

Building Information Modelling (BIM) in Facility Management

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Building Information Modelling in operation and maintenance

Building Information Modelling (BIM) has revolutionized the operation and maintenance of buildings by providing a digital platform that enables effective maintenance throughout the building's lifecycle.

Preventive maintenance planning: BIM allows facility managers to digitally model and visualize the building's various systems, equipment, and components. This capability helps in identifying potential maintenance issues before they occur and allows for proactive planning of preventive maintenance tasks. For example, a BIM model can highlight the lifespan of different parts and facilitate scheduling replacements or repairs in a timely manner.

Asset management and tracking: BIM can be utilized to create a comprehensive asset management system. By tagging and linking the building's assets to the BIM model, facility managers can easily track and manage the maintenance history, warranty information, and operational requirements of each asset. This enables efficient monitoring, tracking, and scheduling of maintenance activities.

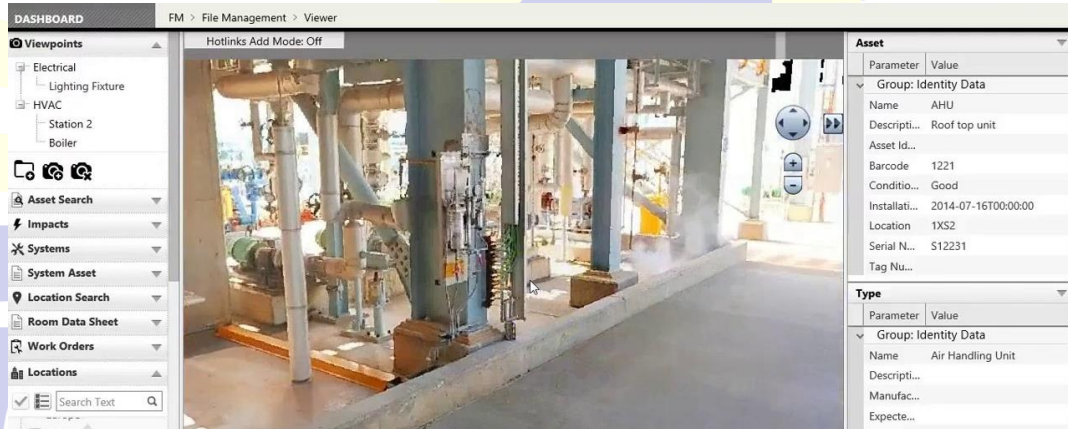


Figure 1 Asset management and tracking

Safety inspections and maintenance: BIM can facilitate safety inspections and maintenance activities by providing a virtual walkthrough of the building and its systems. This allows facility managers to identify potential safety hazards or maintenance requirements in a timely manner. For example, a BIM model can help identify fire escape routes, fire extinguisher locations, or emergency exit signs, ensuring compliance with safety regulations.



Figure 2 Walk through in BIM model

Real-time monitoring and diagnostics: BIM can be integrated with sensors and IoT devices to provide real-time monitoring and diagnostics of the building's systems. This allows facility managers to identify and address potential maintenance issues promptly. For instance, sensors can detect abnormal temperature fluctuations in HVAC systems, enabling early detection of malfunctioning units and the scheduling of necessary repairs.



Overall, BIM provides a collaborative and information-rich platform for effective maintenance of buildings. By facilitating proactive planning, asset management, energy optimization, safety inspections, and real-time monitoring, BIM ensures the efficient operation and maintenance of buildings throughout their lifespan.

BIM model for Facility Managers

BIM models can be highly beneficial for facility managers in operations by providing a wealth of information and enabling efficient management of the building. Here are some ways in which BIM models can assist facility managers:



Figure 3 BIM in Facility Management

Visualization: BIM models offer a visual representation of the building's components, systems, and spaces. Facility managers can navigate through the model to gain a comprehensive understanding of the building's layout, structural elements, and equipment locations. This visualization helps in planning maintenance activities and understanding how each system and component interacts with others.

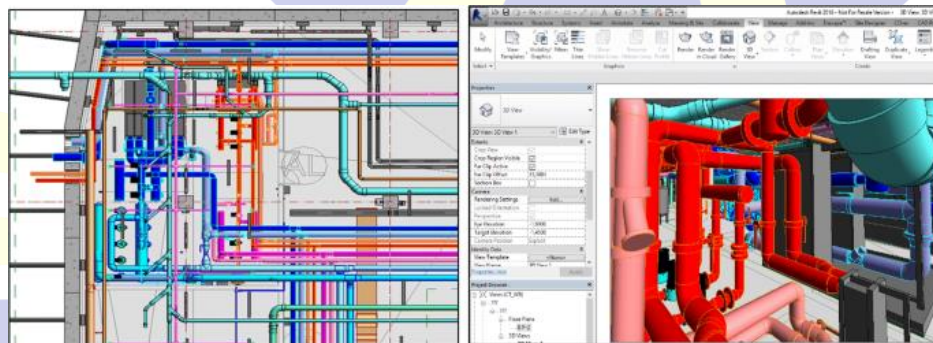


Figure 4 BIM Visualization

Asset management: BIM models can serve as a centralized database for all assets within the building. Each asset, such as HVAC systems, electrical panels, or fire suppression systems, can be linked to the BIM model, providing detailed information such as specifications, maintenance history, and warranty details. Facility managers can easily access this information and plan maintenance tasks accordingly.

Maintenance planning: BIM models support facility managers in planning and scheduling maintenance activities more effectively. By analysing the spatial and functional relationships within the model, managers can determine the most efficient routes and access points for maintenance tasks. BIM models also provide valuable information on the condition and lifespan of assets, making it easier to prioritize maintenance tasks and allocate resources accordingly.

Clash detection: BIM models can be utilized to identify clashes or conflicts between different building systems, such as pipes conflicting with structural elements or electrical wiring obstructing

ventilation systems. Facility managers can identify these clashes in the virtual environment and resolve them before they become costly issues during construction or maintenance.

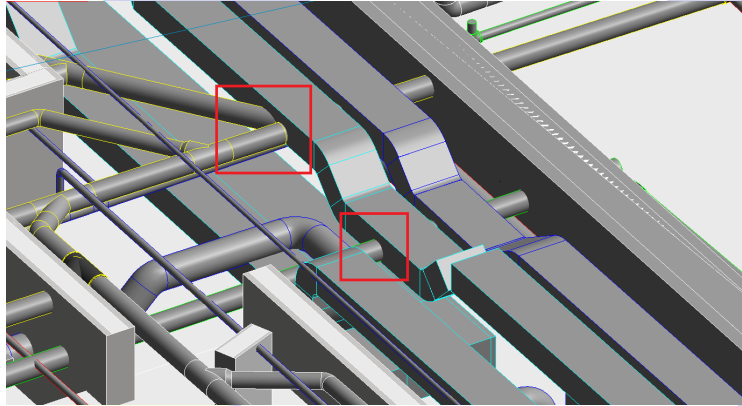


Figure 5 Clash detection

Communication and collaboration: BIM models provide a collaborative platform for facility managers to communicate with various stakeholders, including architects, engineers, contractors, and maintenance staff. The model can be shared and accessed by all parties involved, facilitating more effective collaboration, coordination, and decision-making throughout the building's lifecycle.

In summary, BIM models offer facility managers a comprehensive toolset to effectively manage and maintain buildings. From visualization and asset management to maintenance planning and energy optimization, BIM models enhance the efficiency, accuracy, and collaboration in facility operations.

BIM Model in energy optimization during the operation and maintenance of a building

BIM models can play a crucial role in energy optimization during the operation and maintenance of a building. Here are some ways in which BIM models can support energy optimization:

Energy analysis: BIM models can integrate energy analysis tools to assess and analyse the building's energy performance. These tools simulate and evaluate the energy consumption of the building, considering factors such as HVAC systems, lighting, insulation, and renewable energy sources. Facility managers can use the energy analysis results to identify energy-intensive areas and systems within the building and explore potential energy-saving measures.

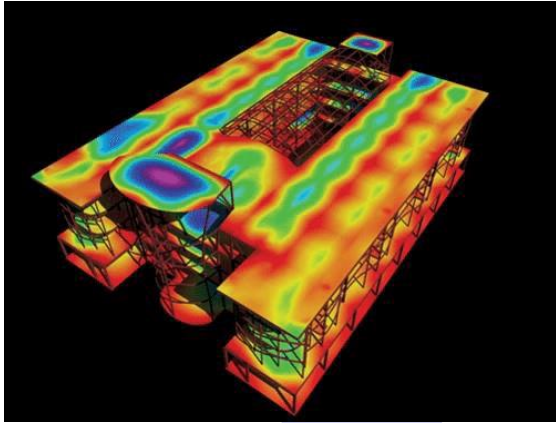


Figure 6 Energy analysis of BIM model

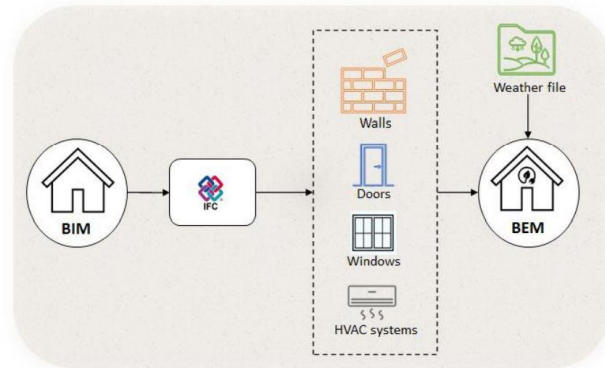


Figure 7 Building Energy Monitoring process using BIM

Monitoring and data collection: BIM models can be linked to building management systems or energy monitoring systems to collect real-time energy consumption data. This data can be analysed within the BIM model to identify trends, patterns, and irregularities in energy usage. Facility managers can use this information to detect energy wastage or unexpected energy spikes and take corrective actions.

Operational adjustments: BIM models can be utilized to test and simulate operational adjustments to optimize energy usage. For example, facility managers can simulate changes in HVAC set points, occupancy schedules, or lighting controls to determine their impact on energy consumption. By experimenting with different scenarios within the BIM model, managers can develop effective strategies to reduce energy waste and optimize the building's energy performance.

Retrofitting and upgrades: BIM models enable facility managers to evaluate the impact of retrofitting or upgrading equipment or systems on energy consumption. Managers can simulate different retrofit options within the BIM model to assess their energy-saving potential and cost-effectiveness. This helps in making informed decisions on which upgrades or retrofits would yield the best energy optimization results.

Collaboration and communication: BIM models facilitate collaboration and communication between facility managers, energy consultants, and other stakeholders involved in energy optimization efforts. The BIM model can be shared and accessed by all parties, allowing for seamless sharing of information, coordination of efforts, and analysis of energy optimization strategies.

By utilizing BIM models, facility managers can have a deeper understanding of the building's energy performance and make data-driven decisions to optimize energy usage during the operation and maintenance phase. This not only reduces operational costs but also enhances the sustainability and environmental performance of the building.