PhD defence

ECOLOGICAL BIM-BASED MODEL CHECKING

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SUMMARY OF THE THESIS
This thesis presents a novel approach to develop BIM-based Model Checking (BMC) systems named Ecological BMC. BMC is a method that makes use of BIM-models to automate a checking process of, e.g., sustainability or building codes rules. Such a method can potentially yield significant results by improving the speed, consistency, and precision of the checking process and results. However, BMC systems have been challenging to develop and use by practitioners due to socio-technical challenges. Attempting to improve BMC-system’s development, the practitioner’s context was investigated through various inquiries to understand better the socio-technical factors relevant to BMC systems use. The findings from the inquiries were used to develop prototypes that were tested with practitioners to evaluate their performance. The insights of the inquiry, prototype development, and evaluation were used to suggest improvements to the practical applicability of BMC systems based on ecological rational perspectives on BMC systems development. An ecological rational perspective means that rationality is not derived deterministically, but more from an ecology, i.e., context of the rationale. To ensure an Ecological BMC-system, it must be situated in the business; its rules formulations based on heuristics; emphasize rules transparency and flexibility, and provide performance tracking.