

Using BIM to set up work sites

BIM Projects at VINCI Energies. Where are we exactly? What advantages and challenges are yet to come? Pierre Blanchet, Head of Innovation (Building Solutions), answered our questions.

When did BIM appear?

BIM (Building Information Modelling or building data modelling) first appeared over ten years ago, thanks to the development of 3D.

We used **2D drawings**, mostly done by hand, for years. **CAD (Computer Assisted Drawing)** software came in at the end of the 1980s, making design and modification **much faster** compared to when using the drawing board. This method became more widespread until the end of the 1990s. The emergence of the digital model signalled the arrival of a new era. Today, the market is expanding rapidly.

If you're feeling nostalgic, don't worry — 2D drawings still have a long future ahead of them, as they are essential on the work site when setting up.

In addition, not all construction projects are suited to BIM. Its use is justified according to the complexity and size of the building, and particularly for new projects. I strongly recommend it for projects of over 10,000m².

What has changed with BIM?

Our **working method** has changed — we were used to drawing. With BIM, our **way of designing has become more “object” oriented**. That is to say, we now work with a **library of 3D objects** and **each object has its own characteristics** in terms of materials, dimensions, covering etc. The aim is to design a **complete digital model** that will be used to **install equipment on site**. This model is created by the architect then modified, adapted, completed and enhanced by the engineering consultants and companies until the As-Built Drawings phase.

Can you quickly sum up the market for BIM Projects?

All our companies know what BIM is. Whether they use it or not depends on their market positioning. BIM is less developed outside of the Paris region, where it is **used for 80% of large projects costing €2-3 million**. Overall, however, **the market is buoyant**. BIM will probably become more widespread in the future.

What are the main advantages?

The advantages of BIM can be summed up in four key points:

- **Visualisation:** BIM offers a mobile perspective that helps not only customers, but also designers and builders, to get to grips with an infrastructure.

Take, for example, a **customer in the hospital sector**. Doctors often want to visualise the finished building, but they are not used to reading architectural drawings. That is why we hold “**immersion**” meetings. During these meetings, they can visualise the premises in 3D on a big screen.

- **Anticipation: Detecting errors before work has even begun** thanks to the **overview**, which aims to **coordinate the different networks**. This means **combining all of the equipment** for an extremely clear visualisation and to avoid any errors at the construction phase.
- **Speed:** At the design phase, BIM speeds up **understanding** installations on site and allows us to **foresee certain technical constraints**. This makes the work site run more **smoothly** and means the building can be delivered more quickly.
- **Communication:** BIM is also a tool for **communicating** and **sharing**. Everyone involved in the construction project works on the same digital model, which facilitates **the summary and communications work between the different participants**.

Is there anything holding back BIM adoption?

The main things holding back BIM are training and cost.

Using BIM requires training to use a new tool. Candidate profiles with **good knowledge of buildings and an understanding of IT tools** are therefore fairly rare. Indeed, as **work packages are standardised**, BIM Managers should have **good knowledge of all trades and file templates**.

The **cost** will be a bit higher, especially in the intermediary phases where 2D still persists. But in air conditioning in the Paris region, there is no longer an additional cost for 2D or 3D. **I am convinced that the additional costs of studies will gradually vanish, but the quality gains will remain.** BIM is more precise than 2D, which means that we have **fewer modifications to make** — that is to say, fewer set-backs on site that reduce efficiency.

What are the challenges to face?

Firstly, and going back to the last question, I would say the need to **encourage training** because BIM is set to spread, and we are sorely lacking in qualified personnel.

Secondly, **standardising modelling** is still a major challenge, not only regarding the relationship between packages with the BIM work site charter but also the methodology for 3D object digitalisation.

What are the developments that are yet to come?

BIM is first and foremost used for the spatial organisation of equipment. But that's not all. We also carry out thermodynamic simulations, power budgets, lighting notes and regulatory calculations. Over time, connections will be built between the 3D model and other design tools.

To link with VINCI Facilities, is BIM Operation only possible if BIM Projects was used for construction?

No, but it's not black or white. Let's look at two different cases.

If a customer orders a model when they order a structure, they may think it will be useful for the project and its future operations. They will then specify that clearly in the project specifications. Companies are therefore perfectly aware of the customer's wishes and will keep them in mind from design.

The As-Built Drawings model describes what is built. It is the final document, which will enable us to create the digital model that can be used for operations. The less important information will be cleared away for the operator.

If the customer has not specifically asked for this in advance, it is not considered a contractual element. Companies will then just provide the As-Built Drawings model. However, the customer can still digitalise the building once it has been completed. This is what VINCI Facilities does for existing buildings. It does not require the same **level of accuracy** as at the design and construction phases.

We support the continuity of the model — that is to say, the utility of thinking about the operation phase from the construction phase. The problem with property is that we know what we are building, but not who will operate it. Customers do not always envisage operations and prefer to make decisions later.

Is the point of BIM Projects the operations we can use it for?

Economically, **more and more customers are interested in the BIM solution** — for operation as well as construction. They will have a complete digital object that contains all of the information grouped together in the same place to facilitate the operation of their building.

However, this is not widespread. There are lots of projects of a certain complexity and size whose owners decide to just use BIM at the construction phase. This is particularly the case for new projects in the Paris region.