

Spatial Representation of the Ownership Structure of Condominium Units

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SUMMARY

The core of administration of cadastres and properties is to explicitly and clearly register the rights, restrictions, and responsibilities (RRRs) of the property (Enemark 2009), where the ownership is the crux of property management. Condominiums are a special type of property with a common or shared ground parcel and considered a kind of compound physical objects bearing various kinds of RRRs. In this study, ownership of a condominium unit is explored from the perspective of the precise management of properties and is subdivided into several sections in terms of right homogeneity, calculations of the legal spatial extent, and other legal treatments. Within the context of the current legal system of China, a 3D model is proposed for presenting the internal structure of ownership by mapping its physical parts (private or common) and their corresponding legal treatments and providing an available method to model such ownership structures by an application domain extension (ADE) of CityGML with the Land Administration Domain Model (LADM). As an indispensable ancillary right of the ownership of condominium units, solar right often refers to whether and how residents can take advantage of the energy (i.e., the light or warmth) of the sun, and these rights have significant economic consequences. A spatial representation of the solar right in terms of sunlight duration is also presented in this study by extending the 3D model of ownership structures and the temporal-spatial feature of solar right is explicitly presented by its data elements who link the legal objects of the property with the corresponding physical objects. The proposed model and representation are verified by examples of a residential building and a building with commercial and community management functions.