

BIM Files for 3D Parcel Registration

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SUMMARY

Land Administration is a quite inter-disciplinary field involving experts and knowledge regarding legal aspects, institutional support to establish relationships between involved parties and technical support to realize it. In this context, the role and functional requirements for Land Administration Systems (LAS) have significantly evolved over the last years, also due to the complex built environment and infrastructure density, with land tenures increasingly being created with explicit limits in the third dimension. In this scene, the ISO 19152:2012 Land Administration Domain Model (LADM) - which is currently under revision- can play an active role. (e.g. store legal data in a compliant way).

In parallel, the evolution and application of Building Information Model (BIM) towards integrated sustainable design and dissemination of information is highlighted. BIM has revolutionized the design and construction industry around the world during the last years, while national and governmental BIM councils, roadmaps and even strategies are currently being established in various countries (United Arab Emirates, Ireland, Germany, UK, the Netherlands etc.), a EU BIM Task Group has been established, whilst in some of those countries BIM is already under a government mandate.

The impact of BIM on land administration field is recognized, and it is being seen from governmental perspective as a digital reform and transition that will bring together technology, process improvements and digital information, to radically improve project outcomes and asset operations. One of the strong characteristics of BIM is that it is considered as a strategic enabler for improving decision making and delivery for both buildings and public infrastructure assets across their whole

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lifecycle.

BIM with its IFC (Industry Foundation Class) exchange format, is considered a promising source for semantically enriching spatial data regarding urban land administration, including buildings, apartment rights and infrastructure elements; thus, stimulating the recycle of information through various disciplines. Recent research (Oldfield et al., 2016; Atazadeh, 2017; Atazadeh et al., 2018; Meulmeester, 2019) in the field of land administration also focuses on the use of BIM as input for 3D LAS. Expanding 3D digital Architecture, Engineering and Construction (AEC) models such as BIM/IFC models with 'legal spaces', compulsory with application permits, financing and registration attracts more and more attention.

Given this background, this paper explores the IFC/BIM challenge for 3D parcel creation, while presenting an initial experience with real-world BIM files. A prototype is developed, where BIM models are used as input for 3D parcel registration at a LAS (3D spatial unit in LADM terminology), then stored in an LADM-compliant database (PostgreSQL/PostGIS) and finally, visualized in a web-based prototype using Cesium JS. The objective is to propose a 3D web-based data management and dissemination prototype for apartment rights, using BIM models as source data.

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