



## Demystifying cyber-physical risks in smart building

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*Published in:*

Proceedings of the 5th SRA Nordic Conference on Risk Management for Innovation

*Publication date:*

2019

*Document Version*

Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Kalluri Mallikarjuna, B., & Kozin, I. (2019). Demystifying cyber-physical risks in smart building. In *Proceedings of the 5th SRA Nordic Conference on Risk Management for Innovation* (pp. 29-29)

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## **Demystifying Cyber-Physical Risks in Smart Building**

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Today buildings in urban environment are being transformed into complex cyber-physical systems (SPCs) in the process of mitigating their impact on climate and achieving sustainability, while meeting primary goals such as providing a comfortable, productive, safe and secure environment for occupants and enterprises. These buildings typically encompass systems such as lighting, HVAC (Heating, Ventilation and Air-Conditioning), fire-safety, security etc., that seamlessly interact with business processes and their environment. Smart Buildings (SBs) are an emerging class of built-environment that tightly integrate systems, processes, and environment through Information and Communication Technologies. Integration makes SBs vulnerable to faults and failures (both deliberate and unintentional) that may lead to hazards which would eventually disrupt processes. In the horizon of Smart Buildings and Cities, addressing this open challenge is paramount.

The purpose of this presentation is to present a novel approach to develop a model which will aid risk analysts to identify potential safety hazards latent in integrated SBs. Additionally, it will enable trace their cascaded effects between building systems due to their interoperation, and eventually implement barriers to impede its overall risk. The discussion presented here is a case that argues how do we ensure robust fire protection without compromising smart capabilities of SBs?

The novelty of this approach is thus two-fold. Firstly, it develops a critical understanding of SBs by demystifying ‘what makes buildings smarter? what are their typical capabilities and dimensions?’ and further arguing whether buildings can be treated as CPSs’. Secondly, it presents a diagrammatic representation of SBs that would help risk analysts to apply knowledge from other disciplines namely reliability, risk and robustness. This study is a starting point that shall enable critical analysis of buildings in future, which are otherwise underexamined for unprecedented cyber and physical threats.