

AUDIT

Digitalisation in construction: Construction audit of new research campus

Swiss Federal Laboratories for Materials Science and Technology

KEY FACTS

Building information modelling (BIM) is a digital method for planning, executing and managing construction projects. It is based on the creation and use of an intelligent 3D model that contains geometric, temporal, financial and functional data of a building or infrastructure. This results in advantages in the project planning and realisation phases, as well as in the operation of buildings. BIM is seen as an opportunity to complete construction projects more reliably and increase productivity within the industry.

The Swiss Federal Audit Office (SFAO) audited the first use of BIM at the Swiss Federal Laboratories for Materials Science and Technology (Empa) on the basis of the previously completed *co-operate research campus* construction project. The aim was to assess whether the use of BIM was worthwhile. As no specific cost and benefit targets were defined for the introduction of BIM and there are no key figures as a starting point for assessing the impact, it is not possible to make a reliable assessment of how well the potential is being exploited.

The introduction of BIM is a learning curve, the benefits are difficult to quantify

Empa embarked on a new direction in 2016 with the introduction of BIM. The SFAO welcomes Empa's decision to exploit the possibilities of digitalisation in the construction industry. It is understandable that the learning curve is high and that the potential cannot yet be fully utilised.

Empa assumed that the use of BIM would result in advantages in the various phases, from construction to operation. However, clear cost and benefit targets were not defined, partly due to a lack of empirical values. The actual benefits and impact of the introduction of BIM are therefore not quantifiable. Issues such as interface problems with subsystems and additional expenses for building documentation only arose as the project progressed, leading to additional costs.

Nevertheless, the use of BIM has potential. Empa has gained a great deal of experience in recent years. The task now is to collate and process this, and derive any necessary measures from it. This will serve as a basis for examining how BIM can be used effectively in further projects, utilising the benefits and avoiding recurring errors.

In addition, the SFAO recommends that Empa share its experiences with the federal construction and property bodies and thus provide a broad benefit for the entire ETH Domain and the Federal Administration that goes beyond the confines of its own institution.

A targeted use of BIM in operations still needs to be developed

As it has not yet been possible to transfer the BIM data from the construction project to operations and the specific utilisation options have not yet been conclusively clarified, the question of the extent to which BIM can be used effectively in the operational phase cannot be answered conclusively. However, the intended use for operations seems appropriate and plausible. Whether and how this can be realised remains to be seen.

The possible uses of BIM data in operations must therefore be worked out in a timely manner. Combined with the resulting costs, this forms the basis for targeted implementation and operational use.