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PROPOSTE METODOLOGICHE PER LA PROGETTAZIONE E GESTIONE DEL PATRIMONIO EDILIZIO MEDIANTE STRUMENTI ICT

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Abstract inglese

The research starts from two surveys the first one conducted at national level by CRESME (Center of Social Economic market Research for the Construction and Land) and the other one conducted by NIST (National Institute of Standards and Technology). According to the first study, the 66.4% of the value of the total production of the construction industry will affect in the near future the building restoration - seen as an intervention of ordinary and extraordinary maintenance - and, in an almost indistinct manner, the architectural, structural and plant aspects. Consequently, even because of the current economic crisis, the new construction interventions will be fewer. The second research conducted by NIST comes to the conclusion that in the construction industry the insufficient interoperability costs about two percent of the entire capital invested, quantified as $ 15,824 m. Associating such valuations and considerations to our national reality, the economic losses due to an inadequate interoperability amount approximately to 3000 million euro and basically the amount can only increase considering the different and less efficient Italian legislative and regulatory system. This is due to an outdated legal and regulatory system in building matter, an inadequate level of 'communication' among the actors of the construction industry, the lack or absence of a valid documentary support that is preparatory for the decision phase that anticipates the variant, adjustment or maintenance project. If it is difficult to intervene on the first aspect, more effort is feasible on the other two: to reduce the inefficiency design - in terms of communication - and propose the creation of a documentary database that is easy to read and to access for the technicians and the maintenance technicians would reduce the economic losses previously noticed. Therefore, the aim of the research project is to implement a design methodology to support technicians and maintenance technicians in identifying the starting information necessary for the preparation of maintenance and / or adjustment projects. This implementation involves the use of ICT tools (Information and Communication Technology) such as BIM (Building Information Modeling) for the realization of the database of information and the AR (Augmented Reality) for the real-time display and / or in cloud of the same. Simulating a design workflow based on a case study, it was first verified the level of interoperability between the BIM software used (Revit, ArchiCAD, Robot Structural Analysis) and the proposals for the resolution of 'communication defects'; then it was conducted a preliminary comparison of a seismic analysis conducted comparing the results obtained from BIM software and building software of current usage in Italy. Assessed the reliability of the results obtained, it has enriched the BIM model of the building with more graphic and documentary details: plant design and structural modeling; input of technical cards and alphanumeric data required for the management of the work studied. In conclusion the database visualization has been entrusted to the AR implementing an APP (called InsidAR) for smart devices such as tablets and smartphones in Android environment. It is able to superimpose the virtual model of the building - and its database – to the real environment materializing the “infographic digitization of the property” through the use of the BIM as 'container' of information and the AR as 'display'. A suitable and innovative tool to put in place quickly and without mistakes the management and the maintenance of the buildings, permanently confining to the role of supporting actors the enormous amount of paperwork that is produced today.