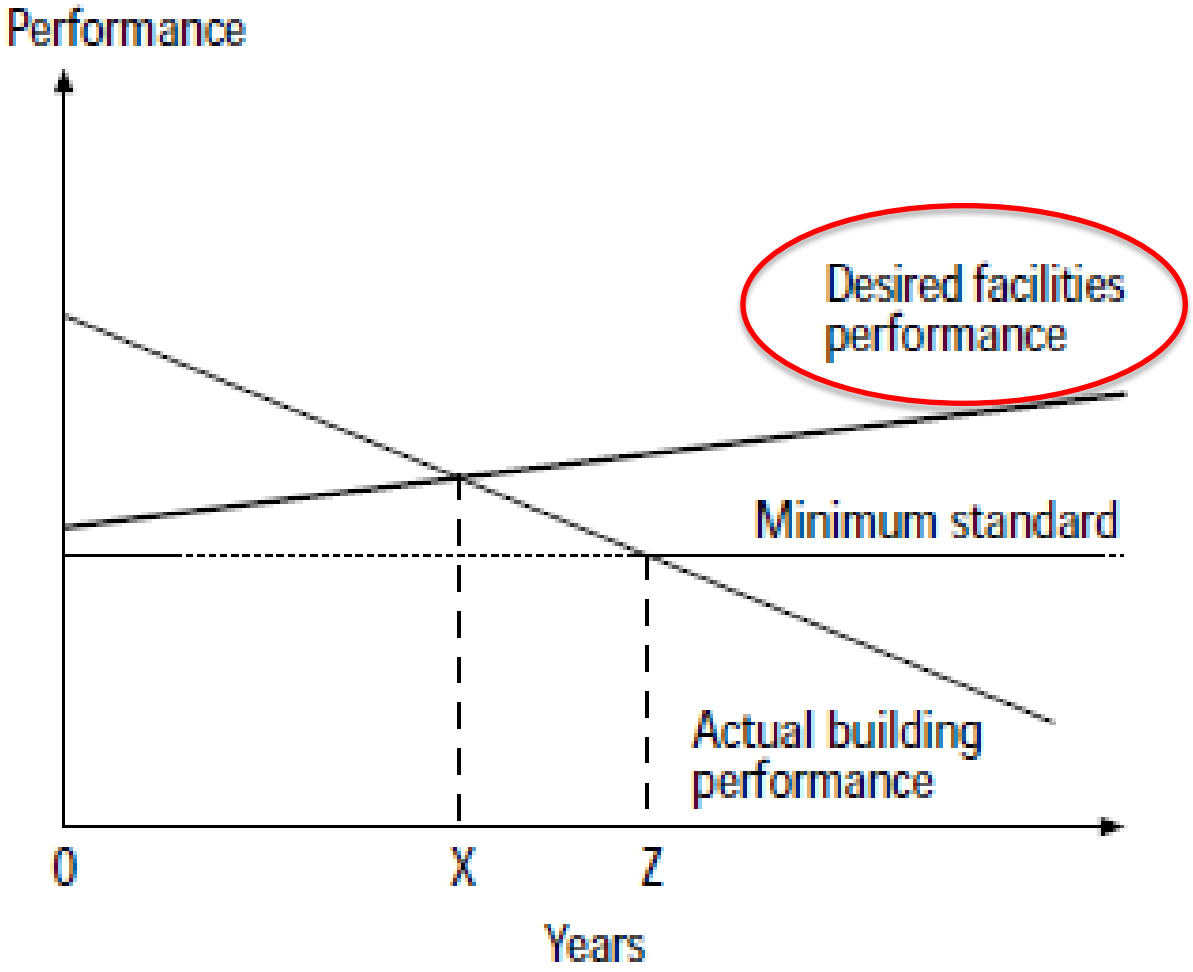
Background

- Buildings do not perform as intended.
- Building performance is a complex concept to be incorporated into building design.
- The inaccurate evaluation of building performance results in an inefficient building operation.



Building Performance

Why FM ??



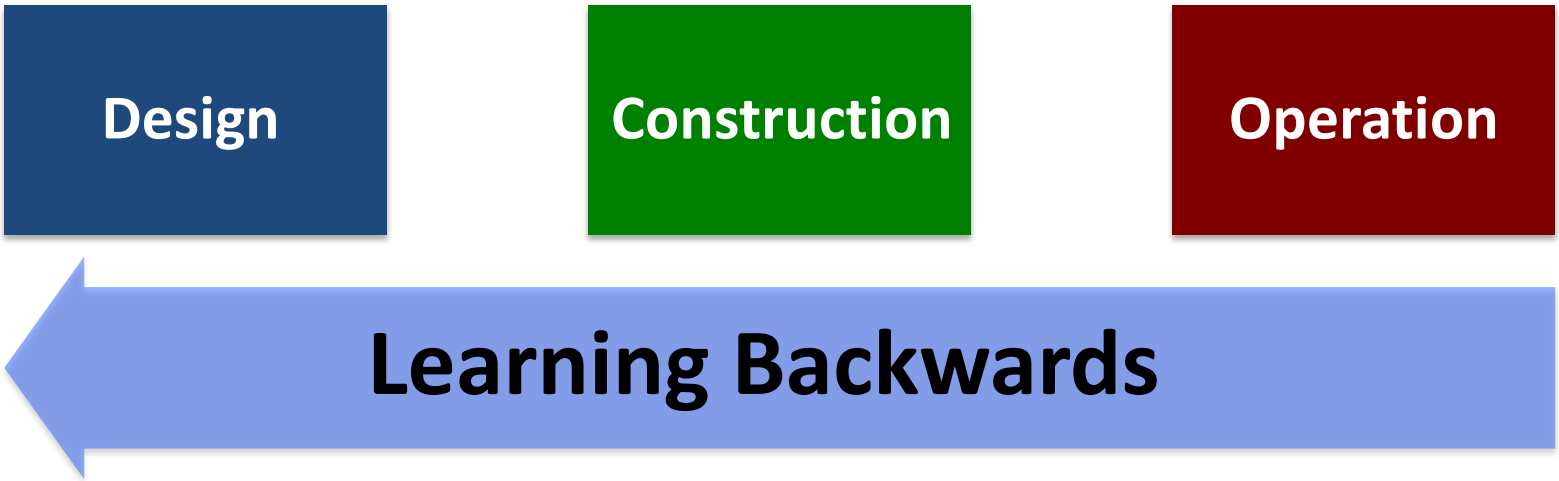
Source: Douglas (1996)

The need for multiple perspectives

Operational phase

Purpose of the research

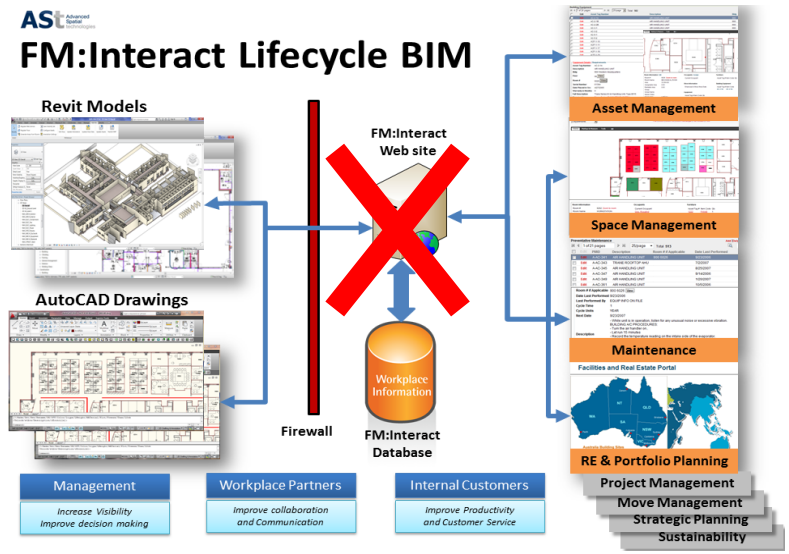
- The aim of this research is to review how the early integration of FM within BIM can enhance building performance using multiple perspectives.



Why BIM ?!

BIM Models

Staff, students, others



Research approach

Multiple perspectives approach

Based on soft systems approach (acknowledges the systemic complexity)

Using case study to conduct the proposed approach

The study was conducted on a newly operating university building in the United Kingdom

Conduct interviews with the research participants

Three teams were involved in this study: building delivery, facility management and building occupants

Results and practical implications

The implications of the results are discussed based on three parameters

Research participants

Building delivery team

- Project Director
- BIM Coordinator
- BREEAM Assessor
- Architect (BIM Manager)

Facility management team

- Facility Manager
- Building Services Supervisor

Building occupants

- Senior Lecturer
- Senior Lecturer
- Deputy Head of a School

The interview focus

- Concept of building performance.
- Facilities management role for building performance.
- BIM value to support building facilities.

Results and Analysis

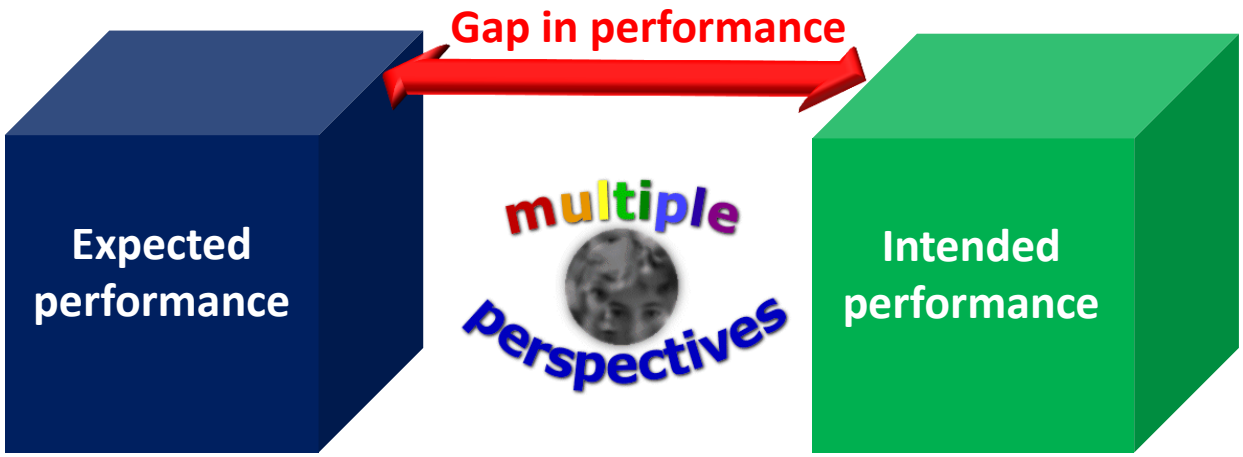
Role / Criteria	Concept of building performance	Facilities management role for building performance	BIM value to support building facilities
Project Director	It is about maintaining all levels of understanding of control and maintenance of the building's energy and operation on the long term.	Impacts building life cycle.	Energy assessing and maintenance information.
BIM Coordinator	The performance of the building is to do with energy efficiency and maintenance.	Flexibility and adaptability for the building.	Space and maintenance information.
BREEAM Assessor	It is based on energy efficiency and how the building can function adequately to meet the needs of the users.	Delivering sustainability.	Facilities information.
Architect (BIM Manager)	It is about maintaining the balance between aesthetics, robustness, durability, thermal comfort, levels of natural and artificial light, energy usage, flexibility to suit changing uses, acoustic performance, capital budget, on-going maintenance costs, clarity of building diagram and organisation of spaces to avoid clutter of imposed signage, integration of services with structure and building fabric and accessibility of building and its uses to all.	Occupants' satisfaction and maximize building assets for the most efficient usage.	Allows optimisation of layouts when modelling required access for plant maintenance or replacement which in return allows maintenance to be planned without unnecessary disruption to the users.

Role / Criteria	Concept of building performance	Facilities management role for building performance	BIM value to support building facilities
Facility Manager	The building needs to function in a way that keeps the occupants comfortable and it also depends on from what perspective you look at it.	The middle connection between occupants and building design team.	Ease of information retrieval especially for operation and maintenance manuals. It would help if BIM can find the specification of a particular item. Benchmarking the flexibility to accommodate changes.
Building Services Supervisor	Everything in the building should be in working order and what the customer needs is there for them.	Maintain the building performance for a long period and they represent the undercover power of the building.	It would show the facilities which can or cannot be removed from a space. Engaging BMS (building management system) with BIM.

Position / Criteria	Concept of building performance	Facilities management role for building performance	BIM value to support building facilities
Senior Lecturer	The way that the building performs as a result of the planning process by the various ranges of disciplines which in total should allow me to do my work.	It should contribute towards the health and safety for the occupants. It occupies a major role in the working environment.	Occupants should be informed about the how the building is functioning. Occupants can contribute towards some of the health and safety issues associated with the design of the building. Space settings should be informed to the occupants.
Senior Lecturer	It has to support my needs as an occupant to do the job assigned to me.	Facilities should be where you actually need them. Should not have any adverse effect on occupants' health and safety. Occupants should be informed about who to tell about any issues arising.	Should allow occupants to know which facilities are movable and which ones are fixed. Check the facilities locations and whether they conflict with the access pathways within the building. Noise level of facilities within open spaces.
Deputy Head of a School	It depends on what the building is going to be for; there are several parameters to measure like feeling, heat comfort, and connectivity between spaces among the building.	Functionality and the quality of its work. Should be interactive with the users of the building. People should have an easy access to feedback about facilities.	Some noise levels from heating and cooling systems. Occupants to be informed about certain aspects within the building. Facility management should interact with users in a way that allow them to report useful information back to the designer.

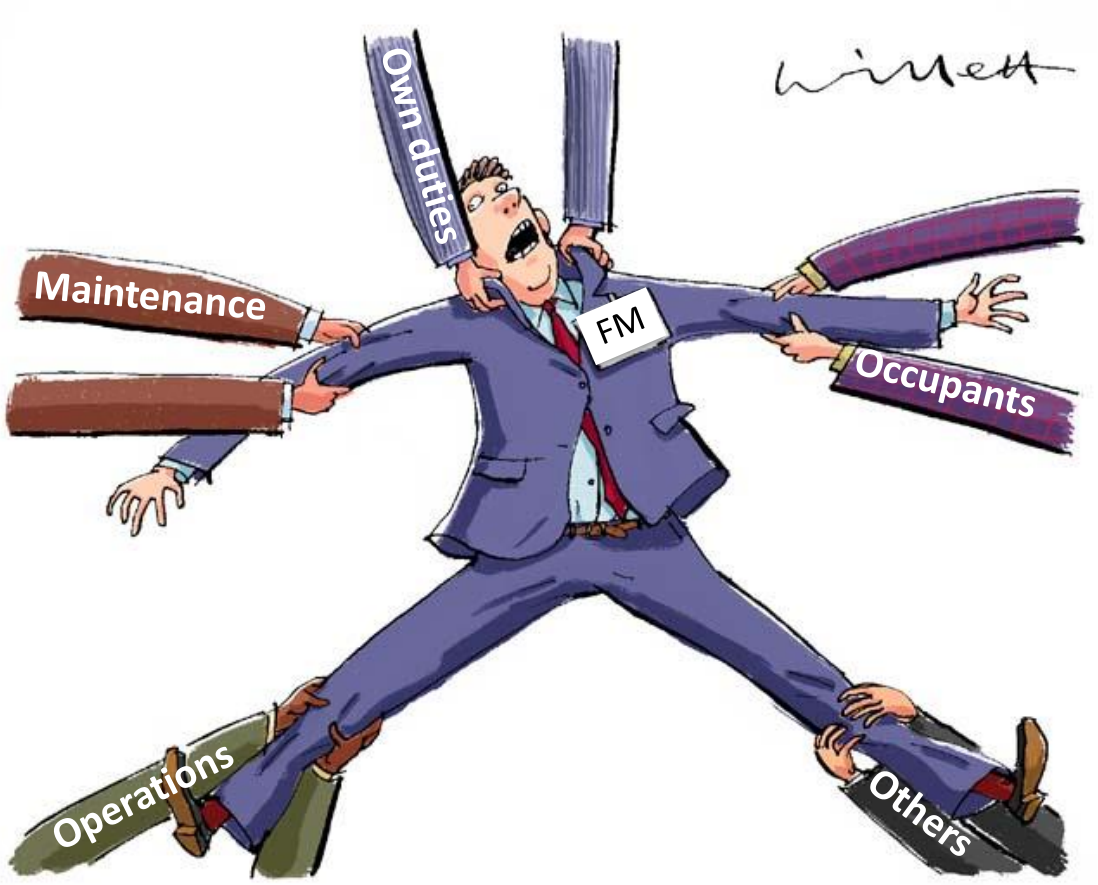
Concept of building performance

- Building performance is seen in different ways.
- The success of a building is multi-dimensional.



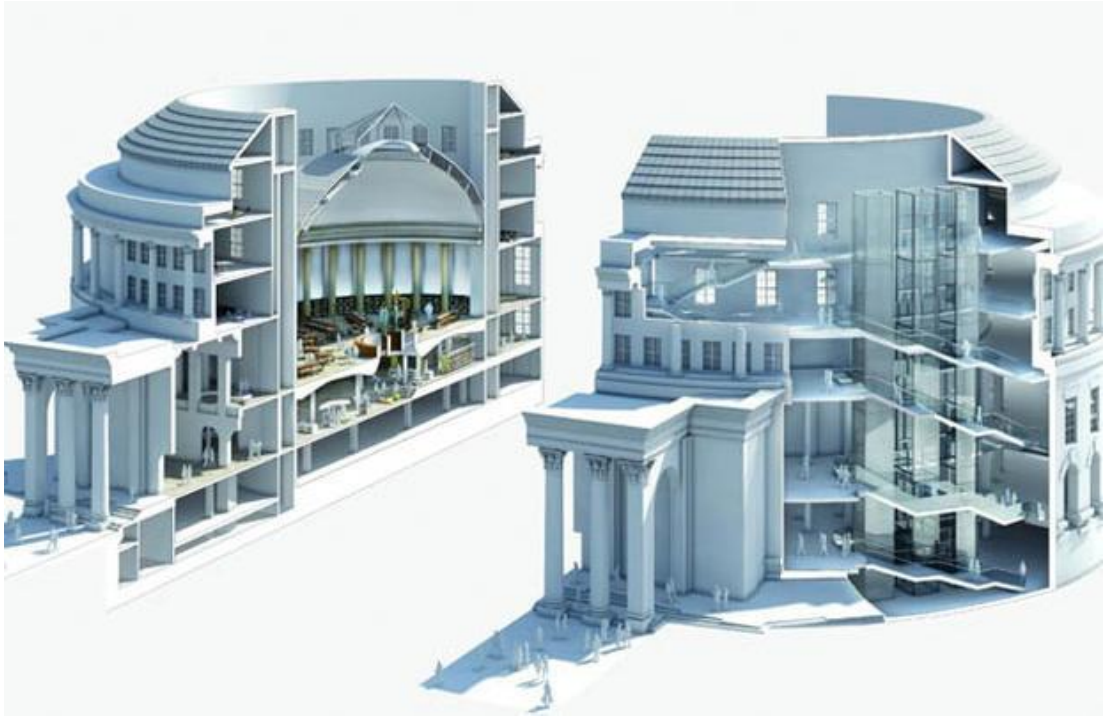
Facilities management role for building performance

- There is a need to consider FM at the design stage.

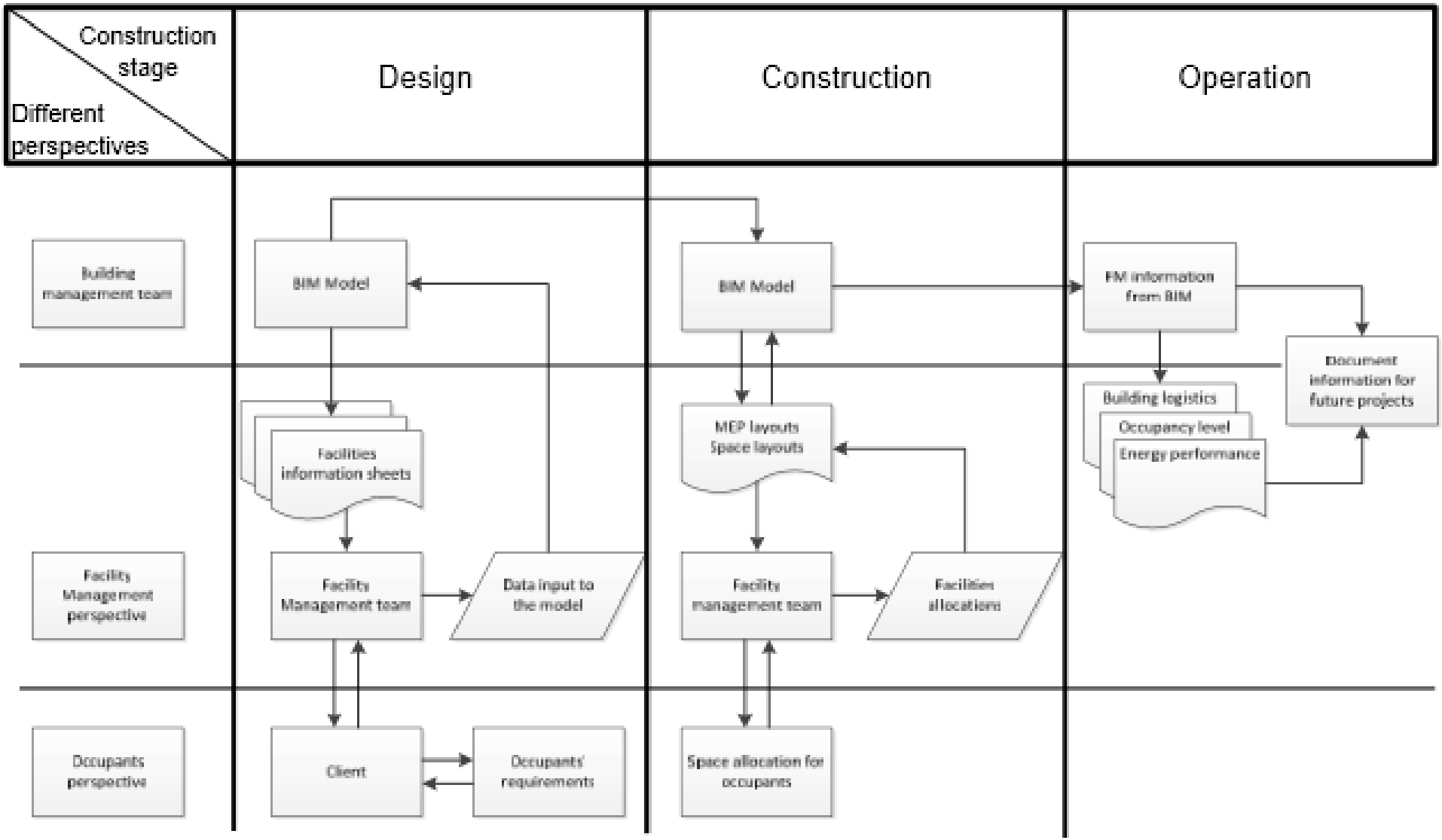


BIM value to support building facilities

- BIM has the potential to bring more effective information for FM team, but that require them to be more involved at an early design stage.

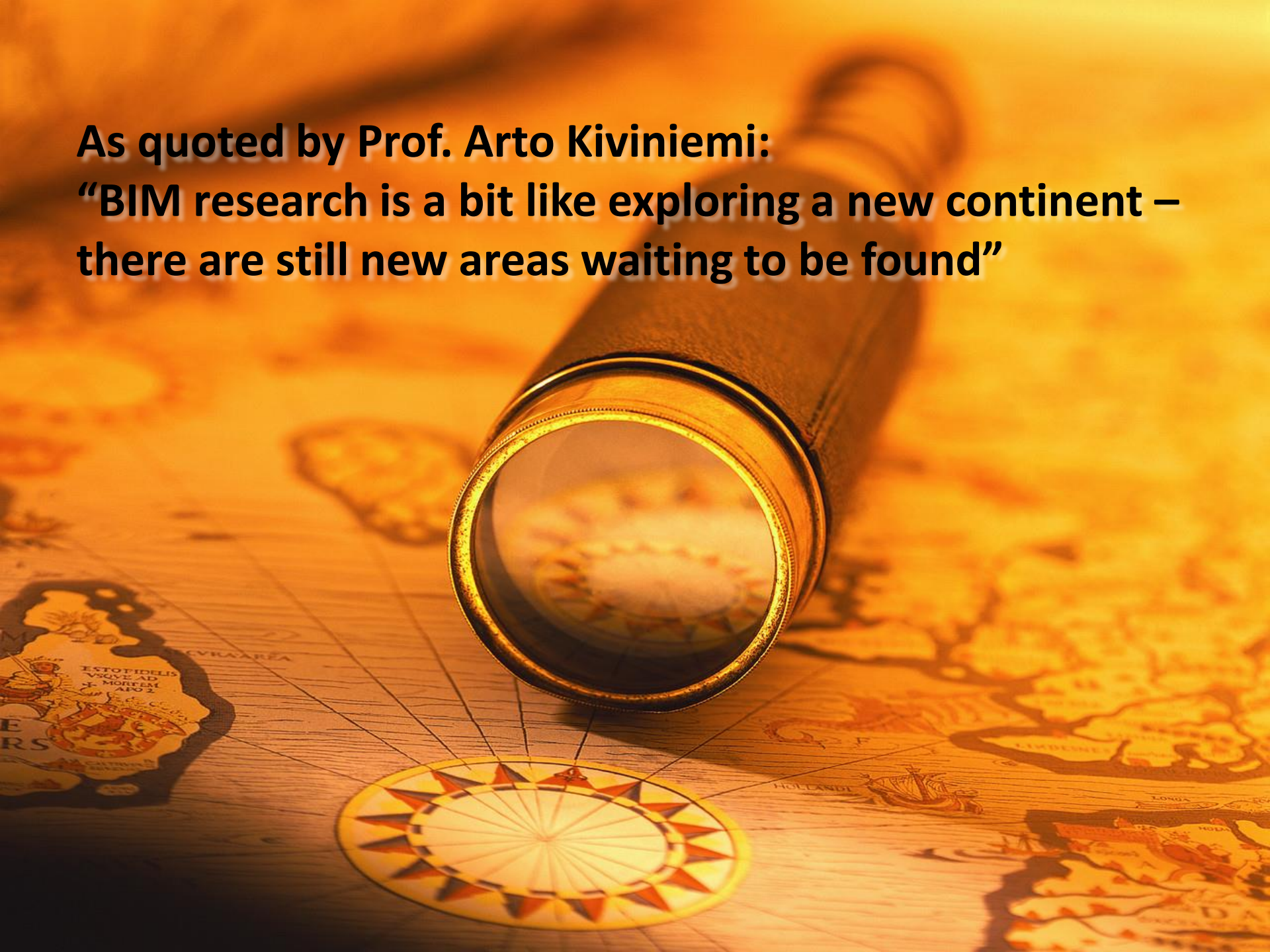


Proposed framework



Conclusions and future development

- FM plays a major role through the life cycle of the building.
- BIM provides the opportunity to involve the FM team at an early design stage.
- The practical implications of this research will be to incorporate information needs for facility managers in the BIM model.


As quoted by Prof. Arto Kiviniemi:
“BIM research is a bit like exploring a new continent – there are still new areas waiting to be found”

Thanks for your attention

Have a nice day !!!