

What problems exist in today's building

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Several problems exist in today's building. Mainly, these problems can be described in the aspects including design, construction, operation, occupants and modification.

The building comes from design. It is related to many types of people such as designer, contractor, owner and user. Traditionally, the designer designs the building according to their ideas. The contractors may change the design in some extent to meet their needs. When the construction begins, the on-site construction engineers may change the design again based on their experience. Finally, the owner and users might not be satisfied with some detailed design or even the whole design. This is the lack of communications among these people. Moreover, the designers are also lack of ideas of intelligentizing the building. Normally, there is no communication network for automation control. It is better to install sensors, controllers and their wire system together with the electrical system when the building is under construction.

Some problems existing in a building have to do with the construction. Cracking, spalling, and rain penetration happen sometimes due to the construction technique problems, including lack of the joints and barriers. Evaluation and retrofit should be taken to solve these problems.

Sometimes, the operation is not performed as expected. It might be too hot or too cold in the interior zone. Therefore, the occupants are not satisfied with the indoor conditions such moisture, thermal comfort and indoor air quality. A smart fault-detection on HVAC and MEP systems are required.

All the problems above could be solved by modification which should target on making the building more intelligent. The modification could be hard because of the lack of the future consideration in the initial construction. A new construction or destruction may be needed to install sensors, controllers and wires. Cost is also a consideration of the modification.

All in all, the intelligent building would be a milestone in building design, operation, construction and modification.