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BUILDING INFORMATION MODELING SOFTWARE AS A SUPPORT TOOL OF FACILITY MANAGEMENT

Інформаційне моделювання у будівництві (BIM) для менеджерів – це більш ніж просто раціональний спосіб досягнення цілі, а новий інструмент покращення характеристик будівель і ефективніше управління операціями протягом його життєвого циклу. Що таке програмне забезпечення BIM? У той час, коли визначення змінюються, BIM може розглядатися як одна величезна база інформаційних даних. Програмне забезпечення BIM включає 3D-інформацію. В додаток до інформації з архітектурім. Повна версія BIM включає усю інформацію з будівельних конструкцій і структурних систем, обладнання для обігрівання, вентиляції і кондиціювання повітря (HVAC), санітарно-технічного обладнання будівель, дверних і віконних панелей тощо. Істотним моментом є те, що це стосується конкретного виробника і постачальника систем і компонентів, що є значною перевагою для сприятливого менеджменту. Показано сприятливі можливості, які відкриваються у сфері менеджменту під час використання BIM-технологій.

Ключові слова: інформаційне моделювання у будівництві, сприятливий менеджмент, життєвий цикл, 3D-модель.

For facility managers, Building Information Modeling (BIM) is more than a shortcut. It is a new tool for enhancing the performance of building and more efficient management of operations throughout its life cycle. What is BIM software? While definitions vary, BIM can be seen as a one large database of informations. BIM software is designed to share the information of the building. BIM software includes 3D model of building. In addition to information architecture, complete BIM contains all information about building construction and structural system, Heating, Ventilating, and Air conditioning (HVAC) equipment, plumbing fixtures, door and window panes, and many others. Essential is that should refer to a particular manufacturer and supplier of systems and components, which can be a significant benefit to the area of facility management. Aim of this article is to highlight the opportunities that offer us in the field of facility management with using BIM technology.

Key words: building information modeling, facility management, life cycle, 3D-model.

Introduction. The design and construction industry, essentially unchanged for well over a century, is looking at a future significantly different than its world today. A range of forces are at work, new tools, methodologies and roles are influencing and shaping fundamental cultural and Business shifts [1]. Construction gradually passes before them like other industries to automate. It is a sector where much of the work still done by hand, and not on the computer. Although all participants in construction use computers, the information should be disseminated through a web server environment is often transmitted to third parties and sharing in paper form and not by sharing a virtual database. The last time a change comes, which is known as BIM. It's software that acts as a database with information on the building. Unlike other devices, facility management, such as computer aided design (CAD) or central maintenance management system (CMMS), BIM software is designed to integrate all aspects of the building. Although the idea of BIM technology is not entirely new software that was developed for the virtual modeling of buildings, so far little used and its potential remains untapped.

Data rich modeling tools may translate into dynamic new facility management capabilities [2]. Virtual object model provides several ways to save costs in design and has, for example, by analyzing

where it is possible the results of direct and alter the structure of the building. For the area of facility management is an interesting commonality and connection technology of BIM technology in facility management using the so-called computer aided facility management (CAFM) systems. This new link would allow the use of BIM model building throughout its life cycle which may constitute more than 60 years.

Support of facility management through BIM technology. The basic requirement of all parties to the construction process itself is a model building with the option to input and extract data. BIM technology uses spatial units - blocks, cylinders, tubes, cones and other shapes with little or no architectural detail, as with all models of construction information. This information comes from various sources and from different building part professionals to avoid delays and unnecessary costs and subsequent conflicts before construction phase. Thanks to the BIM model, we address the conflict situations in the form of prevention. This is particularly important when technical security building, because the assembly lines and equipment may be a large number of conflict situations. Model is possible tie with the work schedule and budget, so it can be divided into sequences and to help all parts involvement. Inspectors from safety throught cost assessors, to the individual suppliers which ultimately have a positive impact on the overall construction period of the building. BIM model involvement helps all parties understand the project in all respects and to prepare for all possible circumstances, reducing the risk of cost overruns.

Graphic design BIM model is a result of the build information into the model. Until now the use of 2D diagrams, BIM technology works in two and three-dimensional environment. These models is possible to discuss in detail, it is also possible to just "walk" the object. We can talk about a built-intelligence in model. The higher the quality and detail, it is more telling of his three-dimensional display and all outputs tied to it. Each structural element, which is located in the models should carry with them information.

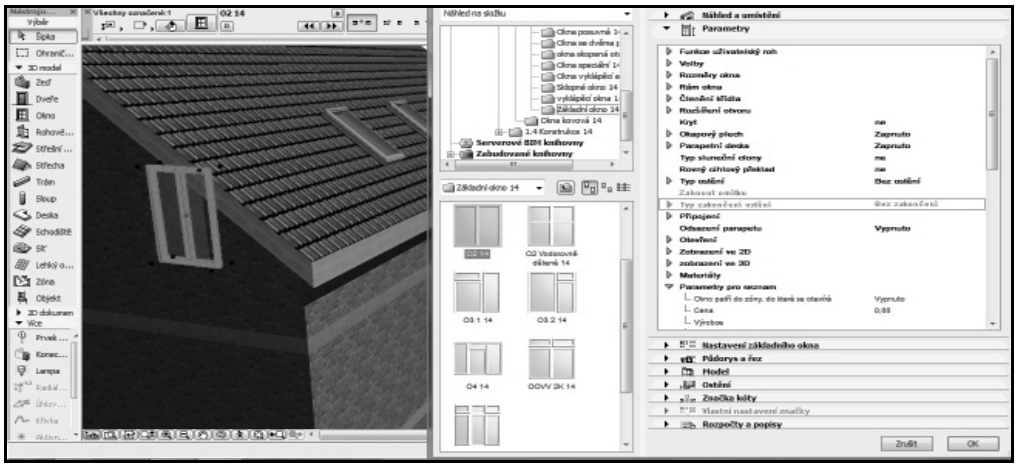

Figure 1. Defining the parameters for individual elements of BIM model

If the model is detailed, and every element of design may entail information such as: make, model, serial number, warranty information, price, weight, inventory number, a specific record, etc ... In other words, there is a place where you can fully exploit the potential of BIM technology.

For everyday work facility management software that integrates all knowledge of the building can bring significantly increased efficiency of operation and economic benefits in the form of saving operating costs. At least in an ideal world would be so "could" and should work. A key aspect is that the BIM model must still "live" even after the transfer of owner or facility manager, who will take care of the facility and operate it [4].

If the BIM model will not forget to updating, so in that case the potential along a virtual model of the building bore stay untapped. If we want to successfully use the BIM system, so another key element is the human factor. Although there is the possibility of automatic updates, you can not automate everything,

each facility manager must be able to intervene and make changes to the models by hand. The potential for the use of BIM technology is huge. In theory, this could facilitate such an approval process by making it possible to automatically review the proposal and compare it with the software.

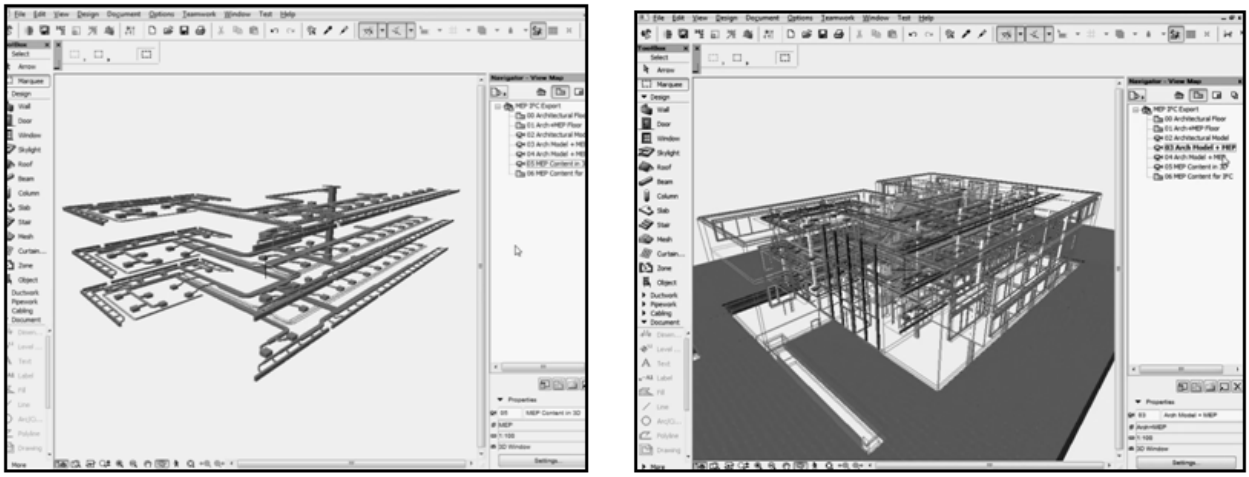

Figure 2. Great benefit of MEP (Mechanical/Electrical/Plumbing) modeler

http://www.graphisoft.com/ftp/marketing/mep/11/11.html

This would mean that the BIM model is subjected to the approval process, let's call it "automated preventive check", which could accelerate the process. Software can and should be configured so that architects, designers and others avoid mistakes already in draft.

National Institute of Building Sciences (NBIMS) in the United States is working to standardize data and the use of BIM technology. International Alliance for Interoperability (IAI) helps simplify and interconnect systems and software in the BIM technology. IAI works with Vladimir Bazjanac, researcher at Lawrence Berkeley National Laboratory, which seeks the seamless integration of data and link data from external sources of facility management [4]. Improving these formats is still ongoing.

“Intention,” says Fuhrman (CEO of chieff executive of the Open Standards Consortium for Real Estate-OSCRE), “aims to develop skills and opportunities to share data, so that the model with associated data could be handed to the owner, operator or investor and can be easily integrated with existing systems in the departments of management, finance, security and automation systems [4]. ”

Integration BIM models into CAFM systems. Computer Aided Facilities Management evolved in the late 1980's leveraging the PC to automate the collection and maintenance of facilities management information. CAFM systems combine and analyze complex data to improve facility management. The CAFM system gives decision makers the ability to automate many of the data-intensive facility management functions and typically results in continuous cost savings and improved utilization of assets through-out their entire lifecycle. Although there is no ideal model suitable for all situations, to meet the specific demands of the facility manager, a well developed CAFM system will often include a variety of functions and features. CAFM systems typically provide and maintain information on floor plans, property descriptions, space utilization, energy consumption, equipment locations, and other critical infrastructure data that pertains to the sector it is serving [6]. BIM models for integration into CAFM systems and structures are working hard, although this is not the only form of primary results. Capacity and reliability of these systems are checked and are looking for the best way of implementation and results throughout the economic structure of buildings with BIM models. It also created many new modules, which would facilitate the work of the facility manager and has been bridged with the ERP (Economic Resource Planning), CMMS and other formats to be used in practice.

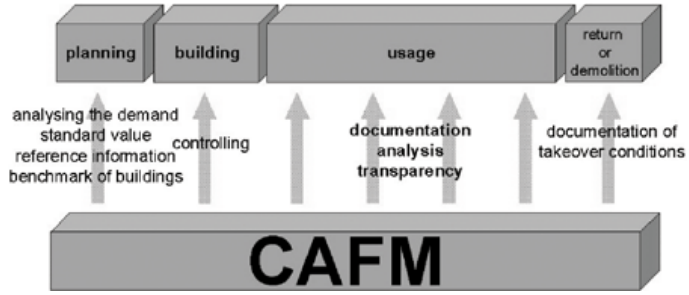

Figure 3. Usage of CAFM in the life cycle of a building [7]

Conclusion. Expect manufacturer cooperation. The key to attaining a higher level of operations and maintenance for a building via data rich 3D building modeling is elite computerized graphics backed by sophisticated data and monitoring capabilities. In the new age of FM, all manufacturers of any equipment or furnishings going into a building will provide that content as a regular part of bidding. FMS can be advocates for the manufacturers' buy-in. The new level of collaboration between professionals is powered by sophisticated, interactive 3D modeling, especially as offered by BIM (building information modeling) tools to the building industry. By linking a building's 3D model with databases and Web based monitoring capabilities, facility management system like those at the University of Southern California are reaping major benefits to their life cycle operations and maintenance (3)

A BIM based FM solution has been available in Europe for about ten years [5].

In practice, this means a complete change not only the established practice and standards, but also a change of mind. From this perspective will be more important to deal with it is not a technical, but the value page. Companies that deal with facility management recognize the importance of progress. It is only a question of standardization and consolidation of the entire system to be able to quantify the benefits of CAFM system using BIM model.

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