

## A BIM-Based Approach to Assess COVID-19 Risk Management Regarding Indoor Air Ventilation and Pedestrian Dynamics

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**Abstract :** In the context of the international spread of COVID-19, the Centre Scientifique et Technique du B&acirc;timent (CSTB) has led a joint research with the French government authorities Hauts-de-Seine department, to analyse the risk in school spaces according to their configuration, ventilation system and spatial segmentation strategy. This paper describes the main results of this joint research. A multidisciplinary team involving experts in indoor air quality/ventilation, pedestrian movements and IT domains was established to develop a COVID risk analysis tool based on Building Information Model. The work started with specific analysis on two pilot schools in order to provide for the local administration specifications to minimize the spread of the virus. Different recommendations were published to optimize/validate the use of ventilation systems and the strategy of student occupancy and student flow segmentation within the building. This COVID expertise has been digitized in order to manage a quick risk analysis on the entire building that could be used by the public administration through an easy user interface implemented in a free BIM Management software. One of the most interesting results is to enable a dynamic comparison of different ventilation system scenarios and space occupation strategy inside the BIM model. This concurrent engineering approach provides users with the optimal solution according to both ventilation and pedestrian flow expertise.

**Keywords :** BIM, knowledge management, system expert, risk management, indoor ventilation, pedestrian movement, integrated design

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