



Legal barriers to 3D cadastre implementation: What is the issue?



Serene Ho^{a,*}, Abbas Rajabifard^a, Jantien Stoter^b, Mohsen Kalantari^a

^a Department of Infrastructure Engineering, University of Melbourne, Australia

^b OTB, Delft University of Technology, The Netherlands

ARTICLE INFO

Article history:

Received 8 May 2013

Received in revised form 19 June 2013

Accepted 23 June 2013

Keywords:

3D cadastres
Legal issues
Implementation
Institutional issues
Organisational issues

ABSTRACT

The ways society use and occupy space occur in multiple dimensions; however, the ways we manage and administer space relies on two-dimensional information representations (2D). The legal ambiguity and administrative limitations inherent in such practices are becoming increasingly pronounced within land administration especially for urban areas. In response, a research domain has emerged – termed by specialists as ‘3D Cadastres’ – to seek greater correspondence between the administration of legal land and property (parcel) boundaries and the reality of physical bounds of structures themselves. Within this corpus of literature, advances in the technical domain are evident. However, other areas of research have not experienced the same degree of attention, with a particular lag in analysis of legal issues: this apparently explains the lack of progress in the realisation of operational 3D cadastres. However, given many countries actually already administer ownership of 3D property within current statutory frameworks, is the continued concentration on legal issues a red herring? Are legal issues significant barriers to implementation, and if not, what other considerations are there?

This position paper, comprising two main sections, aims to consider, clarify and reconceptualise the significance of the law as an obstacle to implementation of 3D cadastres. It does this by firstly reviewing the legal issues articulated within the literature and examining the extent of its impact using current practical examples. This leads to the conclusion that finding alternative methods and processes to overcome perceived legal issues actually facilitates progress towards 3D property registration and therefore, 3D cadastre implementation. This challenges the dominant assumption that legal issues are a significant barrier. The paper then proposes to consider the influence of legal issues through an institutional lens, as a way of gaining other insights into how legal issues can influence 3D cadastre implementation. The introduction of institutional theory and a theoretical framework provides a way to reconceptualise the role of legal issues in 3D cadastre implementation. The framework is further used as a sensitising mechanism for discussing broad-based institutional issues that have as yet, not been given significant consideration in the literature. The paper concludes with a response to the main research question and the proposition that significant barriers to 3D cadastre implementation lies not in technological or legal issues, but the more fundamental social and cultural issues that make up the institutional framework underpinning cadastral systems.

© 2013 Elsevier Ltd. All rights reserved.

Introduction

Our use and occupation of space has always had multi-dimensional characteristics – terrestrial (2D), vertical (3D) and temporal (4D). Until recently, the instruments and practices used to manage information about land and property rights, restrictions and responsibilities (RRRs) with multiple dimension attributes rely

on paper plans where only flat projections are possible – be it horizontal or terrestrial boundaries or isometric perspectives of structures. Land administration systems around the world are predicated on a tradition of 2D representation of property boundaries, often with a variety of other property interest information recorded as notations. The limitations of these practices for representing the legal and administrative status of vertically defined properties are now becoming apparent, especially with increasing use of multi-storeyed developments to manage limited space to service population needs (e.g. [Osskó, 2001](#); [Mitrofanova, 2001](#); [Sandberg, 2001](#)).

In response, a research domain known as ‘3D Cadastres’ has emerged. According to the website of the International Federation of Surveyors (FIG) Working Group on 3D Cadastres

* Corresponding author at: Centre for SDIs and Land Administration, Department of Infrastructure Engineering, University of Melbourne, VIC 3010, Australia. Tel.: +61 3 8344 6771.

E-mail addresses: sereneh@unimelb.edu.au, serenesho@gmail.com (S. Ho), abbas.r@unimelb.edu.au (A. Rajabifard), J.E.Stoter@tudelft.nl (J. Stoter), saeidks@unimelb.edu.au (M. Kalantari).

(www.gdmc.nl/3DCadastre/), this research domain is concerned with the “registration of the legal status in complex 3D situations” (FlaG, 2012). In support of this, research efforts have been focused on “legal, institutional and technical aspects”, of which the technical developments have been significant. Over the last decade, initial considerations about design and requirements have progressed to the development of prototype 3D cadastral systems (e.g. Russia, Spain) and a data model (Land Administration Domain Model) recognised as an ISO standard in 2012. In contrast, the non-technical areas of research have lagged behind, predominantly legal and organisational issues (Paulsson and Paasch, 2011). This is despite broad support from the research community that the crux of the 3D cadastre issue is a legal one and not a technical one (Fendel, 2002). The outcomes of the second 3D cadastre workshop in 2011 stated as much, underscoring the primacy of an appropriate legislative framework to underpin 3D cadastral systems:

“if a legal system does not provide the instruments to create 3D property, there is no need for a 3D cadastre at all. On the other hand a 3D Cadastre itself does not make 3D property rights possible” (Banut, 2011, p.3).

However, many countries around the world (e.g. Australia, Sweden, the Netherlands, Singapore) actually have provisions for ownership of 3D property (e.g. Williamson, 2002; Stoter and van Oosterom, 2005; Rajabifard et al., 2012). Yet according to the FIG Working Group on 3D Cadastres, “no country in the world has a true 3D Cadastre, the functionality is always limited in some manner” (FlaG, 2012). The overarching question that this paper will seek to examine is therefore: *what impact do legal issues have in the implementation of a 3D cadastre?*

The paper comprises two main parts: firstly, a review of the legal issues that have so far been raised within 3D cadastre research is analysed in the context of current practices to contest the dominant assumption that legal issues pose a significant barrier to implementation, given evidence in many jurisdictions that demonstrate how current legal frameworks are “stretched” to register 3D properties. Additionally, the continued distinction between legal and institutional issues in the research domain, when legal issues are typically considered as part of a broader institutional framework, has not facilitated a more holistic understanding of the relationship between legislation and stakeholder behaviour, which hinders or enables implementation efforts.

The second part of the paper therefore begins by providing a short theoretical perspective on institutional theory as a precursor to introducing an institutional framework. Institutional theory is concerned with the persistent aspects of social structures, and how these structures (such as routinised behaviour, norms and legislation) come to be regarded as the legitimate or authoritative way to act. Institutional theory has helped researchers in both organisational and technological domains explain issues of both adoption processes and resistance to change. The framework introduced in this paper is used to reconceptualise the role of legal issues, but as well to provide a sensitising mechanism for discussing broader institutional issues that have as yet, not been given significant consideration in the literature. The consideration of these issues through an institutional lens serves not only to build a response to the main research question, but also to validate the proposition that significant barriers to implementation of 3D cadastres lie at the organisational and institutional levels. This provides a starting point for stimulating a broader discussion on the research agenda relevant to institutional aspects of 3D cadastres.

Research standpoint

The definition of a cadastre has long been associated with a function as a repository of land and property-related information

(e.g. the Austro-Hungarian cadastre and the Napoleonic cadastre of the 19th century, whose original functions as tools of survey and census to produce registers of information are still relevant today). Definitions of modern cadastres however, are perhaps more aligned with the content of the information itself and its technological implementation. For example, Fig. 1 (left) below shows the cadastre as a concept comprising individual pieces of information relevant to land and property, and the implementation of this concept is through the use of technology to link, integrate and visualise land and property information.

This paper is written from the perspective that a cadastre is fundamentally a cognitive construct used to administer and manage information about land and property rights, restrictions and responsibilities (RRRs) through a registration process. This process depends on the use of conceptual points and lines to form land and property (land parcel) boundaries. Given the strong cognitive aspect, one of the ways that cadastral information is accorded with the real world is to visualise it in a physical format. The paper therefore takes the standpoint that ‘3D cadastres’ as a concept encompasses primarily the potential evolution of the information required for the registration process of vertically differentiated parcel boundaries, but secondarily, it includes an evolution of the technologies required to support the physical representation of cadastral information in 3D (see Fig. 1 above).

Current cadastral systems and 3D property

In line with one of the fundamental purposes of a cadastre, that is to support tenure security, one of the key outcomes of the working session on legal issues at the first 3D cadastre workshop in 2001 was (Fendel, 2002, p. 4):

The main target, from a legal point of view, is to make these rights certain, and transferable. By doing this we make the multi use of land practical, possible, and attractive to the market.

This primary issue of rights drives the legal mandate, where the objective is to establish and define land and property RRRs unambiguously.

Defining the legal factors

There are several ways the law can affect the legitimacy of 3D property. So far, the literature has mainly concentrated on issues best dichotomised as being addressed at the broad level of public or private law. These include, but are not limited to:

- the concept of a 3D property, its legal status and classification of associated rights (e.g. Stoter and Zevenbergen, 2001; Fendel, 2001; Stoter and van Oosterom, 2005; Paulsson, 2007, 2008; Karki et al., 2010);
- questions raised over the legislative framework required to support autonomous registration of 3D property (e.g. Stoter and Zevenbergen, 2001; Huml, 2001);
- jurisdictional legislative limits and considerations (e.g. Huml, 2001; Sandberg, 2001; Döner et al., 2011; Papaefthymiou et al., 2004; Aien et al., 2011; Tan and Hussin, 2012);
- registration of real property vs. physical objects (e.g. Osskó, 2001);
- effect of public law on private rights (Navratil, 2012); and
- common property regimes (Paulsson, 2012).

Fig. 2 below shows a graphical representation of the legal issues covered so far in the literature and their inter-relationships.

In general, the legal issues identified in the literature appear to be mostly concerned with 3D property legislation. The literature

Download English Version:

<https://daneshyari.com/en/article/93193>

Download Persian Version:

<https://daneshyari.com/article/93193>

[Daneshyari.com](https://daneshyari.com)