

Probabilistic Building Life-Cycle Planning as a Strategy for Sustainability

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Abstract : Building Refurbishing and Maintenance is a major area of knowledge ultimately dispensed to user/occupant criteria. The optimization of the service life of a building needs a special background to be assessed as it is one of those concepts that needs proficiency to be implemented. ISO 15686-2 Buildings and constructed assets - Service life planning: Part 2, Service life prediction procedures, states a factorial method based on deterministic data for building components life span. Major consequences result on a deterministic approach because users/occupants are not sensible to understand the end of components life span and so simply act on deterministic periods and so costly and resources consuming solutions do not meet global targets of planet sustainability. The estimation of 2 thousand million conventional buildings in the world, if submitted to a probabilistic method for service life planning rather than a deterministic one provide an immense amount of resources savings. Since 1989 the research team nowadays stating for CEES-Center for Building in Service Studies developed a methodology based on Montecarlo method for probabilistic approach regarding life span of building components, cost and service life care time spans. The research question of this deals with the importance of probabilistic approach of buildings life planning compared with deterministic methods. It is presented the mathematic model developed for buildings probabilistic lifespan approach and experimental data is obtained to be compared with deterministic data. Assuming that buildings lifecycle depends a lot on component replacement this methodology allows to conclude on the global impact of fixed replacements methodologies such as those on result of deterministic models usage. Major conclusions based on conventional buildings estimate are presented and evaluated under a sustainable perspective.

Keywords : building components life cycle, building maintenance, building sustainability, Montecarlo Simulation

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