OPEN BIM Healthcare Design by LINK arkitektur

LEARN HOW

• *BIM helps clients to understand and follow the design process;*

• *an information database connected to BIM elements makes the requirement and specification workflows easier;*

• *OPEN BIM can save time and money for the client through coordinated design.*

LINK ARKITEKTUR

Södersjukhuset in Stockholm by LINK Arkitektur

Project Name: **Södersjukhuset**
Location: **Stockholm, Sweden**
Type: **Healthcare**
Cost: **3,4 billion SEK**
Projet start: **2013**
Estimated finish. : **2019**
Software used: **ARCHICAD, BIMeye, Solibri, Velux Daylight Visualizer, Revit, BIMcollab, Bentley, MagiCAD, Vico Office**

BIMeye is used in several hospital projects ; Södersjukhuset in Stockholm by LINK Arkitektur

Hospitals are one of the most complex buildings in terms of use, special needs and inside equipment. Many aspects of BIM were already among the client's requirements to ensure the design satisfies the needs of the building users when LINK arkitektur was selected to take on the rebuilding and expansion of Stockholm Southern Hospital (SÖS, Södersjukhuset in Swedish). With their meticulous and patient-focused architecture, the building design received Miljöbyggnad Silver certification.

LINK arkitektur is one of the leading architecture firms in Scandinavia, ranking #43 on the World Architecture 100 list in 2017. They have experience with many different types of buildings, including healthcare, commercial and residential design. They also gained a lot of experience in OPEN BIM using ARCHICAD as their main BIM authoring platform, but, of course, every new project brings new challenges, especially if size is combined with a high level of complexity.

Södersjukhuset in Stockholm by LINK Arkitektur

SÖS is one of the largest emergency hospitals in Scandinavia. The client, Locum AB, owned by Stockholm County Council (SLL), is one of Sweden's major property managers with a property portfolio of approximately two million square meters in Stockholm County. The project included renovation and extension of existing buildings, demolition of some older buildings and addition of new buildings to the site. In total, the project expanded to 70 000 m2 in 13 buildings with 3000 rooms.

The involvement of a BIM solution in such a project helps clients and the building users to understand what the building will be like, making it easier for them to participate in and contribute to the design process as healthcare providers. The clients' and users' contributions benefit the architect, and BIM ensures easier communication on the specification of the building, rooms, arrangements with great visual aid.

The client wanted to make sure that the refurbished hospital provides a good working environment with flexibility and patient safety. Therefore, their goal was to certify the building according to the Miljöbyggnad certificate of Sweden Green Building Council. This certificate focuses on sixteen different indicators regarding energy consumption, air and noise quality and environmental impact. They knew that to achieve this they must closely follow and understand

the design process, and the best way to do so is provided by BIM. They came to the architect with several BIM-related requirements to support the design and certification process. These were various simulations – sun, daylight, accessibility, energy – for testing the performance of the design, model-based coordination with consultants, clash control, cost and time estimates, and IFC model handover at the end for facility management.

The BIM model was a great visual help when the architects communicated the design with healthcare specialists. Doctors and nurses might not be familiar with reading 2D abstract plans. 3D images focusing on one specific room, e.g. the operating room, were regularly used during the coordination to help them understand the arrangement and different equipment of the various rooms. Here, BIMx's simple and easy to use interface proved to be useful, too; the hospital staff appreciated the access to the design of their future workplace. During these meetings, architects and consultants collected the exact requirements of the rooms and all the special equipment inside. Managing all this data and information in the BIM environment required a structured database solution connected to the BIM authoring tool.

Information movement
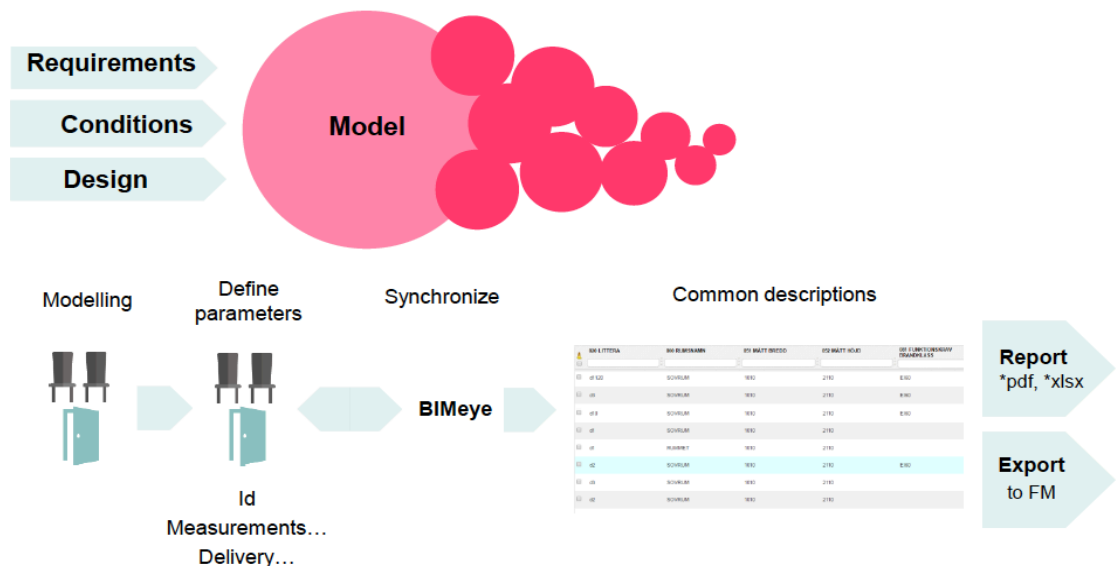
> ***"An add-on to ARCHICAD provides an opportunity to pair the ARCHICAD model with BIMeye, allowing information to be synchronized in both directions."***
>
> Developer: Pål Janson, BIMeye

BIM offers an opportunity to collect information about the building elements, equipment and furniture into a database and connect this to the building model. With this workflow, architects can have a better understanding of the unique healthcare requirements of each room, then discuss the specifications with the healthcare workers and consultants.

LINK selected BIMeye's web apps for data management. In fact, the collaboration between LINK and BIMeye led to the add-on development for ARCHICAD that is now available for others as well.

BIMeye provides a database solution for information management from early phase programming through asset specification for procurement to facility management. In this project, the solution was used for room data sheets, doors, interiors and asset management. Early on, LINK identified that the workflow provided by BIMeye and ARCHICAD leads to an efficient information management process in the project.

The BIM model that contains information derived from requirements, conditions and design are broken down into defined IFC parameters that are shared as synchronized information to BIMeye. BIMeye also made it possible for the consultants who
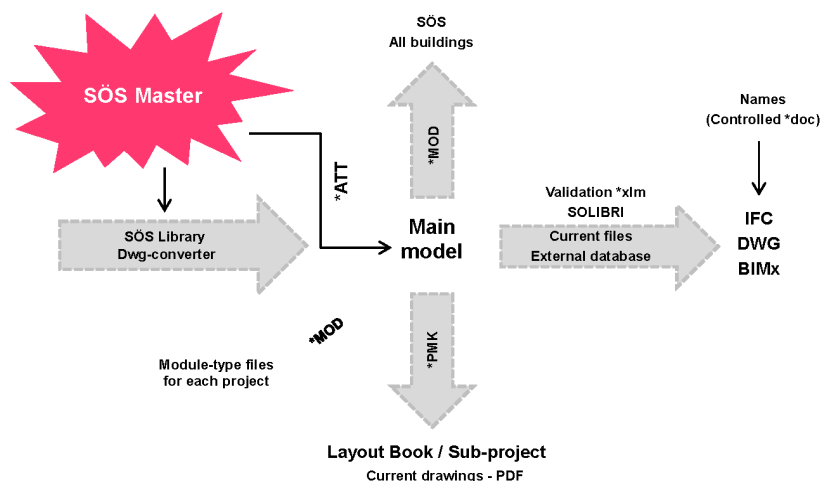
BIMeye add-on in ARCHICAD
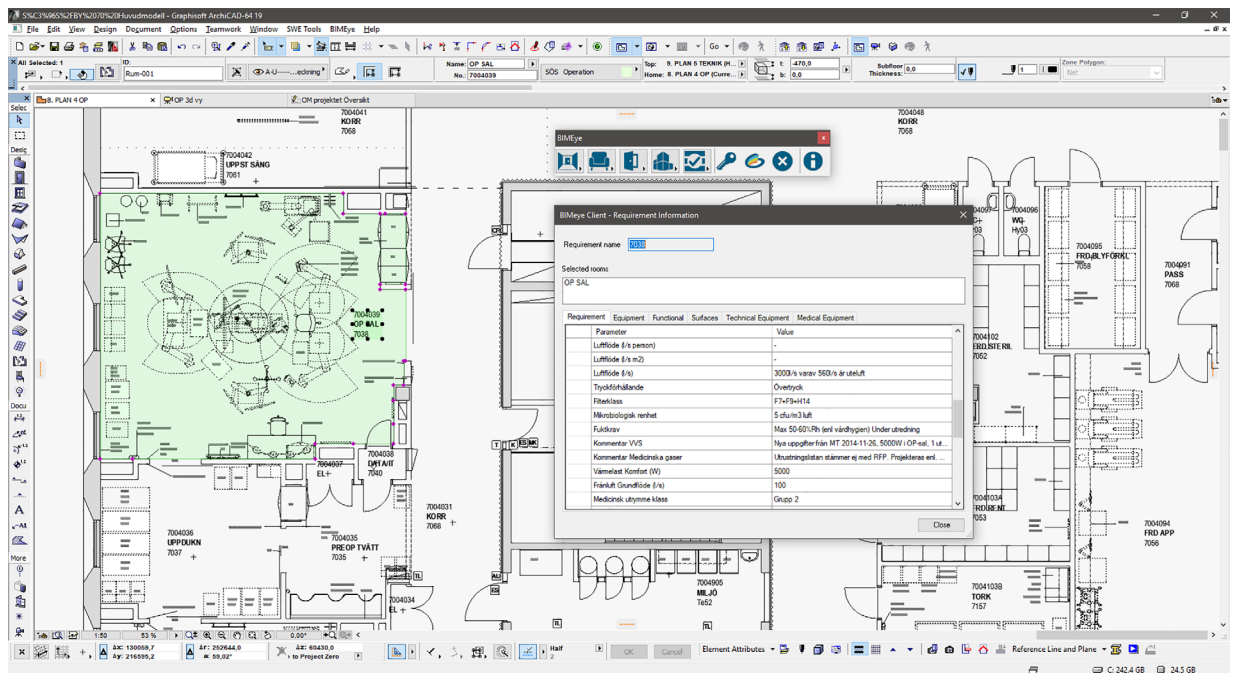
do not use ARCHICAD to set the requirements for the different elements such as doors and interiors right through the web-based interface; these are synchronized to ARCHICAD in which architects define the element and sync the specification back to the BIMeye database. Even preview images of elements could be synchronized. Reports could then be generated from the developed data now built in BIMeye. This project proved that ARCHICAD and BIMeye are compatible and very useful for large-scale project management.

BIM offers solid management over design changes, and smoother coordination with other disciplines for the architect, thus providing faster and streamlined workflow to the project. Collision detection or early discovery of discrepancies saves time and money, benefiting both the client and the architect. Above all, it's a much more enjoyable and easier way of designing buildings with 3D compared to 2D CAD-programs, especially with such complicated design and setup.

The existing building structure and the complex design task – renovation, demolition, new buildings – suggest that this is not an easy job for the architect in any software. LINK used ARCHICAD Teamwork to take on the challenge. The BIM team created a plan and clever project organization: each building had its own Teamwork projects: a main model and a separate layout book. Wherever the buildings are connected to each other, the 3D models and generated 2D plans were cross-referenced using the Hotlink

Processes

SÖS Master

SÖS Library
Dwg-converter

*ATT

Main
model

*MOD

SÖS
All buildings

*MOD

Validation *xlm
SOLIBRI
Current files
External database

Names
(Controlled *doc)

IFC
DWG
BIMx

Module-type files
for each project

*PMK

Layout Book / Sub-project
Current drawings - PDF

and drawing features of ARCHICAD. The models were also linked into the masterplan to show the larger context of the design. Their internal process scheme also defined which Teamwork projects produced IFC and reference drawing files and the documentation output in DWG and PDF. To control such a complex project environment, they introduced strict naming conventions also documented in the BIM manuals.

In such a complex project with several architects, consultants and engineers, quality control of the models and drawings is of the utmost importance. LINK has an internal process for this purpose: each building had an appointed Model Manager, who were responsible for the accuracy of the model. Their task was to audit the model inside ARCHICAD, export to the various formats, and do further checking in Solibri. They also had elevated permissions in the projects; for example, they managed the attributes and layers.

An external consultant company was contracted to merge all the engineering and architectural models and check them in Solibri and Navisworks. They sent out issue reports in PDF and organized BIM coordination meetings monthly. The coordination of the different models caught a lot of problems before the actual construction, saving money for the client as a result.

After successfully completing the design of the Södersjukhuset hospital, LINK is already working on the next hospital project in Helsingborg.

LINK arkitektur

linkarkitektur.com

LINK arkitektur is one of the leading architect firms in Scandinavia, in terms of turnover, the number of employees and the number of projects completed annually. As a business model and philosophy, LINK has chosen to allow their 15 offices with approximately 450 employees in Norway, Sweden and Denmark to create their own culture and specialist fields.

Image credits: Linn Areno / Archivisuals / Brick Visual

BIMeye

www.bimeye.com

Project Services (PS) is the Business Unit in charge of delivering our cloud based BIM Data Management service BIMeye to the market. PS is a part of Addnode Design Management; one of the largest suppliers of business-critical support systems to engineering and construction operations in Northern Europe (Sweden, Norway, Denmark, Finland and the United Kingdom). With good knowledge about the customers' processes, Design Management delivers IT solutions that reduce costs, shorten lead time and develop the most important processes.

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