BIM DELIVERY & FACILITY MANAGEMENT

BIM Equity

BIM Workflow Guide

BIM DELIVERY & FACILITY MANAGEMENT

Introduction

Welcome to the fourth book in the BIM Workflow series. In the following chapters we will cover, everything need for you to master the basics of working with BIM based facility management. Furthermore subjects regarding classification, ICT (Information and Communication technology), Facility Management standards and organizational change, will be explained for you to apply in your own organization.

This instalment is part of a larger collection of four books taking you through the entire BIM Workflow, from on-site laser measurements to quality control using IFC to large-scale facility management and much more.

Before starting this course please make sure, you are using the latest version of the ArchiFM application by visiting http://downloads.vintocon.com and using a 64-bit Windows machine. The version of the ArchiFM application determines which version of ArchiCAD you will be using.

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WELCOME TO THE FACILITY MANAGEMENT WORKFLOW GUIDE PART I

Part I will take you through subjects related to classification and its use for facility management. At the end of the chapter, we will sum up by looking into what standards your organization have to consider creating/implementing to ensure optimal use of BIM-based facility management (BIMfm).

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1.1 Classification

Classification systems have had an increased focus over the years, with many documented uses for the Architectural, Engineering and Construction industry, but with limited focus and documentation for the use in the facility management (FM) and operation and maintenance (O&M) industry. This tendency have been expressed in the two resent classification system developments in Denmark, namely Dansk Bygge Klassifikation (DBK – 2006) and Cuneco Classification System (CCS – 2015). As far as 2015, the only real attempt of creating a classification system supporting the FM and O&M industry has been Forvaltningsklassifikation (LBF – 2013), developed entirely for the purpose of helping facility managers classify and navigate in all the important data associated with their building portfolios, this with focus on supporting their core business.

These are all Danish examples of classification; other countries have similar or more advanced classification systems to offer like OmniClass and UniClass. When working with facility management, classification should not be advanced, and looking at classification for this part of the building industry, it is advised to consider two aspects:

1. How to structure and define classification for building components and technical installations?
2. How to structure and define classification for spatial spaces, to ensure consistency and transparency across the building portfolio?

This way of looking at classification simplifies the upcoming work of defining the structure, by separating two very different focus areas; Space Management and Operation and Maintenance.

The following subjects and examples take root in the Danish Forvaltningsklassifikation, and is ment for inspiration only.

1.2 Classification of building components

First rule of thumb is to make the classification identification (id) recognizable to both the end user and the facility manager. This is achieved by using id's that simply describe what type of component they relate to and where the component is placed (terrain or building). To differentiate between the placements the letter t for terrain and b for building could be used.

A classification example of a Grundfos ALPHA2 N pump placed in a utility room could be as follows:

b	: for placement in building
t	: for technical installation
hea	: for it being a pump in a heating system
pum	: for it being a pump

The complete classification id is then bt.hea.pum – Grundfos ALPHA 2 N.

Another example of classification could be a façade loadbearing wall, id as follows:

b	: for placement in building
c	: for it being a part of the buildings construction
wal	: for it being a wall

The complete classification id is then bc.wal – Concrete 220 mm.

By creating this form of classification id's for your building components and technical installations, you get the opportunity to easily identify the id and make searching for specific components in the facility management systems database very easy, across your entire building portfolio. If need be, it is always possible to add a sequential number to the classification id, this will give you the opportunity to identify one specific pump from another in the same room, when there is not any graphical representation at hand.

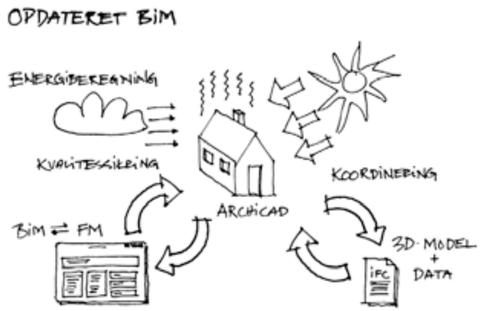
Remember, with BIM-based facility management, we do always have a room to relate our technical installations, which eases the identification process.

1.3 Classification of spatial spaces

There is two stakeholders involved in the definition at use of classification of spatial spaces; the user and on-site operator of the building and the facility manager responsible for parts or the entire building portfolios spatial spaces. These two parties have different needs and understanding of the use of spaces, which is why it is important to maintain a certain amount of flexibility.

The user and on-site operator has defined the different spaces, based on their given function, e.g. storage room, classroom etc. The facility manager has defined the different spaces, based on their initial function and usage based on a common term.

It is important for the Facility Manager to use a common term for spaces because there is a certain incongruity in the way users and on-site operator is defining names for spaces and numbers, in the individual building. A storage room could in one building, be named Book archive and in another just Archive or Library depot. This naming makes sense to the end users and the on-site operator, but for the facility manager it creates identification and space management problems. This is why a common room type classification is needed, so that drawings can show the end users desired room names and numbers, and the facility management database cahn collect these under one specific defined room type id.



1.4 FM-standards to be determined

Apart from building component classification and room type classification, there is also a set of more generic terms/expression and hierarchical principals to consider. These provide the organization with greater transparency on work processes and data together with possible references to the corporate standards used in the Facility Management industry and thereby potentially benchmarking. These subjects are described (for the Danish market) in literature such as Håndbog i Facilities Management 3rd edition 2011, and for the international business in e.g. Technology for Facility Managers – The Impact of Cutting-Edge Technology on Facility Management 2013 and BIM Handbook 2nd edition 2011. The following will provide references and pointers, and will not explain all subjects in detail.

Seeing that we with BIM-based facility management set focus upon the physical building itself, represented by the digitalized BIM-model, it is evident for the organization to define a structural way of looking at their real estate portfolio, hierarchically. This because BIM-based facility management systems structure buildings, so that every object or building component has a specific building placement on room level. This is preferred due to enhanced localization of technical installations and building components, together with future component reference to Operation and Maintenance (O&M) tasks (both preventive and break down).

1.4.1 The portfolio hierarchy:

In a Danish context, it is only logical to create the portfolio hierarchy based on how real estate data is registered and documented in the legal Bygnings- og Boligregistret (BBR) register, which is a database that facilitates all basic real estate data in Denmark. This database stores real estate data in the following hierarchy: address → land registry number (matrikelnummer) → real estate registry number → building section number → spatial space.

This hierarchy is what the BIM-based facility management system has to resemble, in an easy to use way. This also automatically sets requirements to how we structure and divide/section our BIM-models during the digitalization planning and process. This due to the building owner often having multiple land registry numbers related to one single address, and just as often have multiple buildings and even building sections related to one land registry.

The portfolio hierarchy in the BIM-based facility management system will then designed as follows:

1. Country/State/Nation
2. Region/Municipality
3. City
4. Address with land registry number
5. Real estate registry number and building name
6. Building section number
7. Stories
8. Rooms

The above hierarchical definition will apply in the same way in any nation, with a legal real estate database such as BBR.

1.4.2 Defining O&M terminology:

In terms of Operation & Maintenance (O&M), the industry operates with different types of O&M tasks, defined by the origin of the task. By origin is meant the time of recognition of the task to be carried out and whether it is planned or a registered damage on-site.

There is three categorizations of O&M tasks that are commonly used, and therefore worth considering when defining your FM-standards:

- Preventive Maintenance
- Restorative Maintenance
- Break Down Maintenance

Preventive Maintenance: is used for O&M tasks carried out before the performance of the building reaches below the defined standard for the specific organization.

Restorative Maintenance: is used for O&M tasks carried out for buildings that are set to be refurbished with the aim to raise the performance level of the building to a defined minimum, as-built or as new relative to the time of age.

Break Down Maintenance: is used for O&M tasks carried out based on a user request when building components, technical equipment etc. breaks down and are to hinder or damage the buildings quality and performance.

Source: Håndbog i Facilities Management, 3rd edition 2011, page 135

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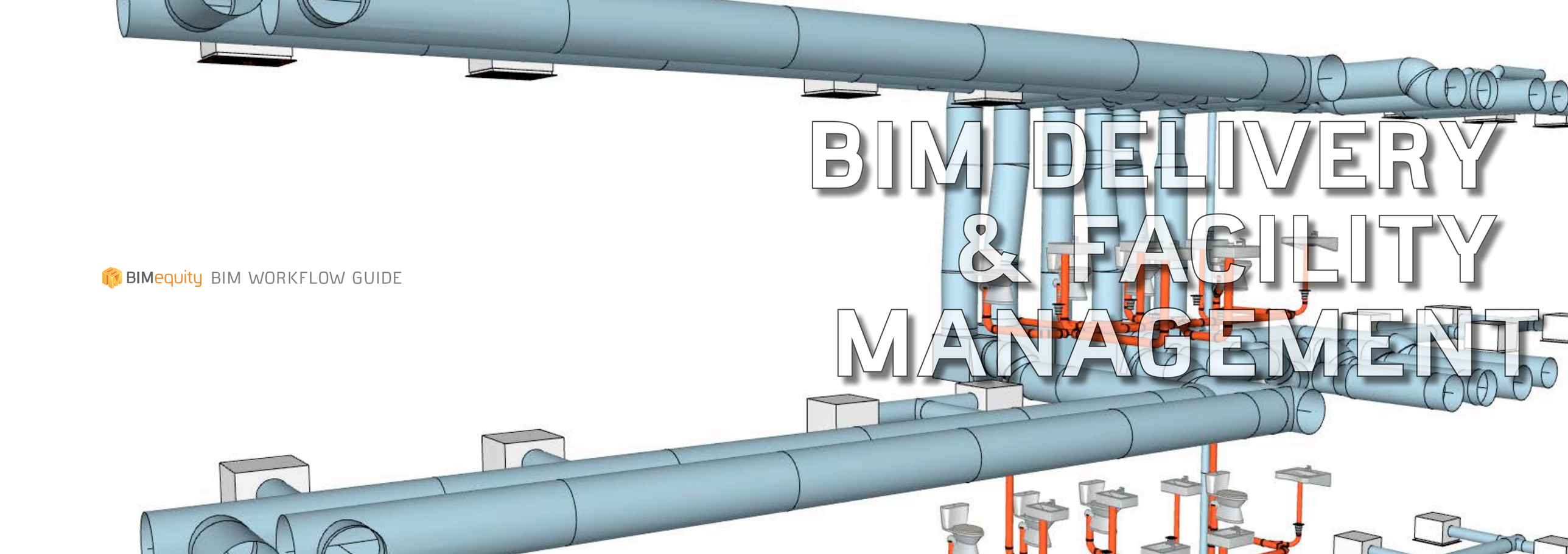

DIGITALIZATION

WELCOME TO THE FACILITY MANAGEMENT WORKFLOW GUIDE PART 2

Part 2 will take you through subjects about how a well-defined digitalization plan can create huge added value in terms of money saved on the yearly facility management expenses, create better processes, improve building quality and reuse of data for the facility management processes.

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DIGITALIZATION

2.1 Why digitalize your real estate portfolio

Using BIM-models for facility management has many benefits, and thus provides a fair amount of arguments for why a digitalization could be a solid strategy in enhancing the organizations core business.

Some of the upfront benefits provided by a digitalization process:

- Each building becomes the center of attention when planning maintenance tasks, refurbishments and space management.
- The facility management data is based on actual building data such as square meters.
- Quantities, functions and areas becomes even more precise.
- Facilitates an enhanced focus on the actual building due to on-site inspections.
- Greatly shortens the process of setting up the facility management database.

Some of the long-term benefits provided is:

- BIM-models and structured FM-databases facilitate enhanced workflows and transparency across the organizations work processes.
- Gives the possibility to continuously update and distribute the 2D drawing material internal and external.
- Gives the possibility to easily distribute 3D models, 2D drawings and quantity takeoffs to the end user, both on paper and on technological artefacts such as iPads, smartphones etc.

2.2 What is needed to get the benefits

A feasible real estate strategy with a clear vision and reachable milestones aimed towards a final goal, including thoughts about what new BIM-based facility management system to use.

Creating this form of strategy is often a task that requires competencies that are not present in the given organization. The required information needs and wishes are present, but the competencies to facilitate the creation of a solid and worked out strategy is not. This is why it is recommended to either hire a suited consultant or employ a person with the required competencies. Subjects to include in a real estate strategy related to BIM-based facility management and digitalization is:

Looking BIM-based facility management, a good place to start when setting up a strategy for digitalization, is with space management and end user involvement. Consider what information you have representing your buildings now, and what data you need as an outcome to support your goal and your end users. Available data and end user involvement is key to success. John Kotter has created a simple but intuitive model describing 8 steps to take towards success when transforming your organization or implementing new ways of working: *(1) post implementation, (2) during implementation, (3) past implementation.*

1. (1) Establish a sence of urgency
2. (1) Forming a powerful guiding coalition
3. (1) Creating a vision
4. (2) Communicating the vision
5. (2) Empowering others to act on the vision
6. (2-3) Planning for and creating short-term wins
7. (3) Consolidating improvments and producing still more change
8. (3) Institutionalizing new approaches