Why use BIM in renovations?

The contributions of BIM-SPEED to improve the quality of renovated residences in Europe

In our first #BIMterview, BIM-SPEED project coordinator Prof. Dr. Timo Hartmann talks about his motivations in conceiving this project, the innovative solutions that BIM-SPEED will provide to simulate different renovation scenarios, and how demonstration cases can help speed up the adoption of BIM in renovations.

What was your main motivation to get involved in proposing the BIM-SPEED project?

I personally only want to get involved in projects with high relevance to the society and we need to improve the energy efficiency of our buildings. BIM-SPEED brings together the experts in BIM for renovation activities across Europe together. All our partners have previous experience in energy-efficient renovations and in the use of BIM for renovation activities. We believe that with our background and knowledge in BIM, we can, through this project, make a large contribution to the society.

We understand that while BIM is being adopted in new buildings, there are still bottlenecks to be solved to increase the BIM adoption in renovations. How BIM-SPEED can contribute to overcome this challenge?

Our consortium partners have previous experience in using BIM for renovations as well as in new buildings. So the question is: Is it just more complex to renovate than to make a new building? If so, then it's more complex to use digital technologies to support this more complex process. However, when BIM is implemented successfully in renovations than the potential benefits are also higher.

BIM-SPEED will contribute by providing, first of all, very innovative methods. Particularly on how we can model existent building, but also in respect of how we can simulate different options from different angles. I like calling that **Multiphysics simulations**: Not only being able to simulate the energy efficiency of the building but also different comfort, variances, costs, and so for. That's really the promise that central and good structured information from the existent building and new design variances can offer.

Secondly, once these innovations can also be demonstrated through our demonstration projects, we can really provide lighthouse demonstration for Europe.

How can the use of BIM help reduce the energy consumption in renovated residences? What are the expected impacts of the project in this sense?

The biggest problem we have currently is that we have little possibilities to fully understand what the energy reduction of certain renovation alternatives will be. We call that **prediction performance gap**. We cannot upfront really estimate the energy savings that certain renovation activities will provide. That makes it difficult for making the decision of when to renovate, what to renovate and what renovation options to choose to gain the most advantages.

One of the things the BIM-SPEED will provide is to allow us better decision making by predicting the possible energy reduction upfront in the design phase around the virtual model. We design virtually first, before we build, and through this prediction upfront, we can find the best option, that will give the best energy consumption.

Another very important thing to consider is that finding the best energy consumption is easy, but we need to find viable energy consumption maintaining or improving your comfort. Never forget, the most energy-efficient building will be off the grid and have no electricity and no heating. But that is not very comfortable (laugh).

In the traditional construction industry, while deciding whether or not to adopt innovative solutions to their projects, practitioners tend to look for evidence of the benefits of these solutions. How do you think the BIM-SPEED demonstration cases could contribute to that?

It is good that the construction industry is pragmatic, we need to be pragmatic. We cannot spend a lot of money on trying things out. A building needs to work properly when it is completed. More than the value, people seek to understand the feasibility to implement something new in a project.

We want to use the demonstration cases to demystify BIM. I think people understand that if we have good ways to simulate something, good ways to predict upfront the energy efficiency and conform of a building, then we can increase the quality of the renovation. I don't think we need to argue about that. We have to argue that it is really feasible to implement that, with the current skills and knowledge of the companies, without needing a bunch of experts in the back office that do this.

I think this is what we have to show in the demonstration cases. Basically, through the project we have the chance to significantly innovate, providing new solutions. But also to directly illustrate how the solutions work in the demonstration projects. And we believe the demonstration is highly relevant to influence the adoption of BIM for renovations. Because if practitioners see that the solutions are working well, then they are more inclined to use it.

That is the focus of the demonstration cases. If we can communicate that it's actually not so hard to use BIM for energy-efficient renovations, then I think we can have a really big impact.

Prof. Dr. Timo Hartmann from Technische Universität Berlin is the BIM SPEED project coordinator.

Timo's research and teaching focus on integrated design for high-performance buildings and facilities with a focus on BIM-based simulation and advanced data analytics. His work has been published in renowned academic journals. He has significant experience in participating in Horizon 2020 projects, and has contributed to P2Endure, GoSAFE, DestinationRAIL, SAFE10T.