

**Legal refinement of the LADM standard: more classes of extended code lists with better defined types of Right, Restrictions and Responsibilities?**

Christiaan Lemmen, Bastiaan van Loenen, Peter van Oosterom, Jesper Paasch, Jenny Paulsson, Hendrik Ploeger, and Jaap Zevenbergen.

The Land Administration Domain Model, LADM, passed on the 1st of November 2012 unanimously the final vote towards becoming an international standard, ISO 19152. Based on the standard this paper explores more detailed classification of interests in land as modelled within LADM's "right", "restriction" and "responsibility" (RRR) classes. The current standardised classification of RRRs in the LADM is restricted to a top-level classification of RRRs. In a number of earlier publications, various options for the legal extension/ refinement were proposed. In Paasch (2012) and Paasch et al (2013b) the LADM is extended with more refined classes based on the paradigm that there are two major types of interest in land: 1. privately agreed interests (LA\_PrivateRight, with subclasses LA\_CommonRight, LA\_PropertyToPropertyRight, LA\_PartyToPropertyRight, and LA\_LatentRight) and 2. regulations imposed by a public agency to further the interests of society (LA\_PublicRight, with subclasses LA\_PublicGeneralRight, and LA\_PublicSpecificRight,). As similar refinement for restrictions and responsibilities was presented resulting in many new (sub)classes. For more detail see the cited publications (and Figure 1 for the LA\_Right refinement). In Hespanha (2013) there is a suggestion in the last section to include 2 more subclasses to LA\_RRR: LA\_CustomaryRight and LA\_InformalRight (apart from LA\_PublicRight and LA\_PrivateRight as explained above). The result is that the number of classes in the model is growing rapidly and as a result systems implementing this will become more complicated.

Is/was it really needed to add more classes to the model? Reasons to have more or different classes is that the instances have different sets of attributes (or association, constraint or operators) involved. It is questionable if this was indeed the case for the extensions mentioned above and in the original papers there were no examples of different attributes for these classes. In the more recent publication (Paasch et al, 2013b) it was explored to use the code list value as available in LADM for a more refined classification of various types of rights LA\_RightType (and same for restrictions and responsibilities). However, in the standard no definitions for the code list values are given and this remains an open task. Options to 'define' code list values are: 1. natural text description, 2. add hierarchical structure to code list values, or 3. develop an ontology of the code list values. For the hierarchical code list values it was proposed that formal right code list values start with 1 (i.e. 1\_formal), and informal code list values start with 2 (2\_informal), etc.. The second number in the code list value is then further refining the actual type; e.g. 1\_1\_ownership, 1\_2\_lease, etc. Note it is still non-trivial to define formally basic concepts such as 'ownership'. In our research we will further investigate these aspects, including the decision when to add new classes (where previous proposals 'correct') and when to extend the code list values. In case of code list it will be further explored what is good approach to define the values.

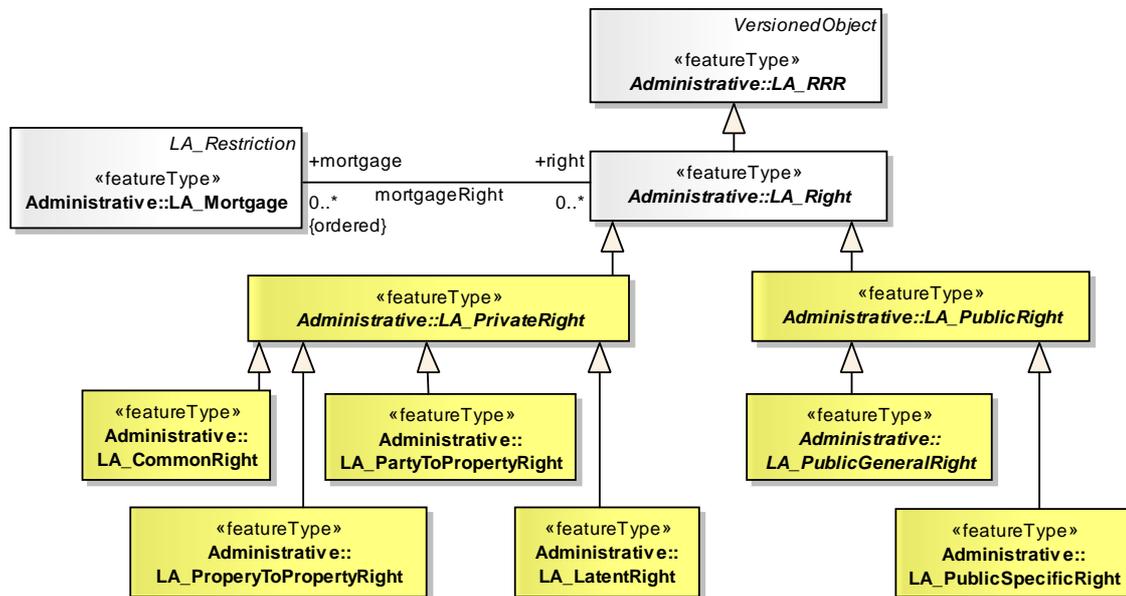


Figure 1. Specialization of the LADM's LA\_Right legal profile. Extended profile for privately and publicly imposed rights.

## References

Hespanha, J.P., Ghawana, T., Lemmen, C.H.J. and Zevenbergen, J.A. (2013). Can LADM contribute to a more fair large scale land acquisition?. In: Proceedings of FIG working week 2013, Abuja, Nigeria, 6-10 May 2013 - Environment for Sustainability.

ISO, (2012). ISO 19152:2012. Geographic information – Land Administration Domain Model (LADM). International Organization for Standardization (ISO). Geneva, Switzerland.

Paasch, J.M. (2012). Standardization of real property rights and public regulations – The Legal Cadastral Domain Model. Doctoral thesis. KTH Royal Institute of Technology. Stockholm, Sweden.

Paasch, J.M., van Oosterom, P.J.M., Lemmen, C.H.J., and Paulsson, J. (2013a), Specialization of the Land Administration Domain Model (LADM) - Modeling of Non-formal RRR. In proceedings of the 5th Land Administration Domain Model Workshop, pages 153-172, 24-25 September 2013, Kuala Lumpur, Malaysia.

Paasch, J.M., van Oosterom, P.J.M., Paulsson, J. and Lemmen, C.H.J., (2013b), Specialization of the Land Administration Domain Model (LADM) - An Option for Expanding the Legal Profiles. FIG Working Week 2013, Environment for Sustainability, Abuja, Nigeria.