

Life Cycle Cost Estimation for the Support of Maintenance and Refurbishment of Buildings

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FIGURE 1
eCOSTly methodology framework

FIGURE 2
Application example for an old timber truss

Construction life cycle management is currently a concern of the construction sector, especially in refurbishment and maintenance interventions. Maintenance actions are strategic to assure the buildings' performance within the users and standards requirements. The building design phase and the decisions taken during the rehabilitation of the existent buildings play a crucial role in the determination of the building's life cycle performance in terms of life cycle costs (LCC). For maintenance planning, it is necessary to know the service life of the construction elements and its building LCC. With this goal, the eCOSTLY - evaluate COstructions Service Life for You (Fig. 1) web-based tool was developed, to support the automatic calculation of the estimated service life (ESL) of materials and constructive elements using the factorial method (ISO 15686-1: 2000) based on the design, construction parameters, the environmental conditions and the implemented maintenance type (Fig. 2). Is also able to appraisal maintenance costs over the building life cycle. The main aim of the tool is to support the AECO (architecture, engineering, construction, and operators) sector to take the best option in the moment of the construction of a new building or the rehabilitation of an existent one, based not only in the initial costs but in the annual costs during the building life cycle, including the maintenance and the replacement of the elements, according to its reference service life (RSL). Direct connection with the construction industry will allow to develop and optimize the eCOSTly products database with real and current information, providing construction technicians with a more complete tool. Finally, the tool is being connected with Building Information Modelling software through an application programming interface to automatically perform the ESL and generating maintenance plans. It was concluded that eCOSTly is a useful and innovative tool for buildings' stakeholders.

