PhD in Urban and Regional Development

Research Title: BIM for data management about a new concept of stadium

Funded by	JUVENTUS F.C. spa

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Context of the research activity	The research focuses on engineering aspects related to the application of BIM methodology about: - The development of a stadium BIM model with a predetermined LOD (Level of Detail/Development), based on the definition of WBS (Work Breakdown Structures) and WBE (Work Breakdown Elements). - The Facility Management of the building that allows flexible and immediate spaces optimization, according to the owner needs through data monitoring for the proper use, capacity and occupants of each room. This activity will take place through a series of interoperability tests, improving the interaction with commonly FM software. - The data management of a 3D parametric model for maintenance purposes, with the possibility to organize and schedule mechanical elements, achieving the optimization of the process and the resources. It is also planned to create guidelines for using BIM in the maintenance field, based on international legislation. - The development of a Checklist prototype for events management (control and evaluation of pre-match and post-match furniture damage). - The developing of the “Stadium 2.0” concept, based on the interaction of the external users with the building through integrated Virtual and Augmented Reality applications that allow the provision of interactive information, making the structure “user-friendly” and “innovative”. The idea is to provide a sort of digital dive, developing a 360° virtual highlighting information, possible routes to be followed and the activities offered inside the stadium.

	- Tests concerned MEP modelling and IoT (Internet of Things) assessment with the evaluation of the interaction between the BIM model and the position sensors of internal users (stewart).

Objectives	The aim of this research is to demonstrate the potentialities provided by the BIM methodology application to a complex building that evolves constantly. This goal can be achieved through the research and the development of guidelines for the use of BIM model during the operational step of building lifecycle, to reduce waste of time and costs. These aspects will be closely linked to the Virtual and Augmented Reality activities that will be employed to achieve the owner's defined needs, related to maintenance activities as well as entertainment events. The fulfilment of these objectives will lead to the full development of the integrated building management concept during its lifecycle, allowing it to constantly update, manage daily activities and future interventions, overcoming the actual methodology not based on an integrated alphanumeric model.

Skills and competencies for the development of the activity	Candidates should have knowledge in: • BIM methodological process. • Professional knowledge of BIM software related to design (e.g. Revit, Navsiworks, A360). • Professional knowledge of AutoCAD for analysis existing 2D project data which will be revised. • Database export knowledge and parameter customization. • Database management programs. • AR and VR (e.g. ARmedia, Aurasma) applications with QRcode and benchmark creations. • Benchmarks for the creation of procedural standards (e.g. BIM execution plan).