

Status of the LADM Standardization Process within ISO/TC211

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SUMMARY

After six years of preparation, the Land Administration Domain Model (LADM) was submitted for standardization in February 2008, by the International Federation of Surveyors (FIG) to the International Organization for Standardization (ISO). This paper presents an overview of the procedural steps and results, that were made in the four years of the standards development process (2008 – 2012), within the ISO Technical Committee 211 for Geographic Information (ISO/TC211).

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1. INTRODUCTION

In this presentation, I will give an overview of the procedural aspects of the standardization process of LADM during the years 2008 – 2012. In this period, we, Christiaan Lemmen, Peter van Oosterom and myself, constituted the ‘editing team’ of LADM, which meant that Christiaan and Peter took the decisions regarding model changes and adjustments, and I documented these changes, in two ways, firstly, in the concept text of the standard, and secondly in a ‘comment log’, because most changes were proposed as official ‘comments’ by the experts, who were members of the LADM project team.

My presentation consists of the following items: the start of LADM (Section 2) and the start of the standardization project (Section 3). Then, the three phases of the standardization process are described: the Committee Draft (Section 4), the Draft International Standard (Section 5), and the Final Draft International Standard (Section 6). There is a discussion in Section 7.

2. THE START OF LADM (2002 – 2006)

The original idea for a land administration standard (LA standard) was launched at the 2002 FIG Congress in Washington D.C. ([Van Oosterom and Lemmen, 2002a](#)). Since then a LA domain model (LADM) was developed incrementally.

Between 2002 and 2006, important mile stones for LADM were:

- in September 2002, version 0.1 was presented at a Technical Committee (TC) meeting of the Open Geospatial Consortium (OGC), organized in Noordwijk, The Netherlands, and in November 2002 at a COST Workshop in Delft, The Netherlands ([Van Oosterom and Lemmen, 2002b](#))
- in March 2003, version 0.2 was presented at a Workshop on Cadastral Data Modeling at ITC (Faculty of Geo-Information Science and Earth Observation of the University of Twente) in Enschede, The Netherlands ([Van Oosterom and Lemmen, 2003](#)), and in April 2003, during the FIG Working Week, in Paris, France
- in September 2003, version 0.3 was presented during Digital Earth, in Brno, Czech Republic ([Lemmen et al, 2003](#)), and at the 2nd Cadastral Congress, held in Krakow, Poland, and in April 2004, at the European Land Information Service (EULIS) Seminar on ‘Land Information Systems and the Real Estate Industry’, Lund, Sweden
- in December 2004, version 0.4 was presented during the Second Workshop on Standardization of the Cadastral Domain, held at the University of Bamberg, Germany ([Van Oosterom et al, 2004](#))
- in April 2005, version 0.5 was presented at the FIG Working Week in Cairo, Egypt ([Lemmen et al, 2005](#))
- in March 2006, version 0.6 was presented at the UN-HABITAT expert group meeting in Moscow, Russian Federation ([Van Oosterom and Lemmen, 2006](#)), and the FIG regional conference in Accra, Ghana, including the third LADM workshop

- finally, in October 2006, version 1.0 was presented at the FIG Congress in Munich, Germany, under the name of ‘version 1.0 of the FIG Core Cadastral Domain Model’ ([Lemmen and Van Oosterom, 2006](#)).

3. THE START OF THE STANDARDIZATION PROJECT (2006 – 2008)

In 2006 and 2007 there had been preliminary discussions between FIG and ISO/TC211 (see below) about standardization of LADM, based on respectively the Cairo and Munich papers. Then, in 2008 the International Federation of Surveyors (FIG) took the initiative to submit a proposal for standardization of LADM version 1.0. The proposal was sent as a New Working Item Proposal (NP) to the Technical Committee for Geographic Information (TC211) of the International Organization for Standardization (ISO). On May 2, 2008, the proposal received a positive vote from the TC211 member countries, and a project team (PT) started to work on the development of the standard. A group of experts from different organizations and international institutions contributed to this development (see Figure 1).



Figure 1. The Project Team in Molde, Norway, 2009.

3.1 FIG

FIG is an international organization representing the interests of surveyors worldwide. It is a federation of the national member associations. FIG was founded in 1878 in Paris and was known as the *Fédération Internationale des Géomètres* (this has become anglicized to the International Federation of Surveyors). It is a UN-recognized non-government organization (NGO), representing more than 120 countries throughout the world (www.fig.net). FIG is a *liaison organization* to ISO/TC211.

3.2 ISO/TC211

ISO/TC211 is one of the more than 200 technical committees of ISO. Its scope is standardization in the field of digital geographic information. TC211 has 34 national standardization organizations as participating members. TC211 has published over 50 standards. Based on the Vienna Agreement between ISO and CEN (the European Committee for Standardization), many standards are published in parallel with CEN.

3.3 ISO/TC211 and supporting organizations

ISO/TC211 works with the support of about 30 liaison organizations, like FIG. While FIG acted as the principal international body in LADM standardization, there was support and commitment from another liaison organization: JRC, the Joint Research Centre of the European Commission. Furthermore, there was also strong participation from UN-HABITAT, the United Nations agency for human settlements.

3.4 ISO and its directive

The standardization process of ISO is regulated in a directive: *ISO/IEC Directives, Part 1. Procedures for the technical work* (ISO, 2012). According to this directive, FIG as a liaison organization of TC211, is entitled to do a proposal for standardization. This is known, in ISO language, as a New Working Item Proposal (NP).

3.5 LADM as NP

A decision upon an NP is done by *voting* by the members of the Technical Committee, within 3 months after the NP was proposed. An NP is accepted when (1) there is a simple majority of the members of the technical committee voting, and (2) a commitment to participate actively in the development of the project by at least five members.

	Yes	No	Participate?	Comments
Australia (SA)	X		N	
Austria (ON)	X		N	
Canada (SCC)	X		Y	
China (SAC)	X		Y	
Czech Republic (CNI)	X		N	
Denmark (DS)	X		N	
Finland (SFS)		X	N	X
Germany (DIN)		X	Y	X
Italy (UNI)	X		N	
Japan (JISC)		X	N	X
Korea, Rep. of (KATS)	X		N	
Netherlands (NEN)		X	Y	X
New Zealand (SNZ)	X		Y	
Norway (SN)		X	N	X
Russian Fed. (GOST R)	X		N	
South Africa (SABS)	X		N	
Spain (AENOR)	X		Y	X
Sweden (SIS)		X	Y	X
Thailand (TISI)	X		Y	
United Kingdom (BSI)	X		Y	X
USA (ANSI)	X		Y	
Totals (P-members only)	15	6	10	(8)

Table 1. The result of voting of LADM as NP.

In Table 1 the result of the voting is summarized. The NP was approved with a majority of 15 over 6, with 10 members willing to participate.

3.6 Negative votes and comments on LADM as NP

According to ISO procedures, members shall provide a statement justifying their positive or negative vote. It is interesting to look at the comments of the negative votes. From Table 1 you see that six members voted negative: five European members (Norway, Finland, Sweden, Germany, and The Netherlands), and Japan.

Firstly, there is a certain contradiction in saying ‘no’ to the NP and at the same time saying ‘yes’ to willing to participate, as was done by three members. E.g. Sweden justifies this behaviour by saying, that when many others are in favour of the NP (in fact, NP’s have never been disapproved in TC211), Sweden is willing to contribute.

Secondly, the justification to vote negative concentrates on the issue whether domain models, that are basically the responsibility of governmental organisations, should be standardized (Germany) and, if so whether in the end standardization violates national legislation (Norway, The Netherlands). This last point caused a thorough discussion on the scope of LADM (scope = the subject and the aspects covered, indicating the limits of applicability).

4. FROM WORKING DRAFT (WD) TO COMMITTEE DRAFT (CD) (May 2008 – November 2009)

The NP was accepted as a (first) Working Draft (WD) for further development, with a total (default) development track of 36 months (three years). See Table 2.

Document	After approval NP	Target date for submission:
as a CD:	12 months	May 2009
as a DIS:	18 months	November 2009
as a FDIS:	30 months	November 2010
as an IS:	36 months	May 2011

Table 2. Default development track LADM.

In Denmark (Copenhagen, May 2008), the PT discussed the first WD, resulting in a second WD, that was discussed in The Netherlands (Delft, September 2008), which resulted in a third WD, that was discussed in Japan (Tsukuba, December 2008, Figure 2). Based on the last meeting, a text for a Committee Draft (CD) was discussed in Norway (Molde, May 2009).

Consequently, in July 2009 a CD was submitted for approval for registration as a DIS. The decision to circulate a DIS is taken on the basis of the *consensus principle*. The definition of consensus by ISO is: “General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments. Consensus need not imply unanimity.”

The outcome of the submission for approval (October 2009) is summarized in Table 3.



Figure 2. The project team at work in Tsukuba, Japan, 2008.

Member body	Approve	Disapprove	Comments
Australia (SA)	X		X
Austria (ON)	X		
Canada (SCC)	X		X
China (SAC)	X		X
Denmark (DS)	X		
Ecuador (INEN)	X		
Finland (SFS)		X	X
France (AFNOR)		X	
Germany (DIN)	X		
Hungary (NSZT)	X		
Japan (JISC)	X		X
Korea, Rep. of (KATS)	X		
Malaysia (DSM)	X		
Morocco (SNIMA)	X		
Netherlands (NEN)	X		
Norway (SN)	X		
Russian Fed. (GOST R)	X		
Saudi Arabia (SASO)	X		
South Africa (SABS)	X		
Spain (AENOR)	X		
Sweden (SIS)	X		X
Switzerland (SNV)		X	
Thailand (TISI)	X		
United Kingdom (BSI)	X		X
USA (ANSI)	X		
Summary Members (25)	22	3	(7)

Table 3. Result of voting CD.

5. FROM COMMITTEE DRAFT (CD) TO DRAFT INTERNATIONAL STANDARD (DIS) (November 2009 – July 2011)

With a comfortable 22 to 3 majority (Table 3) there seemed a ‘general agreement’ to circulate a DIS, and even with no ‘general agreement’, a two-thirds majority might be deemed to be sufficient for the CD to be accepted for registration as a DIS.

5.1 A new meeting in Quebec City

However, every attempt should be made to resolve negative votes. Therefore, with around 300 comments from seven members (see Table 3), and with France and Finland participating in the PT as ‘no-voters’, it was decided to meet again as an Editing Committee (EC), this time in Canada (Quebec City, November 2009). An *editing committee* meets for the purpose of updating and editing a draft, which is accepted for further processing.

5.2 A second text for DIS

As a result of the Quebec discussions, a new (second) text for DIS was submitted in March 2010, as a final text for approval. Written notifications as to why this text should not enter DIS stage had to be submitted no later than April 2010.

And there were objections! Four members, Canada, Finland, France and Japan, all present in the Editing Committee, did not approve for entering DIS stage. “The text for DIS lacked completeness and thoroughness”, was one of the comments. What to do? A second EC review cycle?.

5.3 Resolution 500

In May 2010, ISO/TC211 had their half-yearly plenary meeting in Southampton (UK). Thanks to our Convenor (Antony Cooper, of Working Group 7), it was proposed, in Resolution 500, “to amend ISO/CD19152 in cooperation with the editing committee, to implement the changes required by the comments submitted during the six-week review and make other editorial changes as required”. The resolution was approved, with Finland voting against, and Japan abstaining from voting...

5.4 A third text for DIS

With the execution of Resolution 500, a new phase started, and a big delay in the development track of LADM. The comments had to be resolved and a new (third) text for DIS had to be prepared. A teleconference with the EC was preferred above a (physical) meeting. All in all, about 50 comments were discussed and a new text for DIS was submitted in January 2011, for a 5-month vote.

5.5 Result of voting DIS

The outcome of the voting in June 2011 was very favourable. The DIS was approved, with 26 votes in favour (that is 93%; required > 67%). and two negative votes (that is 7%; required < 25%). See Table 4.

Country	Approve	Disapprove	Comments
Austria	X		
Canada		X	X
China	X		
Czech Republic	X		
Denmark	X		X
Ecuador	X		
Finland		X	X
France	X		X
Germany	X		X
Hungary	X		
Italy	X		
Japan	X		X
Korea, Republic of	X		X
Malaysia	X		
Morocco	X		
Netherlands	X		
New Zealand	X		
Norway	X		
Poland	X		
Portugal	X		
Russian Federation	X		
Saudi Arabia	X		
Serbia	X		
South Africa	X		X
Spain	X		
Sweden	X		X
Thailand	X		
Turkey	X		
United Kingdom	X		
USA	X		X
Member TOTALS	26	2	(10)

Table 4. Result of voting DIS.

While the DIS was approved there was also an avalanche of 400 comments from ten countries!

6. FROM DIS TO FINAL DIS (FDIS) (July 2011 – May 2012)

With this many comments, the editing committee had to be involved again in the processing of the comments. And again, we decided not to call a physical meeting, but to work electronically. We prepared draft observations to the comments, distributed these to the EC members, and got only two reactions back, from Canada and Finland, the ‘no-voters’. The text for FDIS was sent to the ISO/TC211 secretariat in November 2011. The text for FDIS had to be remodeled according to *ISO/IEC Directives, Part 2. Rules for the structure and drafting of International Standards* (ISO, 2011). Therefore, it took some time before it was submitted to the ISO secretariat in May 2012.

The ISO secretariat will distribute the FDIS to all national bodies for a 2 month vote, most probably around July 29, 2012. Effectively, this is the final standard, ISO19152, with exception to spelling and grammatical corrections. On top of the 2 month vote period, there is

a 3 month period for translation and ballot preparation. Assuming a positive response, LADM will be an IS before the end of 2012! This is the situation until now (June 30, 2012).

7. DISCUSSION

The standardization process started after a six year period of preparation (2002-2008; see Section 1). The starting document, LADM version 1.0, as a New Working Item Proposal (NP) got a simple majority in May 2008, with some remarkable negative votes from European countries, and with a development track of 36 months (Section 2). With 36 months, there could have been an International Standard (IS) in May 2011. Why is there still no IS in July 2012?

Let me speculate about two reasons.

Firstly, the editing team (Christiaan Lemmen, Peter van Oosterom and myself) were absolute beginners in the field of ISO standardization. This meant that we did not know the procedures, nor that we knew the rules for the structuring of ISO documents. As an example, simple rules like “annexes shall appear in the order they are referenced in the document” were not applied, which caused extra work and time for the ISO/TC211 secretariat (Bjørnhild Sæterøy, thanks!).

Secondly, we did every attempt to resolve negative votes, with the danger that we “tried to please everybody”, with potential “hazardous” effects, because resolving a comment for one country might result in a next iteration by a “not amused” other country. It is remarkable how the number of comments grew along the development track: from 295 comments for the CD (of which 92% was accepted) to 398 comments for the DIS (of which 86% was accepted). Of course, many comments were relevant. Part of the “booming” of comments was the redundancy of information in text, figures and UML-model.

All in all we had to deal with more than 800 comments, which was, from an editorial point of view, quite cumbersome.

Fortunately, that’s over and done with now. With the coming vote, if a national body votes positively, it may not submit any comments (and if a national body finds the final FDIS unacceptable, it will vote negatively and must state the technical reasons).

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BIOGRAPHICAL NOTE

Harry Uitermark holds a degree in geodesy from Delft University of Technology, The Netherlands, and received a PhD for his research on ‘Ontology-based geographic data set integration’ in 2001 from the University of Twente, The Netherlands. He worked many years with the Dutch Cadastre, and has been a visiting scientist at the Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente.

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