HOLISTIC BUILDING PERFORMANCE MODEL WITH SEMANTIC WEB TECHNOLOGIES

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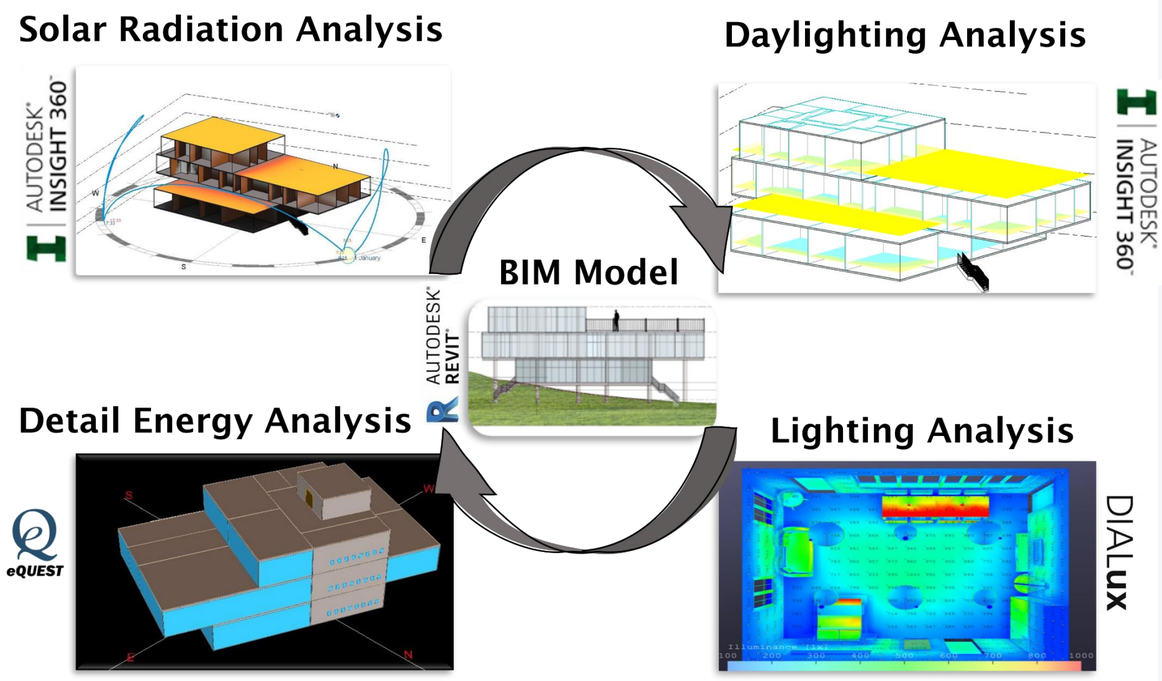
Cloud-based Building Information Modelling

Abstract

The current workflow of building performance modeling is recursive, semi-automated, and has poor interoperability among software and stakeholders due to the paucity of semantic contents and object relationships. Thus, a future workflow is needed in the building performance modeling discipline.

This research focuses on a ***new paradigm*** that consists of ***a holistic ontological framework for building performance*** **modeling** with cloud and semantic web technologies and founded on a knowledge-graph-driven database management system.



Questions

What kind of platform paradigm can represent the whole building performance analysis domain, in a generic intelligent model, as an alternative to the multiple current divergent workflows?

How can this new paradigm automate generation of building performance models and of performance domain analytical models?

Could it automate two-way information exchanges among the generic building model and different building performance simulation tools?

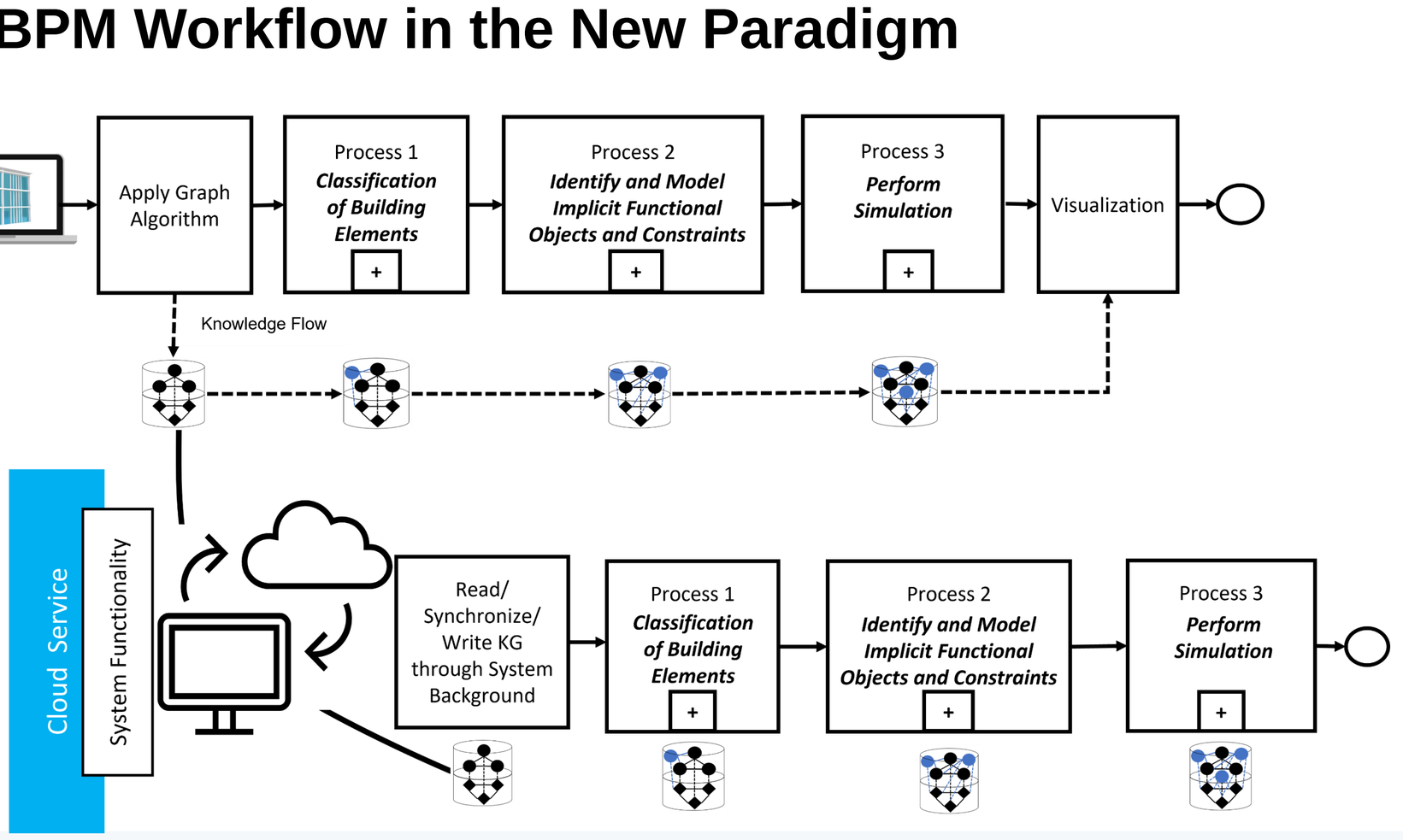
Objectives

The main research objective is to develop, implement, and test a novel paradigm for building performance modeling.

This breaks down into specific targets:

- to create an ontology that can be used as a knowledge database for multiple different performance simulation domains,
- to explore the feasibility of the created ontology with multi-domain performance models.

BPM Workflow in the New Paradigm



The BPM workflow in the novel paradigm suggests a holistic building performance ontology (HBPO) framework containing two semantic enrichment processes (Processes1-2) in cloud-based and knowledge graph-driven databases and management systems.

Contribution

A ***Holistic Building Performance Ontology*** to resolve interoperability problems by considering information about design intent that is essential for creating and managing useful linked data relationships**.**

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