The Systematic Land Verification (SyLVer) Protocol

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INTRODUCTION

Cadastral Database
- parcel based and up-to-date land information database
- includes the geometric descriptions of the land parcels such as location, dimension and size.
- It is linked to other records that describe the nature of interests such as informations related to the rights, restrictions and responsibilities associated to the land parcel.

Cadastral Surveys
- surveys done to determine the metes and bounds of all land parcels within an entire municipality or city and the proponent is the government executed by licensed geodetic engineer (DENR 2007)

Isolated Land Surveys
- surveys of individual or small groups of parcels done to determine the metes and bounds, correct erroneous boundaries and for other purposes and the proponent is either the government or private entities executed by licensed geodetic engineer.
INTRODUCTION

- Philippine Reference System of 1992
- Land Administration and Management Project

UPDATING???

DENR Regional Offices
- digitize cadastral data
- encoding and plotting the coordinates of individual parcels
- scanning and digitizing cadastral maps
- producing a computerized cadastral database

RESEARCH MOTIVATION

- Numerous initiatives done to improve land information system but minimal effort was done to answer the problem of maintaining and updating a cadastral database
- Development of modern geographic information systems (GIS) may help solve the problem of incremental updating of cadastral database
OBJECTIVES

• Determine and evaluate the factors affecting cadastral database’s changing information, provide a way to create and update a cadastral database and provide a way to maintain the historical information.

• Propose a Systematic Land Verification (SyLVer) Protocol that may help agencies such as DENR to do computerized incremental updating while maintaining the topological integrity of a cadastral database.

CADASTRAL DATABASE

<table>
<thead>
<tr>
<th>FIELD NAME</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPI</td>
<td>Unique Parcel Identifier, primary key</td>
<td></td>
</tr>
<tr>
<td>Lot</td>
<td>Lot number</td>
<td></td>
</tr>
<tr>
<td>SurveyNo</td>
<td>Survey number</td>
<td></td>
</tr>
<tr>
<td>Claimant</td>
<td>Claimant or owner</td>
<td></td>
</tr>
<tr>
<td>CMQQuadSec</td>
<td>Cadastral map quadrant where the parcel is located plotted</td>
<td>Applies to cadastral data from Cadastral Maps</td>
</tr>
<tr>
<td>Barangay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality</td>
<td>Municipality</td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td>Province</td>
<td></td>
</tr>
<tr>
<td>Island</td>
<td>Island</td>
<td></td>
</tr>
<tr>
<td>GeodEng</td>
<td>Geodetic Engineer</td>
<td></td>
</tr>
<tr>
<td>dSurveyed</td>
<td>Data Surveyed</td>
<td></td>
</tr>
<tr>
<td>SurSymNo</td>
<td>Sur. Sym. No.</td>
<td>Applies to titled lots only</td>
</tr>
<tr>
<td>LRCNo</td>
<td>LRC Record No.</td>
<td>Applies to titled lots only</td>
</tr>
<tr>
<td>Area</td>
<td>Area of the lot declared on the survey plan</td>
<td></td>
</tr>
</tbody>
</table>

Attributes of the Cadastral Database
CADASTRAL DATABASE

**Types of Survey Based on Survey Symbols**

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Survey Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadastral Survey</td>
<td>Cad</td>
</tr>
<tr>
<td>Original Survey</td>
<td>Psu, RS, Fli, Msi</td>
</tr>
<tr>
<td>Subdivision Survey</td>
<td>Psd, Csd</td>
</tr>
<tr>
<td>Consolidation Survey</td>
<td>Pcn, Ccn</td>
</tr>
<tr>
<td>Consolidation-Subdivision Survey</td>
<td>Pcs, Ccs</td>
</tr>
<tr>
<td>Verification Survey</td>
<td>Vs</td>
</tr>
</tbody>
</table>

*Typical survey symbols based on the type of survey conducted*

CADASTRAL DATABASE INCREMENTAL UPDATING

I. Spatial characteristic- affects the geometry of the parcel

1. Subdivision Survey (segmentation/split)
2. Consolidation Survey (mergence/union)
3. Consolidation-Subdivision Survey (complex change)
4. Verification Survey (boundary adjustment)

II. Attribute characteristic- geometric position does not change
- change in ownership, land classification etc.
CADASTRAL DATABASE INCREMENTAL UPDATING

Change in the characteristic of a lot can be identified by
• topological relationship between the parcels before and after the change
• topological integrity constraints and attribute property (Chen, Zhou and Li 2007).

ARCGIS PARCEL EDITOR

• Parcel Fabric
• Base-map Creation
• Update Layer
• History Layer
PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL

Base Map Creation Flowchart

Procedure for Updating Cadastral Database Map
Subdivision Survey Protocol

Consolidation-Subdivision Survey Protocol

Consolidation Survey Protocol
PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL

Protocol checks for subdivision, consolidation-subdivision, consolidation and verification surveys include the following:

- Checking of the number of lots in the Update Layer;
- Tolerance checking;
- Checking of the number of mother lots in the base-map; and
- Checking of the computed land area of the parcels in the Update Layer and the Base Map Layer


CONCLUSIONS AND RECOMMENDATIONS

• A good parcel updating system is important as it provides user with up-to-date information. Historical data are still relevant as it provides chronological history of parcels that may be needed in several purposes such as investigation.

• The proposed SyLVer protocol may provide a means to do the implementation and updating of cadastral database in a computer environment.

• GIS software can provide an efficient and capable tool in the implementation of cadastral database build-up and incremental updating. ArcGIS provided modules such as the Parcel Editor that can readily be used. However, the cost of buying such third party software must be considered.

• Implementation using actual data is the next level of the study and use of the SyLVer Protocol. This will be done in coordination with DENR.

REFERENCES


• ESRI. ArcGIS Help. 2012.
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THANK YOU for your time and kind attention!!!